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**A Journal  
devoted to  
the Study of  
Indian  
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Editorial communications should continue to be sent to the Editor, *Journal of Indian School of Political Economy*, at the above address. Comments on articles and documentation appearing in the Journal are welcome.

**JOURNAL  
OF INDIAN SCHOOL  
OF POLITICAL ECONOMY**

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Indian Economy, Polity and Society**

**Vol. XXXV**

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University and college teachers and students of Economics, Political Science and Sociology/Social Anthropology are invited to send to us questions of wider interest on the subjects of their study. We shall endeavour to publish in subsequent issues of the journal answers to selected questions received by us. This will form a separate section of the journal. The authors of the selected questions shall receive complimentary copies of one year's issues of the journal, as a token of our appreciation.

## **EDITORIAL**

It is indeed a good feeling to come out with another issue of our Journal especially on time. And more so when we are bringing it (a combined one) out in honour of Professor Nilakantha Rath, one of our esteemed Founder Honorary Fellows, President of the ISPE Council and Managing Editor of the ISPE Journal for more than a decade. His outstanding contribution to policies (both at the Central and State levels) supported by theoretical arguments and empirical analysis has been the hallmark of his intense interest in problems relating to economies all over the world more particularly developing economies. Every student of his (postgraduate as well as doctoral) can vouch for his excellent teaching ability which kept them in awe during his classroom sessions. Humanitarian by nature, he always makes sure that everyone person who meets him returns satisfied with no more lingering doubts.

Personally speaking, I have a lot to say about my interaction with him. At the beginning of my professional and academic career, Prof. Rath was responsible for my entry into Gokhale Institute of Politics and Economics, Pune as a faculty member in the early 1980s, as also into the ISPE as a Honorary Fellow in 2008. And over the past forty years that I have known him, I have had nothing but admiration for his sterling qualities as a human being, as a teacher (I was never a formal student of his but would attend his Price Theory classes time and again to understand theory and practice) and as one who based his economic policy thinking on a solid mixture of theory and practice. From empirical examples to theory and then back to empiricism was his style. In the context of my own research work in transport, he often raised difficult but relevant issues. Disagreements, we had several, but these only led me to more clarity in my thought process rather than confusion which would result from discussions with others including sector specialists. Emphatically, I say that I will always be indebted to him for all the encouragement and

support he has given me in my work (teaching and research). I have much more to say about this outstanding personality but I confine myself to the task at hand to say that I join all of his well-wishers, students and colleagues, in wishing him all the very best in the years to come. We, at the ISPE, are extremely happy to dedicate this combined issue of 2023 (January- December) in his honour. I am sure, dear reader, you will have the same feeling. There are three papers and as usual the documentation part consisting of a selection of his published papers in reputed journals.

S.Sriraman  
August 2023

# SUGARCANE AND SUGAR SECTORS - NEED FOR EFFICIENCY OVER EXPEDIENCY

Sangeeta Shroff & Ramgopal Kundurthi\*

*The Sugarcane and Sugar sectors in the Indian ecosystem is beset with regulatory pricing and controls. This has caused distortions and inefficient resource allocations, thus warranting further sequential interventions. Such interventions serve as short term solutions, and may not necessarily achieve the desired sectoral efficiency. A complete overhaul of the system needs to address the fundamental issue of guaranteed pricing and offtake. A beginning can be made to improve the efficiencies by mandating crop-diversification and initially linking the price incentives to the same. One of the leading sugarcane and sugar producing States like Maharashtra could lead the way for such reforms and could, thus, ideally showcase the benefits of market reforms to other States through such pragmatic policies.*

## Backdrop:

The Indian agricultural sector has systematically underperformed since many decades, despite being a recipient of large subsidies and incentives across the production and market chains. The woes in this sector and the solutions for the same have been well documented and articulated by various researchers, media and policy makers [Balkrishna et. al., 2021; Chand, 2019]. Yet, the agriculture-ecosystem is mired in a myriad of complex regulations with market reforms not really having impacted the sector [Reddy, 2001]. Instead of the dynamism that was required to be infused in the agricultural economy, a system of administered prices and controls continued to follow,

thus bringing about distortions. The sugarcane and sugar economy, are an example in this direction, both plagued with regulatory pricing and controls, not only by the Centre but also by the states. This has caused excess land allocation, excess supply, cost squeeze on sugar mills, thereby warranting further and sequential interventions by the governments. This paper attempts to highlight some of these issues and suggests an urgent need to overhaul the sugar sector. We begin with the status of the sector in recent years.

## Sugarcane and Sugar -Recent Status

Sugarcane is an important commercial crop in India supporting about 50 million farmers (about 34 percent of the farming

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community). The cultivation of sugarcane is however, concentrated only in a few States, viz., Uttar Pradesh, Maharashtra and Karnataka. During the period 2015-16 to 2019-20, Uttar Pradesh accounted for 46.27% of the area under sugarcane cultivation followed by Maharashtra and Karnataka at 18.96% and 8.91%, respectively. Hence, these three States account for three fourth of the area under sugarcane cultivation. The cropping pattern of the three States reveals that the share of sugarcane in the gross cropped area of Uttar Pradesh, Maharashtra and Karnataka is 8.4%, 4.8% and 3.2%, respectively. The production of sugarcane in the recent past has fluctuated from 306.07 million tonnes in 2016-17 to 405.42 million tonnes in 2018-19. With an average recovery rate of 10.88 percent, the production of sugar

has ranged between 20.2 million tonnes in 2016-17 to 33.13 million tonnes in 2018-19 [GOI, 2020].

Sugar manufacturing is an important agro-based industry with 732 installed sugar factories [2023] of which 44.5 percent are in the cooperative sector, 49.5 percent in private sector and 6 percent in public sector. [GOI, 2023] However, all sugar factories that have been installed are not always operational and according to the Indian Sugar Mills Association (ISMA) during the 2020-21 sugar season, 506 sugar mills operated [ISMA, 2023]. About 5 lakh workers are employed in sugar mills, besides indirect employment being generated in the service sector such as transport, servicing of machinery, supply of inputs, etc. Table 1 below gives the production, demand and pricing trends of the sugar and sugarcane economy.

**Table 1. Status of Sugarcane and Sugar Sector in India**

Year	Area Under Sugarcane (Million Hectares)	Production of Sugarcane (Million tonnes)	Yield of Sugarcane (tonnes per hectare)	Production of Sugar (Million tonnes)	Ex-Mill Price of Sugar (Rs per quintal)	Consumption of Sugar (Million tonnes)
2015-16	4.93	348.45	70.72	25.12	3138	24.8
2016-17	4.44	306.07	69.00	20.23	3607	24.4
2017-18	4.74	379.90	79.66	32.20	3179	25.3
2018-19	5.06	405.42	80.11	33.10	3142	25.5
2019-20	4.60	370.50	80.49	27.46	3329	24.9



Source: [CACP, 2020].

It can be observed from Table 1 that the area under sugarcane in India which was 4.93 million hectares in 2015-16, declined to 4.44 million hectares in 2016-17 on account of drought conditions in Maharashtra [Business Standard, 2016]. Water shortage and a drop in the yield of sugarcane caused a sharp decline in production of sugar in Maharashtra from 8.47 million tonnes in 2015-16 to 4.0 million tonnes in 2016-17. The impact was felt at the national level with a fall in sugar production by 19.5 percent and increase in price by 15 percent.

### **Excess Sugar Stocks - The Current Dominant Feature**

After witnessing a fall in 2016-17, there was a steady increase in acreage under sugarcane for the next two years. As a result of the higher acreage as well as improved yields, the production of sugarcane increased by 32% from 2016-17 to 2018-19. However, the scenario was different in 2019-20, as Maharashtra suffered from adverse weather conditions, causing a drop in yield, acreage and production at national level.

The consumption patterns suggest a levelling of around 25 million tonnes of sugar. As a result, when the production keeps above this level, the ex-mill price

tends to fall and vice versa. Despite the fluctuations in the production level caused by the drought as mentioned above and a measure of the cob-web phenomenon in operation [Union Budget, 2019-20, Vol. 2] the overall picture that emerges from the above is the persistent excess supply of sugar after 2016-17. The reasons for such an excess supply can be directly attributed to the pricing and subsidizing policy framework. This is discussed below.

### **Fair and Remunerative Price - the backbone of the sugar economy**

Sugarcane and sugar are both covered by the Essential Commodities Act, 1955. The price of sugarcane is regulated as the Central government fixes the minimum Fair and Remunerative Price (FRP) that sugarcane farmers are guaranteed to receive from sugar mills with an additional payment for recovery higher than the prescribed norm. Many of the State governments have gone a step ahead and fixed a State Advised Price (SAP), which is higher than FRP, perhaps to get political mileage. In Maharashtra, for example, the FRP was Rs 210 per quintal in 2013-14, while SAP was 26% higher at Rs 265 per quintal. In the recent past, States such as Maharashtra and Karnataka have discontinued the practice of

fixing SAP, as the additional payment was creating further distortions and unsustainable for the sugar mills.

Since the price of sugarcane is administered, the sugar mills are required to buy sugarcane from the farmers at this guaranteed price. The selling price of sugar for the sugar mills is however market driven. This adversely impacts the sugar economy through the strained finances of the sugar mills, which are

finally unable to pay the farmers. In order to protect the interests of farmers and also improve the finances of the mills, Government introduced a Minimum Selling Price of Sugar in June 2018. The Minimum Selling Price is fixed after taking into consideration the FRP of sugarcane and the minimum conversion cost of the efficient mills of converting sugarcane into sugar. The Effective FRP and the SAP from 2015-16 to 2019-20 sugar seasons is indicated in Table 2.

**Table 2. Effective FRP and SAP (2015-16 to 2019-20)**

Year	FRP All India	(Rs. Per quintal)							
		Effective FRP				State Advised Price (SAP)			
		Haryana	Punjab	Uttar Pradesh	Uttarakhand	Haryana	Punjab	Uttar Pradesh	Uttarakhand
2015-16	230	230	242	254	230	305	285	280	280
2016-17	230	247	230	248	230	315	290	305	307
2017-18	255	281	261	288	273	325	300	315	316
2018-19	275	284	278	300	300	335	300	315	317
2019-20	275	290	263	313	308	335	300	315	317

Source: [CACP, 2020].

It can be observed from Table 2 that the SAP is higher than FRP for all States considered and for each year. It is interesting to note that the largest producer, Uttar Pradesh, has kept the SAP unchanged for last three years, probably to bring it in line with the FRP. As mentioned above, as the SAPs are higher than the FRP, they generate additional distortions in the sugar economy by straining the financial health of sugar mills which in turn leads to cane price arrears to be paid to the farmers.

It may be mentioned that in addition to the pricing, there are other regulations, such as cane reservation area and bonding according to which every designated mill is obliged to purchase from cane farmers within the cane reservation area, and conversely, the sugarcane farmers are also obliged to sell to that particular mill. The purpose was to ensure a minimum supply of cane to the mill and to provide committed off-take to the farmer at a fixed price. Further, the Central Government also prescribed a minimum

radial distance of 15 kms between any two sugar mills to ensure minimum availability of cane for all mills. There was also a levy sugar obligation according to which every sugar mill mandatorily supplied 10 percent of its production to the Central government at a lower than market price, which then was for supply under the Public Distribution System. This policy of levy sugar has however been discontinued since 2012, and thereafter the supply of subsidized sugar (at Rs 18.50 per kg), was restricted to the most vulnerable section of society with the subsidy provided by the Central Government [GOI, 2023].

### Cost of Production and Returns for Sugarcane:

A cost analysis of sugarcane production reveals that FRP is not just fair but indeed highly remunerative to farmers. Over time, the FRP and SAP have been increasing, unrelated to the consumption and market price patterns of sugar. For example, during the period 2010-11 to

2019-20 the growth rate for ex-mill price of sugar was 2.40% p.a., while the same for FRP was 7.88% p.a. This clearly reveals that while the price paid by mills to sugarcane farmers increased rapidly, the rise in price of sugar did not keep pace but in fact experienced a fall in some years.

In Table 3, the cost of production of sugarcane and the FRP received by sugarcane farmers for the period 2016-17 to 2018-19 is indicated for Uttar Pradesh and Maharashtra which are the top sugarcane producing states. The returns over A2+FL were above 100 % for Uttar Pradesh and ranged between 83 to 94 % in Maharashtra. Further, higher price is paid if recovery is higher and in some cases the states fix SAP which is higher than FRP. For example, in Uttar Pradesh the SAP was Rs 305 per quintal in 2016-17 and Rs 315 per quintal in 2017-18 and 2018-19 which means that SAP ranged about 23 to 33 percent above FRP.

**Table 3. Cost of Production of Sugarcane (Rs Per Quintal)**

Cost/State	Cost A2+FL	Cost C2	FRP	% Returns over A2+FL	% Returns over C2
<b>Uttar Pradesh</b>					
2016-17	93	172	230	147	34
2017-18	119	199	255	114	28
2018-19	135	227	275	107	21
<b>Maharashtra</b>					
2016-17	125	183	230	84	26
2017-18	139	193	255	83	32
2018-19	142	196	275	94	40

*Note: A2+ FL refers to operational costs plus imputed value of Family Labour. C2 refers to A2+FL + Fixed Costs.*  
Source: [CACP, 2020].

### **Pricing Regulations of Sugarcane - Distortions Galore**

Since sugarcane has an assured price and an assured market, farmers benefit by cultivating the crop. This is clearly revealed in the cost of production estimates in Table 3. In addition to the price and offtake assurances, the assured price itself has been increasing, without a linkage to consumption demand or market price of sugar. For example, the FRP for sugarcane increased from Rs 230 per quintal in 2016-17 to Rs 255 per quintal in 2017-18, i.e., an increase of 10%. However, during the corresponding period, the price of sugar declined from Rs 3607 per quintal to Rs 3179 per quintal, i.e., by 11.9 %. This has further backward distortions in terms of the excess acreage allocation, excess fertilizer and water usage and storage of excess stocks. For sugar mills, there is pressure to pay the farmers despite not getting favorable market price. Mills often pledge their sugar to financial institutions to raise working capital which is recovered by selling sugar. The mills are required to make cane payment to farmers within 14 days as per provisions of Sugarcane (Control) Order, 1966. The threat of action by cane commissioners in case of failure to clear FRP dues often induces the mills to try and accelerate sales which causes the prices to dip. Once

the financial position of mills deteriorates, there is pressure on the banking system to waive/restructure the loans.

In view of these distortions, the pricing regulation, while being remunerative to farmers, is neither fair nor remunerative to sugar mills, banking system, government finances or end consumers. An unwarranted serious corollary has been that the area under cultivation has been increasing in direct consequence of the attractive assured returns.

### **Cane Price Arrears to Be Paid to Farmers:**

In view of the distortions as described above, the financial and liquidity position of the sugar mills is not strong. As a result, there is a regular issue of arrears in payment of cane dues. The cane arrears due to farmers at the end of the 2019-20 season is indicated in Table 4. The cane arrears for 2017-18 and earlier period amounted to Rs 2252.06 crores which reduced to Rs 563 crores in 2018-19. However, the season 2019-20 again witnessed a huge increase in arrears to be paid to farmers, to the tune of Rs 10342.13 crores. At the end of the 2018-19 season, the sugar mills had excess stocks and there was also an increase in FRP of sugarcane from Rs 255 per quintal in 2017-18 to Rs 275 per quintal in 2018-19. The Ex-Mill price of

sugar which was Rs 3179 per quintal in 2017-18 declined to Rs 3142 per quintal due to excess of production over consumption. The sugar industry claimed that after considering the cost of a quintal of sugarcane with average recovery of 10.8 percent of sugar, to which is added

conversion costs such as power, chemicals, wages, packaging, overheads, interest on working capital, etc (minus earnings from by-products), the net cost of sugar production would be approximately Rs 3559 per quintal [Business Today, 2018].

**Table 4. Details of Cane Price Arrears (30.09.2020) during 2019-20 and Earlier Seasons in Major States**

State	Arrears (Rs Crore)			
	2019-20	2018-19	2017-18 & earlier	Cumulative
Uttar Pradesh	8468.3	0.0	161.6	8629.9
Gujarat	560.0	24.6	36.9	621.6
Punjab	295.3	12.9	0.0	308.3
Tamil Nadu	213.9	74.1	1548.1	1836.1
Karnataka	195.4	13.8	27.4	236.6
Bihar	146.9	62.1	39.3	248.3
Uttarakhand	145.7	104.7	99.5	349.9
Haryana	131.1	0.0	0.0	131.1
Maharashtra	69.5	221.0	295.3	585.8
Chhattisgarh	57.1	5.8	2.3	65.2
Andhra Pradesh	46.2	36.8	0.3	83.2
Telangana	12.7	5.2	0.0	17.9
Others	0	2.3	41.5	43.7
<b>All India</b>	<b>10342.13</b>	<b>563.30</b>	<b>2252.06</b>	<b>13157.48</b>

Source: [CACP, 2020].

Taking the cost of production of sugar and the prices prevailing, the viability of the sugar mills is fragile due to financial stress on sugar mills. However, due to various measures such as exports, etc, there was considerable reduction in cane price arrears by December 2021 which amounted to Rs 4445 crores. The arrears which were Rs 10342.13 crores for the

2019-20 season declined to Rs 130 cores by December 2021, which indicates that by and large the dues were cleared [GOI, 2021]. Thus, while the problem of cane arrears has been temporarily addressed, the problem of cane arrears to the farmers can easily manifest itself because of the intrinsic pricing pattern.

### Further Interventions:

The issue of excess stocks can be observed from the Sugar Balance Sheet as indicated in Table 5. The production of sugar is in excess of consumption causing excess stocks which are carried forward to the following sugar season. The season 2018-19 witnessed an availability of 43.7 tonnes of sugar while domestic consumption was 24.9 million

tonnes. The Central Government therefore notified a scheme on 15th June 2018, for creation and maintenance of buffer stock of 3 million tonnes by sugar mills for a period of one year with effect from 1st July 2018 [GOI, 2018]. The funds were to be provided to the sugar mills, as reimbursement of the carrying cost for maintaining a buffer stock, and to be used for payment of cane arrears of farmers during the 2017-18 sugar season.

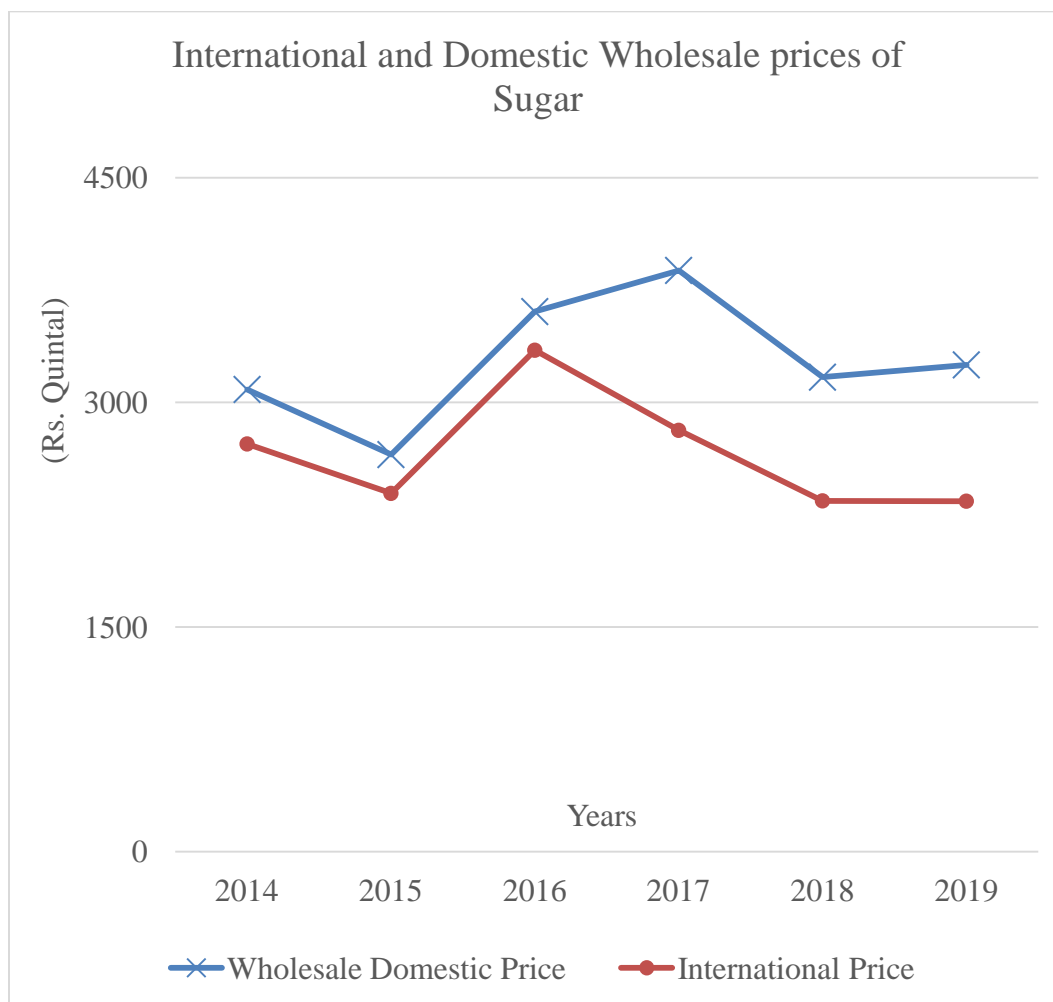
**Table 5. Sugar Balance Sheet (2018-19 to 2020-21)**

Particulars	Quantity (Million tonnes)				
	2017-18	2018-19	2019-20	2020-21	2021-22
Carry - over stocks with sugar mills from Previous season	3.9	10.5	14.5	11	8.5
Production of Sugar	32.4	33.2	27.4	31	30.8
Total availability	36.3	43.7	41.9	42	39.3
Domestic consumption	25.3	25.5	24.9	26.5	27
Total Availability minus Domestic Consumption	11.0	18.2	17	15.5	12.3
Exports	0.6	3.7	5.9	67	5
Estimated Closing stocks at the end of season	10.5	14.5	11	8.5	7.3

Note: For 2021-22, the figures are estimates.  
Source: [GOI, 2021].

The scheme notified that the government would reimburse carrying stocks of Rs 1175 crore to sugar mills for maintaining such buffer stock [GOI, 2018]. A similar situation was observed in 2019-20 with an availability of 41.9 million tonnes of sugar. The government again approved a scheme for creation of buffer stock of 4 million tonnes of sugar

for one year and incur a maximum expenditure of Rs 1674 crores for this purpose. The scheme was implemented with a view to improve the liquidity of sugar mills, reduce stocks with sugar mills, stabilize sugar prices and thus facilitate the clearance of sugarcane price arrears.

**Graph 1. International and Domestic Sugar Prices**

Source: [CACP, 2019].

The Centre also began to fix Minimum Selling Price of sugar and mill wise sale quota to stop distress sale of sugar and also enable the mills to strengthen their liquidity position so as to clear dues of farmers.

#### **Exports: Could they offer a solution**

Other than maintaining buffer stock of sugar in years of excess availability, the government also tried to ease the situation and stabilize the sugar and sugarcane economy by incentivizing exports. The government announced export targets, on 28th September, 2018, through allocation of mill-wise Minimum Indicative Export

Quota of 5 million tonnes. Further, on 5th October, 2018, the Central Government facilitated export of sugar through a scheme for defraying expenditure towards internal transport, freight handling and other charges related to exports [GOI, 2021]. The total expenditure on this account was estimated to be Rs 1375 crores and borne by the government. The assistance was to be used solely for payment of cane price dues of farmers for the sugar season 2018-19 and previous years. This policy measure brought about an increase in exports from 1.7 million tonnes in 2017-18 to 3.7 million tonnes in 2018-19 and further to 5.96 million tonnes in 2019-20. Therefore, it can be observed from Table 4 that cane price arrears which were as high as Rs 2252.06 crores, reduced to Rs 563.30 crores by the end of the 2018-19 season.

Although exports of sugar increased substantially during the period 2018-19 to 2020-21, it is pertinent to note that domestic sugar prices were normally ruling below international prices for extended periods. The same can be observed from Graph 1. From 2017 onwards, the international prices were ruling 26 to 28 percent below domestic wholesale prices. Comfortable stocks in the global scenario, possibly caused the international prices of sugar to be subdued which made exports unviable.

Hence in order to promote exports, schemes were launched through which subsidies were given to sugar mills.

The 2019-20 sugar season witnessed opening stocks of 14.5 million tonnes and in order to deal with this situation, the government announced its approval on 28th August 2019, for providing a lumpsum export subsidy of Rs 10,448 per tonne to sugar mills for the sugar season 2019-20. The total estimated expenditure for this purpose was Rs 6,268 crores. The lumpsum export subsidy was provided for expenses on marketing costs including handling, upgrading and other processing costs, costs of international and internal transport and freight charges on export of upto 6 million metric tonnes of sugar limited to Maximum Admissible Export Quantity allocated to sugar mills for the 2019-20 sugar season. The subsidy was to be directly credited into farmers' accounts on behalf of mills against cane price dues and subsequent balance if any, would be credited to mill's account [PIB, 2019].

As domestic sugar availability was much more than domestic consumption in 2020-21 sugar season also, the Central Government continued to provide assistance of Rs 5800 per tonne for processing cost, internal transport and ocean freight against shipment from Indian ports to the ports of destination countries. The



scheme to provide assistance was announced on 29th December 2020, for export of 6 million tonnes of sugar which entailed an expenditure of Rs 3500 crores for sugar season 2020-21 [PTI, 2020].

Further, on 2nd March, 2019, the Central Government introduced a scheme in order to extend soft loans to sugar mills which would enable them to facilitate their cane dues. According to this scheme, the banks would provide soft loans to sugar mills for the 2018-19 sugar season equivalent to 85 percent of stock value of 4 million tonnes at the rate of Rs 31000 per tonne. The maximum loan that could be advanced under the scheme was Rs 10540 crores. However, only those mills which had cleared at least 25 percent of cane price payable in the 2018-19 season calculated on the basis of the prevailing FRP were considered for soft loans under the scheme [GOI, 2021].

It can be observed from above, that interventions were made by the government, in order to impart stability to sugar mills and hence be in a position to pay the sugarcane farmers. However, these interventions drew the attention of other countries and in 2019, Brazil, Australia and Guatemala requested dispute consultations with India regarding domestic support measures and export subsidies provided by India to producers of sugarcane and sugar.

Accordingly, a panel was constituted by the Dispute Settlement Body of the World Trade Organization in October 2019 to look into the complaints of the three countries. The Panel observed that that for five consecutive sugar seasons from 2014-2015 to 2018-19, India provided non-exempt product-specific domestic support to sugarcane producers in excess of the permitted level of 10 % of the total value of sugarcane production. Hence it was noted that India had not conformed to the obligations of the Agreement of Agriculture. With respect to export subsidies it was claimed by the complainant countries that India provides production, buffer stock, transport, freight and marketing subsidies, operating in conjunction with Minimum Indicative Export Quotas. Further, India incentivizes mills to export sugar during seasons of overproduction by offering to forgo duties on imports in subsequent seasons. Thus sugar mills that exported sugar during the 2017-18 sugar season are entitled to claim Duty Free Import Authorization on imports of raw sugar during the 2019-20 and 2020-21 sugar seasons [WTO, 2021a].

Brazil which is the largest producer of sugarcane in the world and accounting for 40.4 % of world sugarcane production in TE 2018 (followed by India with 18.3 % share) stated that India's longstanding

support measures for sugar have suppressed global prices by about 25 %. Overall it was felt that India's agricultural policies were trade distorting, making markets less predictable and more unstable and in violation of international trade rules. In view of this complaint, India has lost the dispute over subsidies of sugar exports at the World Trade Organization but had made an appeal against the ruling [WTO, 2021b].

In view of the foregoing, it is an extremely difficult task for Indian sugar exports to resolve the issue of excess domestic stocks, except in periods where the negative gap between domestic and international prices narrow.

### **Ethanol Blending Program (EBP) as a Saviour?**

In the recent past, Ethanol Blending Program has been positioned as an important measure to reduce the excess stock position as well as to encourage environment friendly fuel. This would also help the government achieve its 20 % EBP target by 2025. Ethanol has indeed multiple benefits of conserving energy, reducing pollution and support clearance of excess agri-stocks. A scheme was thus notified on 8th March 2019, for extending financial assistance to sugar mills in the form of interest

subventions to sugar mills to augment their ethanol production capacity [GOI, 2021].

The government in order to give incentive to sugar mills, also introduced an Administered Pricing Mechanism for ethanol since 2014-15 with a differential pricing policy wherein higher rates were offered to sugar mills for production of ethanol from B-heavy molasses and sugarcane juice. In other words, the ex-mill price of ethanol from sugarcane juice/sugar/sugar syrup was fixed at Rs 63.45 per litre, from B Molasses at Rs 59.08 per litre and from C Molasses at Rs 46.66 per litre in 2021-22. The price of ethanol produced in India is higher compared to that produced in other countries since the cost of raw materials viz. sugarcane is fixed by the government. While, the price of ethanol in Brazil was USD 0.606 in February 2021, that in India ranged between USD 0.865 and USD 0.63 which means that price of ethanol in India was 4 to 43 percent higher than in Brazil. Further, while petrol is subject to excise duty, GST is levied on ethanol, and hence to promote the Ethanol Blending Programme, there is considerable revenue loss to the government [Niti Aayog, 2021].

While production of ethanol is incentivized to reduce imports of petrol, support the sugar industry from financial

crunch and also reduce pollution, the irony of the situation is that sugarcane is a fertilizer and water-intensive crop. Excessive use of fertilizers and water causes declining soil health and environmental degradation. Further, fertilizers, notably urea is heavily subsidized and this has been a separate fiscal concern for the government. Groundwater resources which are largely used for irrigation are also depleting and electricity too is subsidized in several states. Promoting production of ethanol through sugar cane thus, creates further lop-sided incentives and distortions. This could be one of the reasons for the increase in the acreage for sugarcane production in the recent past. The area under sugar cane production has gone up from 4.60 million hectares in 2019-20 to 5.29 million hectares in 2020-21 and further to 5.45 million hectares in 2021-22. The state of Maharashtra which is water stressed is also experiencing increase in area under sugarcane in 2021-22. The Task force on the Sugarcane and Sugar industry [Niti Aayog, 2020] has also suggested a reduction in the acreage under sugarcane cultivation. It has also recommended reducing supplies by providing sale slip to the extent of 85% of the area of sugarcane farmers, so that they are in a position to diversify the remaining 15 % area to other crops [Niti Aayog, 2020].

It is clear that India must actively seek alternative and eco-friendly sources of energy. However, ethanol through sugarcane has the unfortunate potential of creating additional longer-term issues by using a high cost and eco-unfriendly raw material to generate eco-friendly energy source. Ethanol through maize for instance has a much lower costing than sugarcane. The Expert Committee on the Roadmap to Ethanol Blending in India emphasized the environment cost of ethanol through sugarcane and sugar and recommends "to promote production from non-sugar sources, food grains, especially maize" [Niti Aayog, 2021].

### **Regulatory Capture**

One of the important choices for public policy and Government budgets, particularly in the context of poverty alleviation is the long term vs short term trade-off between capital expenditure and subsidies. "The trade-off between investment in agriculture and increase in subsidies should be an important item on the agenda" [Reddy, 2001]. In a recent study using Time Series models for data between 1980 and 2015, the effect of public investment on total factor productivity in agriculture was observed to be positive, whereas subsidies effected the total factor productivity negatively

for most states [Akber & Paltasingh, 2019]. In contrast, the policy makers often prefer subsidies over capex.

The preference for subsidies and interventions in sugar has been showcased as an important example of regulatory capture, particularly in few states. Shyam J Kamath provides a model to identify the capture and concludes that the "...interlocking between political power and sugar factory ownership has produced the propensity for regulation favorable to the industry" and while there are a number of vested interested parties in the sugar economy, the "producer groups, however, emerge as a powerful and influential group" [Kamath, 1989, Pp. 119-138].

While the origin of the regulations might have been in the best intention to support the vulnerable farmers from a volatile market mechanism and deliver a food security to the fledgling nation, over time the policies have become dogmatic and irreversible. In a study of sugar cooperatives, Lalvani comments that "Persistence of the maze of regulations instituted five decades ago, despite its stated original rationale being thwarted, suggests that it is by active design of entrenched vested interests" [Lalvani, 2008, Pp. 1474-1505]. While attempting to measure the Total Factor Productivity Growth in Indian Agriculture since the

80's, Madhur Gautam observes that such "policies now appear to be having a negative impact through over exploitation and degradation of natural resources, and are skewing farmers' choices away from more income-enhancing crop mixes to low-valued cereal crops" [Gautam, 2016, Pp. 24-27]. It may be added that such choices have other negative impacts such as a burden on the Exchequer.

The electoral politics surrounding the sugar economy has similarly been reported in the media many a time so much so that it is almost accepted as an inevitable part of the democratic process. For instance, an aptly titled editorial of Times of India reads as "Sugar Daddies-The sugarcane economy is miles away from lofty reforms of farm laws. And politics will keep it that way" [ToI-edit, 2021]. And the only consolation is perhaps that other countries as well, seem to witness similar capture, e.g., the USDA Sugar Program [Suresh Babu, 2021].

The issues at hand are summarized in a sequential causal basis as below:

Farmers do get discounted/subsidized inputs including irrigation, power, fertilizers, etc. In addition, for sugar, there is an assured off-take at an assured intervention price that has been steadily going up. The mills who face the market price have a weakened financial position

and, in some cases, become bankrupt; in either case requiring banking system to bail out or restructure. As a further intervention, a minimum selling price is now prescribed which creates yet another pressure group and also robs the consumer of a fair price. In view of the lucrative business model that subsidizes all inputs and guarantees price and off-take, the area under cultivation has been going up, despite consumption demand plateauing off and market prices subdued. In order to make the two ends meet, Government has to further intervene to subsidize exports, which are unsustainable because of the highly competitive international prices and they also attract WTO issues. Lastly, the ethanol blending program which is touted as a solution for excess stocks and also beneficial for the environment, has the potential to create further misallocation of resources through increasing the area under sugarcane cultivation because of the new incentives. In view of the fact that sugarcane is a fertilizer as well as water-intensive crop, it is environmentally counter-productive for the production of ethanol.

It is to be noted that all policies so far, have been framed on how to manage an unsustainable ecosystem created through FRP. The FRP itself has become cast in stone. A solution, often suggested by government as well as researchers, is to

encourage crop diversification. This will promote soil health and perhaps lead to better allocation of resources.

### **Need for Overhaul**

Clearly the sector is in a vicious circle and the situation calls for a major reform process rather than symptomatic treatments and sequential interventions. As said earlier, the cultivation area has to be reduced so that production, consumption and market price are aligned. The productivity has to be significantly increased so as to reap the volume benefits from being a major efficient producer rather than deriving monopolistic profits through a regulatory capture. Crop diversification is a critical step in redirecting the farmers to other non-sugar earnings.

A massive digital and communications exercise should be undertaken by all the governments to educate the farmers on the virtues of market reforms, productivity enhancing measures, crop-diversification and the unsustainability of the current situation. Introduction of Corporates to rural sector can facilitate part of this transformation.

An initial step in this direction would be through a strategic linking of FRP to a mandated crop diversification, the diversification itself being dependent on

state-specific factors. For example, regions in Maharashtra that are prone to drought, need to diversify away from the water-intensive sugarcane to soyabean, pulses, and different types of millet crops. Millets, now termed as 'nutri cereals' were traditionally cultivated in Maharashtra, but the area under these crops has seen a sharp decline. For example, the area under sorghum drastically reduced from 6.5 million hectares in 1982-83 (33% of gross cropped area) to 2.37 million hectares in 2019-20 (10.5% of gross cropped area). In view of their nutritional values and low water consumption, their cultivation is now being promoted.

Ideally, one of the leading states should push through a crop diversification program, if need be, through a set of incentives and a massive digital and communications exercise as mentioned above, with specific targets on sugarcane productivity, enhancing farmer incomes through diversification and modernization of the mills. A success on this front may percolate to other states as well. A related issue is consciously creating productive employment opportunities for the rural sector so that dependence on agriculture is reduced [Panagariya, 2019].

### **Conclusion:**

A major feature of the sugar cane and sugar sector is the persistent excess supply of sugar, arising out of a lucrative FRP mechanism. In order to salvage the situation, a host of sequential policy measures have been adopted by the governments, each of those creating further distortions. Exports are not viable in view of our uncompetitive prices. While ethanol blending *prima facie* offers relief, it does not make sense to use an eco-unfriendly raw material to produce an eco-friendly fuel. Ethanol must be produced through appropriate alternative feed stocks such as crop residue, etc. The real answer therefore lies in discouraging sugarcane cultivation and promoting crop diversification. Overall, efforts must be made by the government to ensure that the price of sugarcane is not administered but more market driven. This will prevent distortions in cropping pattern, prune the fiscal deficit and save water resources and perhaps push agriculture towards becoming more dynamic.

To infuse dynamism in agriculture and to increase farmers' incomes through genuine market process rather than government freebies, a 1991-92 reform moment is sorely needed. One of the states, should take lead and showcase the transformation that can be achieved through market reforms.

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# UNEMPLOYMENT AND WAGES: WHAT DOES NATIONAL SAMPLE SURVEY ORGANISATION (NSSO) DATA REVEAL?

Kiran Pandya\* and Smruti Bulsari\*\*

*Unemployment is largely explained by Classical Economists through movement in wage rates. The objective of this study is to identify the factors, over and above wages, that would have bearing on unemployment. This study is undertaken for India but can be used to draw insights for other countries too. Prima facie, the data on the unemployment rate for different States of India show a wide variation and no clear pattern emerges. Unit-level data of the Periodic Labour Force Survey (PLFS) conducted by the National Sample Survey Organization (NSSO), Government of India, for the year 2019-20 is used to examine the pattern of unemployment and its association with factors other than wage rate. Funnel plot shows that states with higher persons in the labour force tend to have a higher unemployment rate. Funnel plot not only shows exceptionally well and poor performing states but also highlights that quite a few states are outside the funnel boundaries. It further shows that three States are performing exceptionally well, in terms of providing employment, despite a huge labour force and three are performing poorly despite a small labour force. This indicates that regional/individual State characteristics could have a bearing on their unemployment rates. Poisson regression is used to examine the effect of geographical terrain on unemployment rate, holding for the wage rate. Also, the impact of an international border on unemployment rate, holding for wage rates is examined. Both these regional characteristics are examined for their fixed and random-effects. It is found that geographical terrain random-effects influence unemployment rates the most while holding for wage rate. Nagaland is found to have a very high level of unemployment rate and statistically, being an outlier, is not included in the analysis. The reasons for high unemployment rate in Nagaland require to be studied separately.*

**Keywords:** *Unemployment, NSSO, Funnel Charts, Poisson Regression*

**JEL Classification:** *J64, C55, C46*

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## 1 Introduction

Classical economists explain unemployment largely by the movement of wages, where the overall reduction in money wages would result in overall increase in employment [Harrod, 1934, Pp. 19-32; Keynes and Kaldor, 1937, Pp. 743-753; Pigou, 1937, Pp. 405-422]. It was argued that this association between money wages and employment (or unemployment) does not always hold good. The said association is based on a large number of assumptions. Pigou, [1968] argued that economy is complex and therefore, more than one factors influence unemployment. He further cautioned that these multiple factors need not be linearly summable and some factors may be inter-related with each other. Therefore, while specifying the model to explain unemployment, non-linearity in relationships requires to be explored. Besides, simultaneity of interactions among macroeconomic variables may be embedded if required, multicollinearity be examined and regional characteristics be included in the model specification. Solow, [1980, Pp. 1-11] explained how different schools of economic thought have identified additional factors to explain unemployment. The present study focuses on examining the issue in the context of standard classical economics framework, yet attempts to identify

the factors, over and above money wages, that may have a bearing on unemployment.

Betcherman, [2000, S131-S140] empirically demonstrated that different countries have different unemployment rates and this could be because of the differences in the policy interventions in each country. The Segmented Labour Market (SLM) theory also emphasizes the importance of institutional factors in explaining the level of unemployment [Leontaridi, 1998, Pp. 103-109]. It would imply that unemployment rates may vary across the regions within a country because of the differences in implementation of the policy across states. The differences in response to the same policy could also result in regional variations in unemployment. The differences in policy implementation / response to policy could be because of 4 differences in regional factors like geographical terrain, institutional and sociopolitical factors. Besides, climate change also influences the level of unemployment [International Labour Organization, 2018]. The differences in governance at the regional level, wage rates, skills, demographic composition of population, etc., across regions may result in different unemployment rates. Culture and customs also influence labour force participation [Austen, 2000, Pp. 505-521]. Political and legal environment also influences

labour force participation; Saint-Paul [1996, Pp. 263-315] explained this empirically for the European labour market. Thus, there are a plethora of factors that would influence the rate of unemployment, apart from the wage rates.

This study derives insights from [Pigou, 1937; 1968] and Betcherman [2000], to identify the factors, other than wages, that would have bearing on unemployment, over and above wage rate. While this study is based on data of unemployment in India, it can be useful for drawing lessons for other economies.

This paper is organized into five sections: Section 2 describes the methodology and concepts used in the study; the section ends with highlighting the constraints of the data. Section 3 describes the differences in states' efficacy<sup>1</sup> in providing employment, Section 4 presents the results and discussion on the influence of regional characteristics on unemployment rate (while holding for the wage rate), and section 5 summarizes.

## **2 Methodology, Concepts and Constraints**

The present study uses unit<sup>2</sup>-level data of the Periodic Labour Force Survey (PLFS) of the National Sample Survey Organization (NSSO), Government of

India for the year 2019-2020. The sampling design adopted by the NSSO takes all possible care to ensure representativeness of the population characteristics. The methodology and sampling procedure of NSSO is described in detail in [MoSPI, 2016]. The study makes use of unit-level data collected by the NSSO to estimate the number of unemployed persons, the number of persons in labour force and the average wage rate.

### *2.1 Estimations of Persons in Labour Force, Unemployed Persons and Unemployment Rate*

Persons in the labour force are all those who are in the age group of 15 to 59 years and are either already working or searching for work. This study makes use of the current weekly status (CWS) to determine the persons in labour force as well as the number of unemployed persons. NSSO collects data on both CWS and usual activity status. However, one may find a difference in the unemployment rate estimated using each of these definitions. This is because CWS is used to estimate unemployment rate for a period of seven days prior to the date of survey, where as usual activity status is used to estimate the same for a period of one year. A person is "employed" as per the usual activity status, if she / he has been working for 30 days or more in the

entire period of 365 days prior to survey [MoSPI, 2016]. Therefore, the unemployment rate estimated using the usual activity status represents long-term or chronic unemployment. In developing countries like India, there would be more persons working as casual labourers, or are in part-time work, or in contractual / temporary employment. These categories of workers get wages on a daily, weekly or fortnightly basis. It may be noted that type of employment (casual, part-time, contractual / temporary) and the system of payment (monthly / fortnightly / weekly / daily) also impacts the demand for and supply of labour. CWS tries to capture these different types of short-term employment status and therefore, using CWS (*vis-à-vis* the usual activity status) could be more relevant here when examining variations in unemployment rate for India. Moreover, the corresponding data on wages earned on each of these seven days from each of the economic (principal and subsidiary) activities undertaken by these casual labourers are recorded in the PLFS, and the present study examines the association of unemployment rate with wage rate. Therefore, using CWS seems to be appropriate for this study, as compared with the usual activity status.

The first step is therefore, to extract all the data of all those persons who are in the age-group of 15-59 years. The data is

further filtered to extract the data of those whose CWS code is less than 91. This is because MoSPI [2016] specifies that all those engaged in activities with codes 91 to 97 are not to be considered in the labour force. Persons in labour force are then estimated by aggregating (summing up) the number of persons in each state, for each quarter of 2019-20 and unemployed persons are estimated by aggregating (summing up) the number of persons, of each quarter of 2019-20, in each state for whom the CWS code is equal to 81 (the code for unemployed). This gives the quarterly data on the number of persons in labour force and unemployed persons, from the PLFS sample. Yearly estimates of persons in labour force and unemployed persons are obtained by taking the maximum value of all four quarters for each of these parameters.

The rationale for choosing the maximum value is that the factors which explain extreme level of unemployment would also explain the lower levels of unemployment. This has also been cross-verified by doing analysis using the minimum value of unemployment rate and the findings are, more or less, same. Taking average values would possibly iron out the differences in unemployment situation across the states.

The percentage of unemployed persons with respect to the persons in labour force is defined as the unemployment rate.

## *2.2 Estimation of Wage Rates*

As discussed in Section 2.1, PLFS collects data on wages earned from each of the primary as well as secondary activities for the seven days prior to the date of survey, for casual wage labourers. PLFS also collects data on salary of regularly employed persons as well as earnings of self-employed persons. Therefore, a method to arrive at an average wage rate for each state requires to be worked out.

It is important to note that the data on wage rates are available only for those who are employed. In order to extract the wage rates of employed persons, the data for CWS code is greater than 91 (as, these are persons who are not in labour force). After eliminating the data on persons not in labour force, the data for CWS code not equal to 81 is extracted (81 is the code for unemployed). Since the data on employment status is extracted for persons in the age-group of 15-59 years, the data on wage rates is also extracted respectively for all employed persons in the same age-group.

However, earnings of employed persons are collected for different time frames for different categories of employment. To elaborate, the wages of casual labourers are collected for each day for the seven days of the week, prior to the date of survey. The salary of persons in regular employment and income of selfemployed persons is collected for a period of 30 days. Therefore, in order to make the earnings comparable across categories of employed persons, earnings per day is computed. For casual labourers, an arithmetic mean of the earnings over the reference week (from both principal and subsidiary activities) to arrive at their per day wage rate. The income earned by regular salaried employees and by the self-employed persons is divided by 30 (average number of days in a month) to get their per day earnings (now on, referred as wage rate). This is how the unit-level data on earnings per day for all employed persons is worked out.

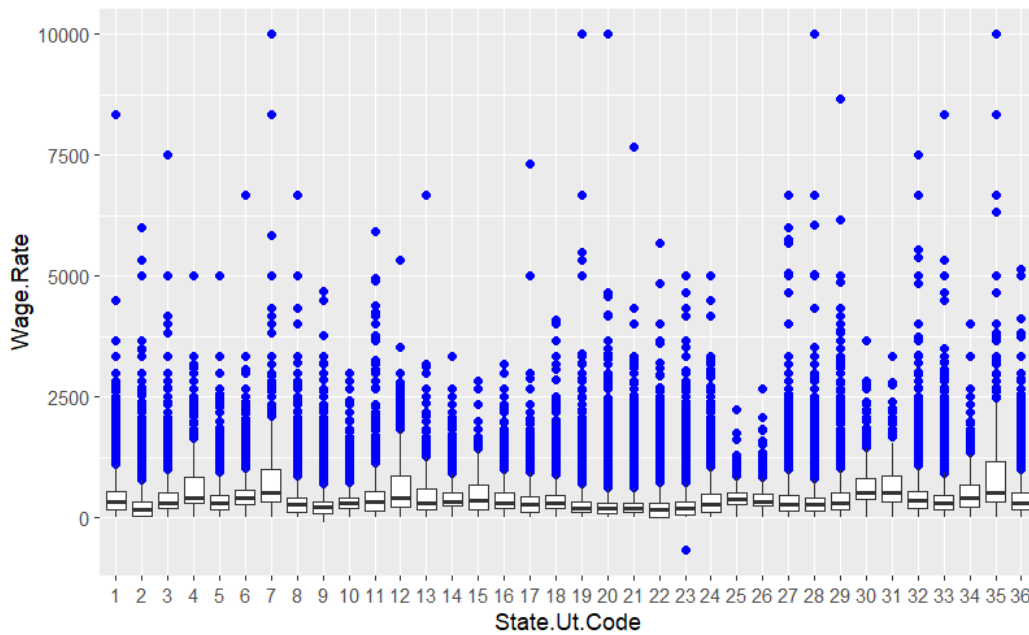
In order to arrive at an unbiased summary measure of earnings per day for each state, stagewise box plots are generated and examined for normality in data. The box plots exhibited a high degree of skewness and a huge proportion of outliers. In the first step, extreme outliers were eliminated. The cases for persons with an earning of Rs 50000 per day were identified as extreme outliers. These cases were removed and the box plot was regenerated. The revised box plots again displayed a huge proportion

of outliers. In this step, all the cases for persons with earnings above Rs 10000 per day were eliminated and a box plot was generated again. The State-wise box plots on per day wages, after eliminating the outliers (persons with wages greater than Rs 10000) is shown in Figure 1 below. The thresholds of Rs 50000 and Rs 10000 are based on the State-wise box plots of per day wages for employed persons, (1) without applying any filters,

and (2) after eliminating cases with per day wage rate is greater than Rs 50000, respectively.

Even after eliminating the outliers, the data on earnings per day exhibits skewness (Figure 1). Therefore, a median of the earnings per day is worked out for each state, and these are referred to as the wage rate for this study.

**Figure 1. Stagewise Box Plots for Wage Rates**



Source: MoSPI [2020] accessed on April 14, 2022 and authors' compilations.

### 2.3 Defining Regional Characteristics

Region specific characteristics often play a very crucial role in promoting economic activities and their types. There are many ways in which regional characteristics can be defined. In the Indian context, it is difficult to have one single way of capturing regional characteristics. One could include language, culture, dietary patterns and much more. However, for this study, we have used geographical terrain (plain or hilly) and whether the State shares an international border to define regional characteristics. The choice of these two regional characteristics is because: the nature of work available in a region is constrained by its geographical terrain. The extent of development, access to social infrastructure (especially, education and health), and the possibility of setting up industries or tertiary services would depend a lot on whether the terrain is hilly or a plain. Access to sea (coastal regions), on the other hand, is an advantage for setting up industries, trade and ports.

Historically too, coastal regions have flourished more in comparison with the land-locked regions. This is largely because of cheaper sea route compared to other routes. Both hilly and coastal regions are suitable for developing tourism. Plains located near coastal areas has an additional advantage of developing industries. In the case of India, the north-eastern hilly regions are largely covered by tall Himalayan ranges, and are inaccessible during some months of the year. Therefore, it is important to examine how the geographical terrain influences the level of unemployment. The categorization by geographical terrain is: states with a coastal belt, plains surrounded by land mass, north eastern and hilly terrain, and distant islands. Andaman and Nicobar Islands, and Lakshadweep are categorized as distant islands. India has 28 States and 8<sup>3</sup> Union Territories<sup>4</sup> (UT). The information on the geographical terrain is based on Google Maps<sup>5</sup> and the categorization of states on the basis of their topographical features is given in Table 1.

**Table 1. States Categorized by Geographical Terrain**

Geographical Terrain	Code	States belonging to each category	No. of States / UTs
States with coastal belt	1	Andhra Pradesh, Dadra & Nagar Haveli, Daman & Diu., Goa, Gujarat, <sup>6</sup> Karnataka, Kerala, Maharashtra, Orissa, Puducherry, Tamilnadu, West Bengal	12
North East and Hilly Terrain	2	Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Sikkim, Tripura, Uttarakhand	10
Plains surrounded by land mass	3	Bihar, Chandigarh Chhattisgarh, Delhi, Haryana, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, <sup>7</sup> Telangana, Uttar Pradesh	11
Distant Islands	4	Andaman and Nicobar Islands, Lakshadweep	2

Source: Google Map of India, accessed on May 2, 2022

States with an international border are likely have an advantage of ease in trade across borders, compared to those without. However, in case of India, a large portion of the international border is experiencing security concerns and a large part of it in the east is covered with high Himalayan ranges. Therefore, the influence of the international border to a state on unemployment also requires to be examined. The information on states sharing an international border is also based on Google Maps. This classification is presented in Table 2.

**Table 2. States with and without International Boarders**

International Border	Code	States belonging to each category	No. of States
States sharing an international border	1	Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Punjab, Rajasthan, Sikkim, Tripura, Uttar Pradesh, Uttarakhand, West Bengal\	16
States not sharing an international border	2	Andaman & Nicobar Islands, Andhra Pradesh, Chandigarh, Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Delhi, Goa, Haryana, Jharkhand, Karnataka, Kerala, Lakshadweep, Madhya Pradesh, Maharashtra, Orissa, Puducherry, Tamilnadu, Telangana	19

Source: Google Map of India, accessed on May 4, 2022



## 2.4 Methodological Constraints

PLFS data are based on the time criteria of unemployment. The focus is on time spent on work. Productivity or income is given little weightage in measuring / estimating unemployment rates by the PLFS. Thus, for the present study, unemployment rates are computed in the context of *time criteria*, out of the four criteria (time, income, willingness and productivity) specified by Krishna, [1973, Pp. 475-484], willingness is implied for all those who are in the labour force.<sup>8</sup>

Hirway, [2002, Pp. 2027-2036] and Kasturi, [2015, 16-19] are critical about the methods and tools used by the NSSO and argue that they are inadequate to capture the data on work in subsistence sector, informal sectors and home-based work. This inadequacy of methods and tools is attributed to the measurement difficulties associated with the said data.

The data are collected quarterly. This has resulted in small sample sizes as compared to the previous quinquennial surveys. However, higher frequency would eventually be useful to examine the time effects on unemployment.

The wage rates used for this study are collected by the PLFS in the form of per day earning received / receivable. Thus,

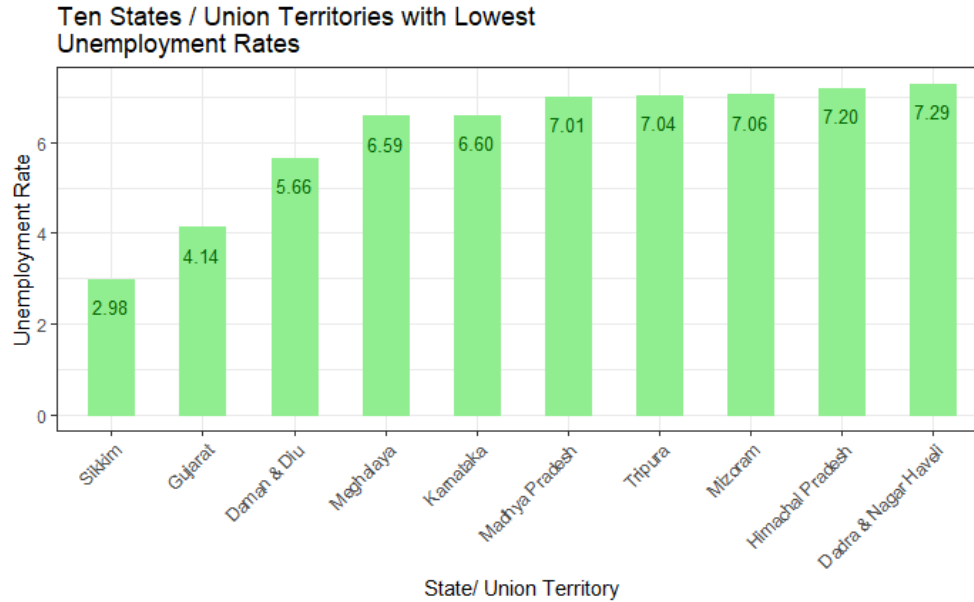
money wages are taken into consideration while examining its influence on unemployment.

## 3 States' Efficacy in Providing Employment

Figure 2 given below shows the ten States / union territories with least unemployment rates in ascending order of the unemployment rates, Figure 3 shows the ones with highest unemployment rates, also arranged in ascending order of unemployment rates. Prima facie look at Figures 2 and 3 reveals a wide variation in unemployment rate across states / union territories of India; Sikkim has the lowest unemployment rate of 2.98 per cent, whereas Nagaland has the highest 29.3 per cent.

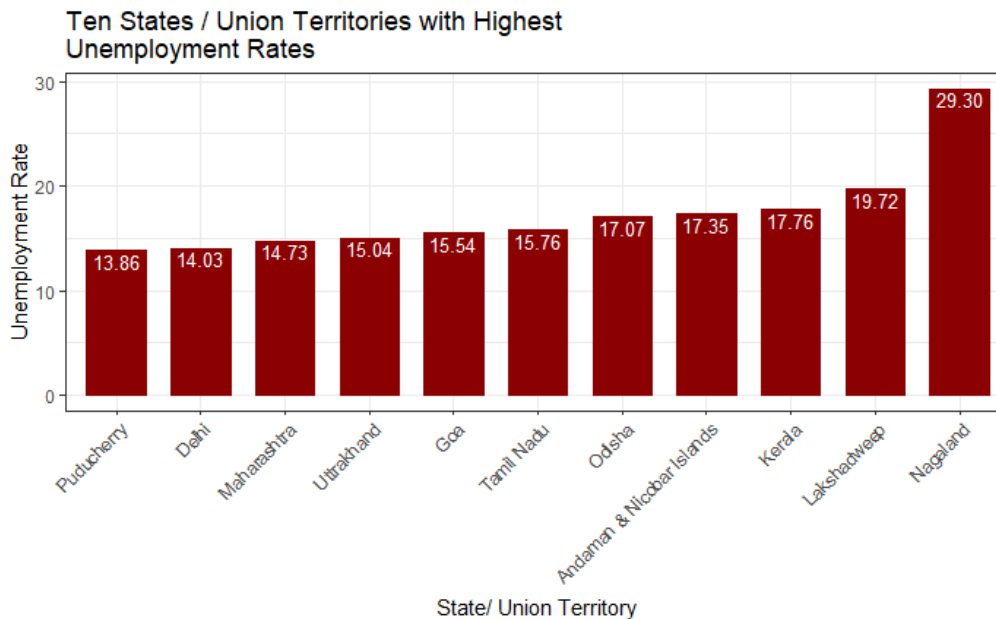
There could be many reasons for this wide dispersion and absence of patterns in unemployment across states: Some states might have limited opportunities because of its geographical terrain or other locational disadvantage, resulting in constrained demand for labour contrary to the others where there is relatively higher demand for labour, resulting in higher employment opportunities. Factors like intra-state migration from demand-deficient states to demand-abundant states would result in increased supply of labour in demand-abundant states. The gaps in skill demand

Figure 2. States / Union Territories with Lowest Unemployment Rates



Source: MoSPI [2020] accessed on April 14, 2022 and authors' compilations.

Figure 3. States / Union Territories with Highest Unemployment Rates



Source: MoSPI [2020] accessed on April 14, 2022 and authors' compilations.

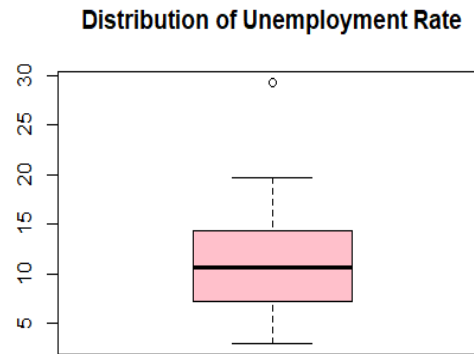
and skill supply would also result in increased unemployment within a given state. States' attitude towards setting up new industrial units or supporting service sector, or promoting entrepreneurship, given its suitability for the same, would also influence the extent of unemployment. All these (and more) aspects determine a state's efficacy in providing employment.

Funnel plots are used to examine the efficacy of States about providing employment. The term "efficacy" is used to explain the extent to which the percentage of unemployed persons (as measured by unemployment rate) is proportional to the persons in labour force. States with higher efficacy would have lower unemployment rate and vice versa. Logically, states with higher number of persons in labour force should have higher unemployment rate and vice versa. Funnel plot provides an idea about this association between unemployment rate and persons in labour force, by visually displaying their relative positions as dots. The states' efficacy in providing employment is defined by the range within which, the dots, depicting the association of unemployment rate with that of persons in labour force, lie. This range is determined by the confidence intervals (the standard practice being 95 per cent and 99.8 per cent).

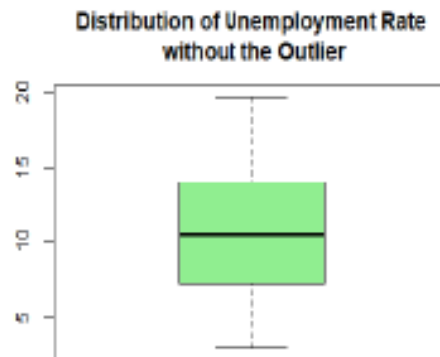
Unemployment rate is also examined with reference to a benchmark value to get further insights on states' efficacy in providing employment.

The benchmark value of unemployment rate is taken as the mean of unemployment rates of all the 35 states / UTs. The unemployment rate of Nagaland based on CWS is 29.30 per cent, exceptionally high. This can be seen as an outlier in the Figure 4 and hence, removed to eliminate its influence on the average. The Figure 5 shows that the distribution is very close to normal and hence arithmetic mean unemployment rate could be defined as a benchmark.

Economic theory provides some basis to estimate the benchmark. Equilibrium unemployment rate estimated using any method could be taken as the benchmark. One of the most commonly used approach is Non-Accelerating Inflation Rate of Unemployment (NAIRU)<sup>9</sup> and it is obtained by differentiating wages over time. Thus, time-series data on wages would be required to estimate NAIRU. There are other implementation issues associated with the use of NAIRU: The cyclical component (boom and bust periods faced by an economy) requires to be separated from the structural component (the characteristics of an economy). The structural component also varies

**Figure 4. Distribution of Unemployment Rate**

Source: MoSPI [2020] accessed on April 14, 2022 and authors' compilations.

**Figure 5. Distribution of Unemployment Rate (after removing the outlier)**

Source: MoSPI [2020] accessed on April 14, 2022 and authors' compilations.

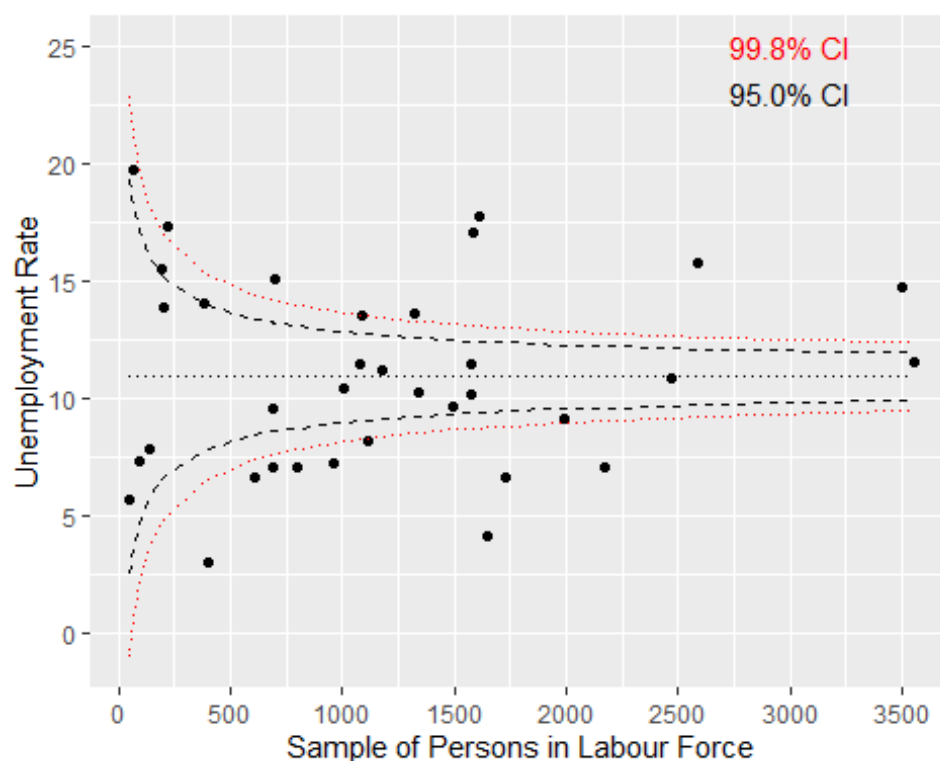
with time. Incorporating changes in NAIKU and demonstrate that using the structural component and including that same data for different time periods / in modelling unemployment is a study in countries generate labour market intervention coefficients with different signs itself. This study makes use of cross-sectional data and hence, use of NAIKU (positive, negative or zero), and even as benchmark is not possible. Also, the statistically insignificant coefficients at times. A modest change in definition of labour market intervention also has the done an extensive review of literature on same implication on its coefficients.

Therefore, in order to ensure simplicity in determining the benchmark unemployment rate, and considering the distribution of unemployment rate, arithmetic mean of unemployment rates across states, except Nagaland's, is taken as the benchmark value.

Figure 6 given below is the Funnel Plot and it gives an overview about the efficacy of the states of India in providing employment. The states for which the

dots are outside the confidence intervals would be termed as low efficacy if the persons in labour force are lower and unemployment rate is higher. This means that the states for which the dots lie on the upper left of the chart are low-efficacy states. On the other hand, the states for which the dots lie on the bottom right of the plot, show lower unemployment rate despite larger number of persons in labour force. These are states with higher efficacy.

**Figure 6. States' Efficacy in Providing Employment: Based on PLFS (Sample) Data**



Source: MoSPI, [2020] accessed on April 14, 2022 and authors' compilations.

Funnel plots are largely used in studies involving health care facilities and schools [Spiegelhalter, 2005, Pp. 1185-1202], though its scope has widened to studies in social sciences recently [Shaw, et. al., 2007]. Funnel plots are improvement over the existing league tables<sup>10</sup> [Goldstein & Spiegelhalter, 1996, Pp. 385-443] and Shewhart Control Charts<sup>11</sup> [Shewhart, 1925, Pp. 546-548].

The high and low efficacy states, along with their unemployment rate and persons in labour force are given in Tables 3 and 4. The reasons for the States to have low efficacy states can be explored by undertaking deeper examination into its causes, whereas the insights derived from states with higher efficacy can be used to enhance the efficacy of other States. Thus, both - lower and higher efficacy States are important from policy prescription perspective.

**Table 3. States with Low Efficacy in Providing Employment: High Unemployment Rate, Small Number of Persons in Labour Force**

Sr. No.	State	Unemployment Rate	Persons in Labour Force
1.	Andaman & Nicobar Islands	17.35	219
2.	Uttarakhand	15.04	698
3.	Assam	13.65	1319

Source: MoSPI, [2020] accessed on April 14, 2022 and authors' compilations.

**Table 4. States with High Efficacy in Providing Employment: Low Unemployment Rate, Large Number of Persons in Labour Force**

Sr. No.	State	Unemployment Rate	Persons in Labour Force
1.	Gujarat	4.14	1644
2.	Karnataka	6.60	1728
3.	Madhya Pradesh	7.01	2169

Source: MoSPI, [2020], accessed on April 14, 2022 and authors' compilations.

The Funnel plot in Figure 6 suggests that an appropriate regression model be developed and used to find the factors influencing the relative efficacy of certain states over the others. Therefore, an exercise is undertaken to examine whether the geographical terrain / international border fixed-effects<sup>12</sup> and random-effects<sup>13</sup> influence unemployment rate, while holding for the wage rate. It is hypothesized from the results of the Funnel plot that regional random-effects are more likely to influence the unemployment rate, holding for the wage rate.

#### *4. Effect of Regional Characteristics on Unemployment Rate*

Unemployment rate is derived from taking a ratio of number of unemployed persons and number of persons in labour force (multiplied with 100). The data on

number of unemployed persons and that of persons in labour force constitute "count data". Poisson distribution is discrete in nature and therefore, appropriate for the count data [Dunn & Smith, 2018]. Poisson probability distribution is expressed as eq (1):

$$P(y;\mu) = \frac{\exp(-\mu)\mu^x}{y!} \quad \dots \text{eq(1)}$$

The generalized linear models for Poisson regression make use of logarithmic link function to estimate  $\mu$ , as shown in eq (2):

$$\log(\mu) = \beta_0 + \sum_{i=1}^p \beta_i X_i \quad \dots \text{eq(2)}$$

where,  $p$  = number of predictors,  $\beta_0$  is the intercept and  $\beta_i$  are the (slope) coefficients of the predictors ( $x_i$ ).

Poisson regression requires the outcome variable to be represented as counts. However, as the study focuses on understanding the impact of wage rate and regional characteristics on unemployment rate, the count of unemployed persons will have to be offset by the number of persons in labour force. Poisson regression provides for offsetting the outcome variable with respect to its population / sample. The offset parameter  $T$  is included in the model,

which is represented in the form of eq (3), which is the Poisson fixed-effects regression model:

$$\log(\mu) = \log(T) + \beta_0 + \sum_{i=1}^p \beta_i X_i \quad \dots \text{eq(3)}$$

where,  $p$  = number of predictors,  $\beta_0$  is the intercept and  $\beta_i$  are the (slope) coefficients of the predictors ( $x_i$ ) and  $T$  is the offset parameter.

In case of the regression model used to examine regional characteristics random-effects, two predictors - geographical terrain and international border (defined in Section 2.3) are used. Poisson random-effects model is thus, mathematically represented as shown in eq (4):

$$\log(\mu) = \log(T) + \beta_0 + \beta_{0u} + \sum_{i=1}^p \beta_i X_i \quad \dots \text{eq(4)}$$

where,  $p$  = number of predictors,  $\beta_0$  is the intercept and  $\beta_i$  are the (slope) coefficients of the predictors ( $x_i$ ),  $T$  is the offset parameter and  $\beta_{0u}$  is the intercept of the random-effects predictor.

Six regression models (see Annexure for Poisson specification) are estimated with natural logarithm of number of unemployed persons, offset by the natural logarithm of persons in labour force. Clark and Linzer, [2014, Pp. 399-408] suggest that when there is no clear reason

to use either of the fixed or random effects models, it is suggested to estimate both and compare the model fit statistics. They also suggest that fixed-effects models are not suitable for out-of-sample forecasts and therefore, one may not be able to estimate the outcome on unobserved values of predictors. Therefore, both fixed-effects and random-effects models are estimated for this study. The estimates of these six regression models are given in Table 5.

**Table 5. Estimates of Regression Models to examine the Influence of State Characteristics on Unemployment**

Dependent: Unemployed persons, Offset: log (persons in labour force) <sup>τ</sup>						
Sr. No.	Regression Models	Wage Rate	Geographical Terrain (Reference category: Coastal)			AIC
			Hilly	Planes	Distant Islands	
1.	Base Model <sup>*ζ</sup>	0.00091 (7.07e-06)		NA		707.81
2.	Base Model with Geographical Terrain as fixed-effect <sup>ζ</sup>	0.00086 (7.30e-05)	-0.2807 (4.84e-12)	-0.2079 (4.19e-10)	0.1725 (0.241)	643.96
3.	Base Model with Geographical Terrain as random-effect <sup>γ</sup>	-0.5619 Conf Int: [-0.9424, -0.1708]	Standard deviation: 38.56			428.66
4.	Base Model with International Border as fixed-effects <sup>ζ</sup>	0.00075 (0.000177)		NA	0.2526 (<2e-16)	636.55
5.	Base Model with International Border as random-effect <sup>γ</sup>	-0.5501 Conf Int: [-0.9380, -0.1495]		NA	Standard deviation: 9.981	429.81
6.	Base Model with Geographical Terrain and International Border as fixed-effects		Near Singular Matrix			

<sup>τ</sup>Models use Poisson regression, which makes use of count data as the dependent variable. Therefore, R-square becomes redundant. Model selection is based on AIC.

<sup>\*</sup> Base Model: Unemployment = f(Wage Rate)

<sup>ζ</sup> Figures in the brackets indicate p-values.

<sup>γ</sup>Random-effects model uses maximum likelihood (ML) method of estimation, unlike the fixed-effects models which are based on minimizing the difference between observed and expected mean squares. In ML, p-values are redundant. However, confidence interval is reported in square brackets.

Source: MoSPI, [2020] accessed on April 14, 2022 and authors' compilations.



The base model (sr. no. 1 in Table 5) is:  
 $\text{Unemployed Persons} = \beta_0 + \beta_1^* \text{wages}$   
 The models specified in sr. no 2 to 6 are:

The second and the third models (sr. nos. 2 and 3 in Table 5) include geographical terrain defined in section 2.3, to the base model, as fixed-effect and random-effect, respectively.

The fourth and the fifth models (sr. nos. 4 and 5 in Table 5) do not include geographical terrain, instead includes international border in the base model as fixed and random-effects, respectively.

The sixth (sr. no. 6 in Table 5) include both geographical terrain as well as international border to the base model, as fixed-effects. Random-effects model with both these variables is not attempted because the fixed-effects model resulted in a near singular matrix. This implies a high correlation between the two - geographical terrain and international border.

All these models are estimated in R; base model and the fixed-effects model are estimated using the glm function of the base module and the random-effects models are estimated using the lmer function of the lme4 package [Bates et al., 2015, Pp. 1-48]. The R code for all these six Poisson regression models is given in the Annexure.

The results of these regression models show that, model 3 (unemployment rate, as a function of wages and random-effects of geographical terrain) has the minimum AIC. Statistically, model 3 is the best fit. Thus, it can be inferred that geographical terrain, as defined in Section 2.3, influences the unemployment rate. The coefficient of wage rate is negative, which implies that decline in nominal wages increases unemployment. This apparently seems to contradict the Pigou's hypothesis that reduction in money wages, other things being equal, would result in increase in demand for labour (reduction in unemployment). However, it would be too early to conclude about the relationship between nominal wages and unemployment for the following reasons:

First, the relationship is examined using Poisson regression and therefore, the outcome variable is unemployed persons and not the unemployment rate (though, an offset of persons in labour force is included in the model). Second, the data are based on the sample survey of only one year. Including time-series of wage rates and unemployed persons / unemployment rate, across the same cross-sections (states) might give different results. Including lagged values of wage rates might give different results. This dataset could have been used to examine the said relationship using

quarterly wage rates and unemployment rates, but it is found that in this year (2019-20), there are hardly any changes quarterly median wages. Therefore, longer time-series data would give insights into lagged effect of wage rates on unemployment.

It may also be noted that the coefficient of wage rate for the base model and fixed-effects model is positive and significant (albeit, close to zero), still in confirmation with Pigou's hypothesis. However, the objective of this study is not to examine Pigou's hypothesis, rather to examine what the influence of regional characteristics on unemployment, while holding for wage rates.

A detailed examination of the both the random-effects models (one with geographical terrain) and the other with international border shows that the standard deviation of geographical terrain random-effect is much higher than that of international border. This implies that geographical terrain has a higher bearing on unemployment as compared to international border.

The fixed-effect models which include both geographical terrain and international border has resulted in a near singular matrix. Apart from implying multicollinearity issue, the standard deviation figures further indicate that the

regional characteristics of states with international border is a subset of the geographical terrain of the states. Therefore, over and above the AIC criteria, these explanations further suggest that the model with geographical terrain as random-effect explains unemployment better compared to the rest of the models of Table 5.

### *5 Summary and Policy Implications*

Classical Economists have tried to explain unemployment in terms of movement in wage rates. Pigou, [1968] however cautioned that it is too simplified to explain unemployment only in terms of changes in wage rates. Betcherman [2000], empirically showed that differences in policy interventions can also cause unemployment to vary across countries. This study is based on Indian data and attempts to identify factors that could influence unemployment, while holding for wage rates. Unit-level PLFS data for the year 2019-20 is used for this study. The data is aggregated to get the maximum unemployment rate and average wage rates for each of the states (including union territories) of India for the year 2019-20. The CWS status is used to estimate the unemployment rate.

The study begins with examining the unemployment patterns across the states

of India and then tries to see the association between unemployment rate and persons in labour force using a Funnel chart. A wide variation in the unemployment rates can be observed by looking at the bar charts of Figures 2 and 3. Funnel plot shows that while, higher unemployment rate is associated with higher labour force participation, it also highlights exceptions, where there are a few states with high unemployment rate despite low labour force participation and vice versa. The results of Funnel plot helped in hypothesizing the role of geographical terrain in explaining the efficacy of states in providing unemployment. However, while examining the geographical terrain, it was found that a large part of the international border constitutes hilly terrain. Therefore, it is also hypothesized that states with and without an international border would also have different unemployment rates.

These hypotheses are examined through six regression models: the base model where unemployment is a function of wage rate. Other models include geographical terrain, international border separately, each as a fixed-effect and as a random-effect, while holding for the wage rate. The sixth regression model includes both geographical terrain and international border as fixed-effects, over and above wage rate, only to realize that

there is a high level of multicollinearity between the two. AIC criteria suggests that the model with geographical terrain specified as a random-effect variable, along with wage rate is the best fit. The high value of standard deviation for geographical terrain random-effect explains its importance in determining unemployment, while holding for wages. A low standard deviation of international border and presence of multicollinearity between geographical terrain and international border shows that the random-effect of international border is captured by the random-effect of geographical terrain.

### *5.1 Policy Implications*

Regional variations in unemployment could be addressed by adopting region-specific policies. India has been proactive in devising policy for hilly regions [Department of Industrial Policy and Promotion, 2018; Government of India, 2008; Press Information Bureau, 2019]. Countries with a long coastline also have their coastal zone development policy like European Union's Integrated Maritime Policy [European Commission, 2007], Common Fisheries Policy [European Commission, 2013], and an Aquaculture Policy [European Commission, 2021] Bangladesh has implemented a Coastal Zone Policy

[Government of the People's Republic of Bangladesh, 2005]. Government is already taking steps towards decentralized planning at district level. But the at present, the hierarchy of planning and implementation of plans is centre, state, district, blocks and villages. An additional layer of region (as classified by) geographical terrain between centre and state could be helpful in integrated development of regions with similar

characteristics. This would have bearing on ironing out and reducing unemployment at regional-level.

It may be noted that the unemployment rate of Nagaland is very high, to be qualified as an outlier and therefore, excluded from the study. The estimates would have been biased, if Nagaland was included in the study. A detailed study of Nagaland is required to be undertaken.

#### Annexure: Poisson Regression Model Specifications in R

**Model 1<sup>14</sup>:** `glm (Unemployed.Persons ~ offset(log(Persons.in.Labour.Force)) + Wage.Rate,`

`data = df, family = "poisson")`

**Model 2:** `glm(Unemployed.Persons ~ offset(log(Persons.in.Labour.Force)) + Wage.Rate + Geog.Terrain,`

`data = df, family = "poisson")`

**Model 3:** `lmer(Unemployed.Persons ~ offset(log(Persons.in.Labour.Force)) + Wage.Rate + (1|Geog.Terrain),`

`data = df)`

**Model 4:** `glm(Unemployed.Persons ~ offset(log(Persons.in.Labour.Force)) + Wage.Rate + International.Border,`

`data = df, family = "poisson")`

**Model 5:** `lmer(Unemployed.Persons ~ offset(log(Persons.in.Labour.Force)) + Wage.Rate + (1|International.Border),`

`data = df)`

**Model 6:** `glm(Unemployed.Persons ~ offset(log(Persons.in.Labour.Force)) + Wage.Rate + Geog.Terrain + International.Border,`

`data = df, family = "poisson")`

df is the data frame object from which the data on different variables are extracted.

## NOTES

1. The word "performance" is used to highlight the importance of State characteristics in determining the level of unemployment, the basic hypothesis of this study.

2. One unit is one household.

3. The Union Territory of Ladakh was formed in October 2019 and therefore; this dataset has 7 Union Territories.

4. The difference between a State and a UT is that a State is a constituent division and has its own governing body whereas a UT is administered by the Central Government.

5. Accessed on May 4, 2022.

6. Gujarat has a desert as well as a coast line. However, Gujarat is the state with the longest coast line among all Indian states and therefore, categorized as "State with coastal belt".

7. Rajasthan also has a desert but the area covered by plains is more compared to that of area covered with desert. Therefore, Rajasthan is categorized as "a plain surrounded by land mass".

8. Willingness to work is the pre-condition for an individual to be in the labour force and being in the labour force is pre-condition to the employment status of that individual.

9 There have been instances of vertical long-run Phillips curve [Modigliani & Papademos, 1975, Pp. 141-165], where the inflation eventually, assumes the value of NAIRU. In other words, NAIRU is the minimum unemployment rate below which the inflation would rise. Thus, the Phillips curve relationship hold true only below this threshold value of unemployment. The Daily Chart of The Economist (2017) have come up with a horizontal relationship between inflation (rise in nominal wages) with unemployment, which further raises a question on the validity of Phillips curve.

10. League tables rank the institutions on the basis of their performance (in descending order of their performance; with highest performing institution ranked first), which can eventually be used to generate a graphical display. League tables are criticized for generating spurious rankings because of the sensitivity of performance indicators to other exogenous factors than what is being measured.

11. Shewhart control charts contain a statistical

measure representing the quality of an entity in consideration, which has mean of that quality parameter as dividing line and standard deviations as control limits. The major limitation of Shewhart control charts is that these charts do not correct of over-dispersion, which is taken care of by funnel charts, which can be confirmed from the shape of the confidence intervals of both the charts.

12. Fixed-effects models hypothesize that unconditional means (intercepts) of the outcome variable (here, unemployed persons) are same across the cross-sectional units (here, states).

13. Random-effects models hypothesize a probability distribution for the cross-sectional unit means (intercepts), implying the extent of variation in the means of cross-sectional units (here, states).

14. These are R-codes and the syntax "log(x)" is used to specify natural logarithm of x. Log to the base 10 is expressed as log10(x) in R.

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# THE FRAMEWORK, INSTRUMENTS AND TRANSMISSION OF MONETARY POLICY IN INDIA

Nishita Raje

*Monetary policy evolves with the financial sector in the economy. The changes to the framework of monetary policy have concomitantly given a rising role to interest rates as an instrument of monetary policy making in India. India's financial sector has evolved significantly during the past few decades and thus the role of interest rates has grown. This paper attempts to trace the story of the co-evolution of the monetary policy framework and monetary policy instruments in India, and examines how this transition from an underdeveloped financial system to a modern one has affected the efficacy of the interest rate as an instrument of monetary policy.*

**Keyword(s):** Monetary policy Frameworks, Instruments, Transmission

**JEL Classification:** E51, E52 and E58

The Framework, Instruments and Transmission of Monetary Policy in India

## I. Introduction

After inheriting a fairly underdeveloped financial system at independence today India's financial sector has developed significantly. Since independence the Reserve Bank of India (RBI), India's central bank, has made sustained efforts to eliminate financial repression and foster a viable competitive financial system. These changes relaxed many underlying constraints and changed some fundamental financial relationships, altering the relative efficacy of the targets and instruments. RBI played a key role of building institutions, strengthening institutional structure, fostering financial

market developments and ushering in financial sector reforms in India. Today, India has the Flexible Inflation Targeting (FIT) framework. In this paper, we attempt to understand this transition from a fairly underdeveloped financial system to a modern sophisticated one.

The monetary policy framework consists of the institutional arrangements under which monetary policies are framed. The framework evolves over time and with financial development that changes the nature of the financial institutions, markets, their depth, integration and the structure of the economy. There is no 'one-size fits all' prescription for a monetary policy framework or institutions that work well in particular countries at a particular stage of development

these do not always suit other countries or may become redundant for the same country at other times. Country specific and periodic assessment of appropriate choice of targets and instruments is required. We look at the nuts and bolts of Indian monetary policy making that has come a long way. The Indian financial system even till the early 1990s was characterised by an administered structure of interest rates with restrictions on various market players, viz., banks, financial institutions, mutual funds and corporate entities. Under the erstwhile administered interest rate regime, the Reserve Bank of India fixed interest rates on both the advances and deposits of commercial banks to ensure they had a reasonable spread. During that period Government securities had artificially low yields and were dependent mainly on a captive market resulting from the statutory liquidity requirement (SLR, applicable to banks). Such an arrangement facilitated the flotation of debt at relatively low interest rates. Moreover, during that era the public sector banks were not focused on profit motive. There were also restrictions on portfolio allocations in the form of specified targets. All these factors culminated in the lack of adequate volumes in the Government bond market, as a result of which the market lacked depth and liquidity till the 1990s. Thereafter, the financial markets, Government securities market and the

efficacy of interest rates has grown phenomenally. This paper attempts to analyse these developments over a period of time. Section 2 gives a brief review of select literature while Section 3 gives the backdrop on the stages of development, framework of monetary policy and choice of instruments in the Indian context. Section 4 discusses the data used and the methodology adopted for the analysis in the paper and Section 5 discusses the empirical results of the study. Finally, Section 6 draws some broad conclusions.

## 2. Review of Literature

The monetary policy framework consists of the institutional arrangements under which monetary policies are framed. Such a framework evolves over time and with financial development that changes financial institutions, markets, their depth, integration and the structure of the economy. Countries decide on their monetary policy framework and instruments according to the development of their financial system, as there are no standardised prescriptions, as monetary policy institutions that work well in particular countries at a particular stage of development do not always suit other countries or even the same country at other times. Given fairly idiosyncratic response of each economy, a country specific analysis and a periodic assessment of appropriate choice of targets and



instruments is periodically required to choose the appropriate framework and set of targets and instruments suitable for it.

Under the intermediate targeting framework, the formulation of monetary policy followed a link wherein the central bank first decided on its *goals* (that are broader in scope, e.g., Price stability), thereafter it translated these goals into tangible *targets*, (e.g., 2.0 percent of the Consumer Price Index). Next, it selected instruments to achieve the operating target (a variable over which the central bank has significant control and helps to attain the primary objective). Thereafter, the central bank decided the *intermediate target* (if any, say 10 per cent growth of money supply), and the *instrument set* to achieve this intermediate target enabling the intermediate step towards achieving its *ultimate target*. In this process once the design of monetary policy was set out, its actual implementation followed the logical link that is exactly in the reverse direction. Here the instruments are adjusted first to achieve the operating target, leading to the attainment of the intermediate target (if any) and through it (or directly) the ultimate objective. Friedman [1975] provided details of how an intermediate target is attained in a two-stage procedure: the first step consists of determination of the value of the intermediate variables, the next requires that the central bank achieves this level

as if it were its objective. The intermediate variable is selected on the strength of the linkages between the intermediate variable and the final variable, the attainment of the intermediate variable will thus lead to the attainment of the output (or price stability) target. A central bank may choose to adopt intermediate targets if it is difficult encountered in aiming at the ultimate goal directly due to existence of information gaps. An intermediate target should be definable and measurable in terms of timely information. Such information provides early feedback to the central bank on the possibility of hitting or missing its ultimate target in terms of its performance at achieving the intermediate target. The controllability of the intermediate objective and its clear linkage with its ultimate objective is the most important pre-requisite for the use of an intermediate-targeting regime. The framework of inflation targeting does not follow such a triad, as the financial liberalisation has changed some fundamental relationships making some intermediate steps optional (redundant).

Financial liberalisation alters the famous triad of instruments-intermediate targets-goals of monetary policy, see Nachane [2001], Nachane and Rajee [2007, Pp. 47-83]. This is because financial liberalisation ushers in a greater role to indirect instruments - like open

market operations this facilitates reduction in use of direct instruments like the reserve requirements and interventionist policies like selective credit controls. Role of the policy rate increases with bank rate or the discount window operations moving from discretionary accommodation to a market-based standing facility. The use of indirect instruments and the development of financial markets co-evolves. The monetary authority has two kinds of instruments, direct and indirect, through which monetary policy can be implemented. This distinction between direct and indirect monetary instruments can operate in two ways: wherein direct instruments 'set' or 'limit' either the prices (interest rates) or quantities (credit, money supply) through regulations. Indirect instruments on the other hand operate through the market by influencing underlying demand and supply conditions. The use of direct measures and instruments involves the use of the regulatory mechanism or stipulations that may impose distortions in the market. The indirect instruments on the other hand work by altering the costs and benefits or incentives to the economic agents. There is enough reason to believe that the use of indirect instruments encourages the development of financial markets just as the greater development of financial markets facilitates the use of

indirect instruments. Indirect instruments rely on market forces and help to "depoliticize" the formulation of monetary and credit policy and the allocation of credit Goodhart [1992, Pp. 216-235]. Alexander, Balino and Enoch [1995] have argued that introduction of indirect instruments may introduce some disintermediation, as demand for bank deposits may be reduced with the availability of greater options for investment in form of treasury or central bank bills as interest-bearing alternatives to bank deposits. Frequent changes in direct instruments are destabilising and disrupt the commercial banks' credit portfolios. Unlike this indirect instruments operate through the market and are amenable to small frequent changes. This quality of indirect instruments enables faster corrections of any divergent trend from the avowed objective trajectory.

The paradigm shift in most economies after liberalisation is known to cause a significant reorientation in the monetary policy framework and its operating procedures. It is a well-accepted fact that after each significant economic change and financial innovation the instruments need to be evaluated as their efficacy may change, Balino and Zamalloa [1997]. However, in highly regulated and underdeveloped financial systems, the only type of instruments that can work

are direct instruments. Indirect instruments can be gradually adopted when the economy starts developing and is gradually deregulated. The arguments in favour of indirect instrument outweigh those in favour of direct instruments. However, in most countries the move towards indirect instruments coincides with greater financial liberalisation. The globalisation and openness are important elements of liberalisation, these ingredients, however, may at times destabilise monetary or credit aggregates for a time and make their control difficult in these phases, McCallum [1989]. The gradual movement towards indirect instruments and phasing out of direct administrative fiat requires greater play of market forces. As pointed out by Balino and Zamalloa [1997], the process of reform has had differential impact over different countries depending upon the nature and design of the financial sector. The reform was aimed at maintaining or improving the authorities' "ability to implement the monetary policy at a minimum resource cost in a changing economic and financial environment".

Here the central bank co-ordinates its instruments of liquidity management, viz., open market operations, discount rate and changes in reserve requirements. The operating procedures may differ as per the intermediate target adopted in the

economy. In operating these instruments, the central banks may choose to affect the intermediate target variables indirectly through changes in the availability and cost of bank reserves. This is a market-based mechanism of adjustment as the central bank undertakes liquidity management to supply or absorb reserves on its own initiative. Central bank addresses reserve shortage/ surpluses of the system, leaving the distribution of reserves to the operation of the money market. This involves greater use of market forces as when the system is short of liquid funds, there is a generalised upward pressure on the interest rates. The central bank may decide to provide liquidity to contain the upward pressure on interest rates. The gyrations in interest rates can be curtailed by avoiding the surge in demand for liquidity or availability of liquid funds. If the central bank decides on an independent liquidity management platform like in India, then an additional tool of liquidity management comes into existence.

The analysis of the change in goals of the monetary authority with financial sector development has showed heterogeneity of the avowed objectives imposed on the central banks has decreased. Central banks have increasingly come to focus on the goal of price stability, that is either set by the central bank itself (as a target) or may be given

to it (as a mandate) by government or an act of the parliament, as under the inflation targeting framework. The policy assignment problem is relevant here. Tinbergen [1956] had discussed the assignment problem, viz., the problem of assigning the instruments to objectives, e.g., incorrect assignment of goals to either the monetary or fiscal policy can result in welfare loss. The view that the number of targets and instruments have to match is slowly losing support as central banks are increasingly using the single instrument of interest rates for attaining multiple objectives like inflation, output and house prices.

Even before the adoption of the inflation targeting framework issue of time in consistency was been discussed in literature. Proponents of rational expectation framework cautioned that surprise inflation can result in some growth gains, but it may also cause a long-term loss of credibility and causes the issue of dynamic inconsistency of low inflation monetary policy. The pros and cons of surprise inflation were discussed at length in Kydland and Prescott [1977, Pp. 473-91] and Barro and Gordon [1983, Pp. 589-610]. In view of the fact that central banks were conservatives, i.e., placed higher weightage on the inflation objective made them more time consistent. Under inflation targeting there has been consensus between the central banks and

the Governments regarding both their policy action and final objectives. In practice however, 'Constructive Ambiguity' was considered to be a virtue globally. Prominent central bankers like Greenspan were not exactly known for clarity in their language. Nevertheless, researchers and prominently theory outlined by rational expectation school proclaimed that no policy can be successful over a period by not providing information to the economic agents. Credibility of the monetary policy plays a crucial part in its efficacy. In this context, one may differentiate between genuine uncertainties about the future *vis-à-vis* not revealing the expected outcome of the policy. After countries like the UK, New Zealand and Australia successfully adopted inflation targeting in the 1990s, there was a secular movement towards this framework in countries across the development spectrum and has resulted in an improvement in transparency of monetary policies across the world.

### **3. The Stage of Development, Framework of Monetary Policy and Instrument choice**

3.1 In this section we move to the conduct of monetary policy in India. RBI had a key role in strengthening the institutional structure and fostering financial market development in India. Financial sector

reform in India was at the central bank's initiative. The RBI made sustained efforts to eliminate financial repression and foster a viable competitive financial system. These changes relaxed many underlying constraints and changed some fundamental financial relationships, altering the relative efficacy of the targets and instruments. Today, India has a Flexible Inflation Targeting framework. We now turn to an examination of how this transition from an underdeveloped financial system to a modern one has affected the efficacy of the interest rate as an instrument of monetary policy.

The preamble to the Reserve Bank of India Act, 1934 sets out the objectives of the Bank as "to regulate the issue of bank notes and the keeping of reserves with a view to securing monetary stability in India and generally to operate the currency and credit system of the country to its advantage". When the Flexible Inflation Targeting Framework was adopted in 2016 the following addition to this was made "To have a modern monetary policy framework to meet the challenge of an increasingly complex economy; to maintain price stability while keeping in mind the objective of growth." (Reserve Bank of India Act)

Thereafter, there was a clear explicit mandate for price stability, that was set at 4% +/- 2 % by the Government of India.

The target was firstly set for the period August 5, 2016 to March 31, 2021, and thereafter reiterated after a detailed review in 2021.<sup>1</sup> Before this the objectives of monetary policy in India were stated as those of maintaining price stability and ensuring adequate flow of credit to the productive sectors of the economy. In essence, monetary policy aims to maintain a judicious balance between price stability and economic growth. Wherein the relative emphasis between price stability and economic growth is governed by the prevailing circumstances in a particular time and is spelt out from time to time in the policy announcements of the Reserve Bank.

Financial liberalisation in the Indian context has increased the efficacy of instruments used and made it feasible to shift towards market-oriented instruments. Increased integration of the financial markets and their depth has greatly changed the operating procedures of monetary policy in India. Over the years RBI provided the impetus to progressive deregulation, integration of the financial system and it has periodically proactively changed its monetary policy framework. Today monetary policy making in India compares favorably with mainstream trends in the developed countries. This section looks at how instruments use has evolved over the years. The kind of instruments that can

be used at different stages of development vary significantly. We can classify the instrument used in India during different phases as follows:

**Table 1. Instrument Use according to Phases of Development of the Financial Sector**

Underdeveloped Stage 1950-1985	Expansionary Stage Monetary Targeting 1985-1998	Developing Stage Multiple Indicator Approach 1998-2015	Developed Stage Flexible Inflation Targeting 2016 onwards
Selective Credit Control Subsidised directed credit Refinances Reserve Requirements Moral Suasion	Selective Credit Controls Refinances, Reserve Requirements Moral Suasion Bank Rate	Bank Rate Repo, Reverse Repo Corridor, OMO CRR	Repo (policy rate) OMO Liquidity Management CRR (rarely used)

Source: Tabulation by author.

**3.2 Underdeveloped Stage 1950-1985:** The ability of the monetary authorities to pursue discretionary policies is implicitly contingent on the underlying transmission mechanisms in the economy which in turn depends upon the development in the banking and financial sectors at large. In an underdeveloped economy the choice of instruments is constrained by the nature of financial markets. The implementation of monetary policy involves a choice between alternative instruments. The choice is rarely an unconstrained one. In the initial years of monetary policy making in the Indian context, the institutional factors like the underdeveloped nature of the credit markets limited the extent to which indirect instruments could be used. In these early stages existence of shallow markets which were highly segmented

required that the central bank took specific measures for each of the segments. Secondly, as the country had embarked on the development path through the institution of the five-year plan, a balance was sought to be achieved between the shorter run demand management goals and the longer run issues of institutional and financial development. During this phase with the developmental goals in sight, deficit financing was used to finance a part of the plan outlay. The monetisation of the public debt and deficit financing continued to contribute to the price inflation during the 1950s (First and Second Five Year Plans). Further, considerable developmental expenditure generated an upward pressure on the prices of consumer goods, and warranted regulation of supply of credit to check these pressures. To tone down the impact

of the inflationary situation the Bank Rate was raised in a graduated manner. Selective credit controls that were introduced in 1956 to arrest speculative hoarding of commodity stock using bank credit. While this first stage made greater use of sectoral policies and interventionist approach, as the financial system is based on direct controls on credit and interest. This phase has all the instruments co-existing and as the older interventionist instruments are being phased out and indirect instruments are just being introduced, the direct instruments are also effectively deployed. During this phase there is a need for a variety of instruments to ensure effective monetary management.

In the sixties, there was a greater focus on economic growth. Inflation continued to be an issue due to the deficit induced increases in money supply. Money was made dearer. This objective was sought to be achieved by reduction in overall credit, by reducing Reserve Bank accommodation to the banking system and use of selective credit controls. Larger defense requirements due to the war crowded out the investment expenditure as war affected Government finances adversely. Monetary policy had to play an accommodating role to supplement the fiscal measures by regulating commercial banks' capacity to lend (by

altering the credit multiplier) and through direct methods of credit control. The reserve requirements were raised.

With nationalisation of the 14 major commercial banks in July 1969, social objectives received increased emphasis, the foremost of these was that of increasing the flow of credit to the priority sectors of the economy. The monetary policy during the 1970s continued to be constrained by the central bank's support to the developmental goals of the Government. The most spectacular attainment during the post nationalisation period was the rapid bank-branch expansion. Banks drew the channels of transmission of monetary policy far and wide across the country. Spread of banking increased the monetisation in the economy and increased the savings habit of the population. The large expansionary effect of the plan outlays increased the income and the rise in saving habit was a very crucial development. This increased the efficacy of monetary policy because when interest rates were raised to counter resultant inflationary pressures, saving rose and restrained expenditure. During this period the monetary policy had to tighten through a series of direct instrument changes as well as the interventionist instruments and the direct controls on expansion of credit creation by the commercial banks. The one important

element in the conduct of monetary policy since 1970 was seen in the phenomenal increase in reserve money due to RBI credit to Government. In order to control monetary expansion, the central bank tried control to influence size of the money multiplier by raising reserve ratios.

Through the 70s and 80s interest rates continued to be administered and the flexibility and utility of this monetary policy instrument was lost. Heavy government borrowing required that the cost of credit to the exchequer to be maintained at a low level. The allocative role of credit policy, required an administered nature of interest rates, making the most crucial instrument of monetary policy partially defunct. Government subsidies were often necessary and this was one of the factors that led to a chronic budget deficit. These deficits were either financed through ad hoc treasury bills or through indirect borrowings. Automatic monetisation cause huge expansion in Reserve Money and several methods were adopted to restrain inflation by reducing the credit multipliers, by altering the cost and availability of Reserve Bank accommodation to banks, or by engineering changes in the deposit and lending rates of banks, selective credit controls, and quantitative guidelines on credit expansion.

### *3.3 Monetary Targeting 1985 - 1998 (Expansionary Stage)*

The Report of the Chakravarty Committee (Reserve Bank of India, 1985-Chairman: S. Chakravarty) was submitted in 1985. Its recommendation for the change of framework to "monetary targeting with feedback" was accepted. The concept of "monetary targeting with feedback" was different from traditional monetary targeting with fixed monetary growth. It was felt that the appropriate framework for the day was one which targeted monetary growth, should be modified based on the information available on expected increase in output and a tolerable level of inflation. Thus, the monetary policy framework in India between 1985-86 and 1997-98 could broadly be classified as a "flexible monetary targeting approach", with M3 growth as a nominal anchor, reserve money as the operating target and bank reserves as the operating instrument [Mohan, 2005].

Interestingly, economists then often referred to the channels of "monetary transmission" as a black box - implying that while monetary policy does influence output and inflation the exact mechanisms were not clear. Thereafter, researchers have enriched the literature by identifying and gauging transmission along various channels, the foremost



amongst these is the interest rate channel the others being the quantum channel, (e.g., relating to money supply and credit); expectations rate channel; the exchange rate channel; and the asset price channel, to name a few. How these channels function in each economy and the same economy over time depends on the stage of development of the economy and its underlying financial structure. Consequently, their functioning should be re-assessed after each episode of liberalisation. Illustratively, in an open economy one would expect the exchange rate channel to be important; similarly, in bank dominant economies where banks are the major source of finance (as against the capital market) credit channel has been the major conduit for monetary transmission. Besides, it needs to be noted that these channels are not mutually exclusive - in fact, there could be considerable feedbacks and interactions among them.

Monetary policy was formulated in terms of intermediate targets until late 1990s, (thereafter more and more countries have come to adopt the inflation targeting framework wherein the goal of price stability is directly addressed by the central bank). Under monetary targeting an intermediate target for monetary policy was achieved in order to attain the ultimate target of inflation in a two-stage procedure. Box 1 explains the mechanics

of monetary targeting. Note that in the first stage, the central bank determined the value of the intermediate target consistent with the desired ultimate goal under a variety of *ex ante* assumptions. The next step involves achieving the value of the intermediate target that was set *ex ante*, as if it were its goal. An intermediate target is very useful, in a dynamic economy in which the relevant variables exhibit 'leads and lags' distributed through time, especially because valuable information about the output and price level achievements are not quickly available. For policy purposes the central banks identify an intermediate target, whose relationship with the ultimate target variable is strong and predictable and the data on these are available expeditiously.

Prerequisites of the monetary targeting on the demand side condition of stability of the money demand; The second prerequisite is on the supply side which is the stability of the relationship between Monetary Aggregate (M3) and the Reserve money (RM). There was evidence of a long-term relationship (cointegration) between M3 and RM at the initiation of the monetary targeting phase. Lastly the use of the intermediate target is justified if there is a stable long-term relationship between the intermediate target and the ultimate goal, here between monetary aggregate, output and prices.

**Box 1: Monetary Targeting Phase (1985-1997)**

Operating target  
Reserve money

⇒

Intermediate target  
M3

⇒

Final targets  
Inflation Growth

**Money Demand Projections:**

M3 was projected in a manner consistent with expected GDP growth and a tolerable level of inflation

- \* If  $y$  = real growth rate = 7%, tolerable inflation (or self-imposed target) = 5%
- \* The elasticity of demand for money was estimated if it were = 1.3 % then
- \* Targeted M3 growth =  $7(1.3) + 5 = 14.1\%$ .

Like a control problem, working backwards the requisite level of RM that yields the requisite level of M3 = 14.1% was computed given the credit multiplier. This operating target of RM that is compatible with the targeted M3 level is arrived at.

Source: Author's analysis.

The stability of the relationship between RM and M3 was the corner stone for the supply side of the monetary targeting framework, implemented in India during 1992 to 1997. The broad money - reserve money relationship was effec-

tively functioning as a rule in the monetary targeting framework. Jalan [2004] has rightly designated this rule as the Rangarajan framework. Here again there was the issue of which monetary aggregate  $M_1$  or  $M_3$  was more appropriate.

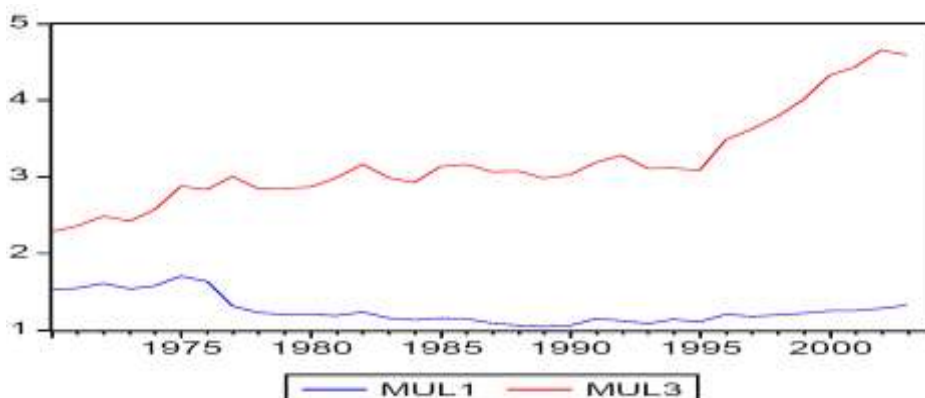
$$M3 = \text{Reserve Money} * \text{Multiplier}$$

Although basic money supply relationship may seem to be fairly elementary, its simplistic formulation is but a facade to the mechanics of its control which is so intricate as to absorb both the academics and bankers for years.<sup>2</sup> The reserve money or the monetary base is

used as the operating target by many central banks. This is because most monetary policy actions influence and determine the size of the monetary base. The monetary base in countries with well-developed financial markets is influenced by the OMOs conducted by

the central banks. The linkage between RM and M3 is only as predictable as the stability of the multiplier. In the Indian context we have two multipliers. The first is the narrow money multiplier that is defined as Narrow money divided by Reserve Money. This is the stricter definition of a multiplier,  $MUL1 = M1/RM$  and the second which was  $MUL3 = M3/RM$  that uses the Broad Money (M3).

**Chart 1: Narrow money multiplier (MUL1) and Broad money multiplier (MUL3)**



Source: Authors' computation.

As is evident from the Chart 1 that during the financial liberalisation period after the year 1995-96, the multiplier shows a distinct break from the past trend. This is because this was the period when the interest rates were deregulated and the banks achieved greater control over their balance sheets. During the pre-reform years, the simplifying assumption of a multiplier being non-responsive to interest rates was justified in the administratively controlled regime of interest rates and limited availability of money substitutes in the absence of financial innovations. However, after interest rate deregulation in 1997 there was develop-

ment in the financial sector, in the payments and settlement system and in product development by banks and other financial institutions. During this period India's monetary policy saw some major changes the foremost is the phasing out of the automatic monetisation of the fiscal deficit April 1996, this freed it from the subservient role to the fiscal policy granting it the autonomy that is very crucial for its operations. The financial sector was changing rapidly and there was a need to relook at the framework of monetary policy.

In India the approach to reform in the banking and financial sector was guided by caution and emphasis was given on proper sequencing of various measures. The financial sector liberalisation was gradual so as to ensure that there is no backtracking. These reform measures were implemented as a package to move ahead on interrelated areas so that reform was mutually reinforcing and benefited from complementarities, for example, reforms in the banking sector, fiscal, external and monetary policies were simultaneously initiated in co-ordination with the Government. Effort was made to put in place an appropriate infrastructure in terms of supervisory body, audit standards technology and legal framework. Most importantly initiatives were taken to nurture, develop and integrate the money, debt, and forex markets. See Reddy [2000] for a detailed discussion on the reform process. The 1991 the Balance of Payment (BoP) crisis triggered large scale reforms in the Indian economy. Reforms in the banking sector could be broadly divided into two broad phases. The first phase from 1991-92 up to 1997-98 and the second phase thereafter. With the initiation of reform from the year 1991-92, a number of initiatives were taken on the interest rate and monetary policy side. A phased reduction in the SLR and the CRR was undertaken beginning January 1993.

During the period when money supply targeting was practiced, the underlying issue was whether the reserve money is an appropriate operating target to be able to influence variation in the money stock (M3). The reserve money was found to be a more appropriate operating target in India compared to variables like borrowed or non-borrowed reserves that were earlier used in countries like the USA. This is because very few banks maintained excess reserves in that period. Also, because the management of the excess reserves of the banking system requires well developed markets and flexible interest rates. In India during that phase of monetary targeting interest rates were administered and the security market was underdeveloped. The Reserve Bank therefore maneuvered the reserve money to affect money supply. The micro-foundations of this exercise were in the form of a detailed credit budget exercise by the Reserve Bank of India that looked at resource management by commercial banks in great detail. The Credit Budget meetings (later called as the Resource Management meetings) with commercial banks and the detailed assessment of "sources and uses of funds" of commercial banks gave RBI a clear idea about the expected credit growth during the period under consideration as well as the support to the Government's market borrowing programme. Together with this micro level information from

the commercial banks regarding their asset portfolio determined the changes in the reserve money RBI was in a better position to understand the possible trajectory that the M3 would take.

During the period prior to financial liberalisation the changes in the reserve money were mainly dependent upon the net RBI credit to central government, the bank credit to commercial sector with net foreign exchange assets accounting for a small proportion of the reserve money growth. Over the years with growing openness of the economy, there were large capital flows and consequently the Net Foreign Exchange Assets (NFA) grew in strength. The NFA are relatively less amenable to control by the monetary authority. As the economy liberalised there were greater capital flows, this was evident in the surge in Net Foreign Assets during the 1993-95 periods and led to massive increases in money supply. Especially as banks were holding excess reserves the raising of the required reserve ratio was not very effective and similarly when the reserve requirement is lowered the impact of expansion of credit may not take place if banks choose to maintain excess reserves rather than increase their lending. The RBI Credit to central Government is now technically amenable to control by the RBI since the phasing out of *ad hoc* in 1997. In years prior to financial liberalisation, it was

necessary to use the direct instruments like CRR and SLR to affect the value of the multiplier to limit the impact of the growing government borrowing in terms of money supply. The rise in Reserve Money due to increase in the RBI credit to central Government was countered by the increase in CRR and SLR reducing value of the deposit multiplier, to contain the increase in the money supply.

The process of financial sector liberalisation has a wide-spread impact on the important relationships in the financial sector. These relationships need to be periodically empirically examined. The money supply is expressed as the product of the reserve money and the multiplier.  $M3 = mm * RM$  this is a very useful formulation. Over the liberalisation years there was increased difficulty in controlling the money supply using the money supply rule of  $M3 = mmRM$ . This reflected the shifts in the other variables like currency, the change in interest elasticity of reserve demand and most importantly dilution of the link between the reserve money and M3. The large shifts on the supply side make it difficult to adhere to quantitative targets. The monetary targets were given up in 1998. The money multiplier is a function of currency ratio set by the depositors, or the money using sector, excess reserve ratio set by the banking system and required reserve ratio set by the monetary

authority. This mechanistic entity is in reality the outcome of the interaction of diverse agents like the commercial banks managing their portfolios and setting an array of asset ratios financial institutions, mutual funds and others offering deposits that are close substitutes to the bank deposits. The multiplier may be therefore technically prone to some extent of endogeneity.

All these developments have imparted greater responsiveness of interest rates to asset holding decisions of economic units. Given market determined interest rate structure and yield spreads, the commercial banks have been able to adopt better cash management practices. Money multiplier thus becomes a function of an array of asset holding ratios, which are responsive to macro-economic variables. In this event the empirical question that needed careful examination is whether the multiplier can remain stable in face of financial innovations and liberalisation. The theoretical and empirical evidence pointed to the contrary.

In India the reserve requirements were initially imposed as a prudential requirement in order to safeguard the interest of the banks as well as depositors. After the fiscal over runs in the early decades of planning reserve requirements in India became an important way of

preempting the resources of banks. Secondly, since the automatic monetisation of fiscal deficit kept reserve money higher, direct instruments were used to affect the money multiplier and restrain deposit growth and money supply. This phenomenon reached a peak in 1991 when the SLR plus CRR together reached an unsustainable level of 63.5 per cent. Subsequently, with initiation of reforms, the SLR was gradually reduced to the then statutory minimum of 25 and the CRR has also been progressively reduced. The Working Group on Money Supply (Chairman: Y.V. Reddy) [Reserve Bank of India, 1998] sought to address some of these issues. The most significant observation of the Group was regarding the changing nature of transmission mechanism as it highlighted that the interest rate channel was gaining in importance. The year 1998-99 marks a watershed, when the impact of financial deregulation started being felt in the financial sector. As predictive stability was important to a central bank as illustrated in the RBI Working Group on Money Supply [1998], the view emerged that a policy, based exclusively on demand for money, could lack precision. The alternative was thought to be a switchover to the multiple indicators approach.

### 3.4 Multiple Indicators Approach (MIA) *The Developing Stage: 1998-99 to 2015-16*

In 1998-1999, the Reserve Bank adopted a multiple indicators approach wherein a host of indicators including credit aggregates, prices, interest rates were monitored. The monetary aggregates were de-emphasised as targets but they continue to play an important role as information variables. This phase saw a high growth in money supply but a low growth in inflation.<sup>3</sup> The RBI Working Group on Money Supply showed that in the short run, the price effect of money supply may deviate from the long run equilibrium behaviour. This is more evident during periods of supply shock. The lower inflation in these years was a worldwide phenomenon.

In 1998 a multiple indicators approach was formally adopted; this marked the formalisation of the series of strategies that were adopted by the monetary authority in view of the growing complexities of macroeconomic management. As per this approach, interest rates or rates of return in different markets (money, capital and government securities markets), along with data such as on currency, credit extended by banks and financial institutions, fiscal position, trade, capital flows, inflation rate,

exchange rate, refinancing and transactions in foreign exchange available on high-frequency basis, were monitored and juxtaposed with output for drawing policy perspectives. The idea was to place reliance on a broad set of economic and leading indicators rather than focusing exclusively on an intermediate target of monetary aggregates or moving to a direct inflation target.

The SLR served the three purposes of garnering support to the Government borrowing programme, of moderating the impact of automatic monetisation of *ad hoc* and the prudential purpose of keeping banks' resources in sound approved assets for liquidity purposes. After the BIS introduced the Liquidity Coverage Ratio (LCR) the SLR was cut periodically to facilitate banks moving over to the LCR regime. SLR is now at 18 per cent. These excess holdings of SLR and LCR change as per state of liquidity and pick up of credit in the economy. The excess reserves are also sensitive to the change in their opportunity cost, viz., call rates, auctions, the availability of some major issues in the market, etc. Both the CRR and the SLR proved to be quite powerful instruments in the hands of the RBI during these phases. While the CRR affects the ability of credit creation of the commercial banks by reducing the value of their deposit multiplier, the SLR works by

impounding the commercial banks deposit resources. Additionally, commercial banks' holding of government paper in the form of SLR provided a 'captive' market for Government securities. The earlier emphasis on RBI's function as manager of public debt required was focused towards ensuring support to the Government's market borrowings at sub-market rates. As government debt market was liberalised and started yielding market rates banks voluntarily invested more than the stipulated SLR.

In the Indian context the indirect instruments grew in importance with the freeing of interest rates by abolishing of the numerous administratively fixed limits on them. The discount rate was called the Bank Rate in India. It was then a rate at which the RBI lent to the commercial banks. The Bank Rate was revitalised as an instrument in 1997, all rates charged on borrowings from RBI were linked to this rate. Such borrowings from the central bank were usually in terms of refinance for various purposes such as food credit, export credit, purchase of Government securities etc. Later the discount window borrowing was reduced in scope and limited to export credit and a few *ad hoc* eventualities. In the period during 1994 to 2000, the Bank Rate as the policy interest rate was used intensively, especially in the year 1997.

After the introduction of the Liquidity Adjustment Facility (LAF) introduced in June 2000, the interest rate for the repurchase agreement or the Repo rate became more prominent as an instrument of short-term control while Bank Rate was used as the medium-term instrument. The present exercise uses the Bank Rate for the period 1991-92 to 2000-01 when it was used prominently.

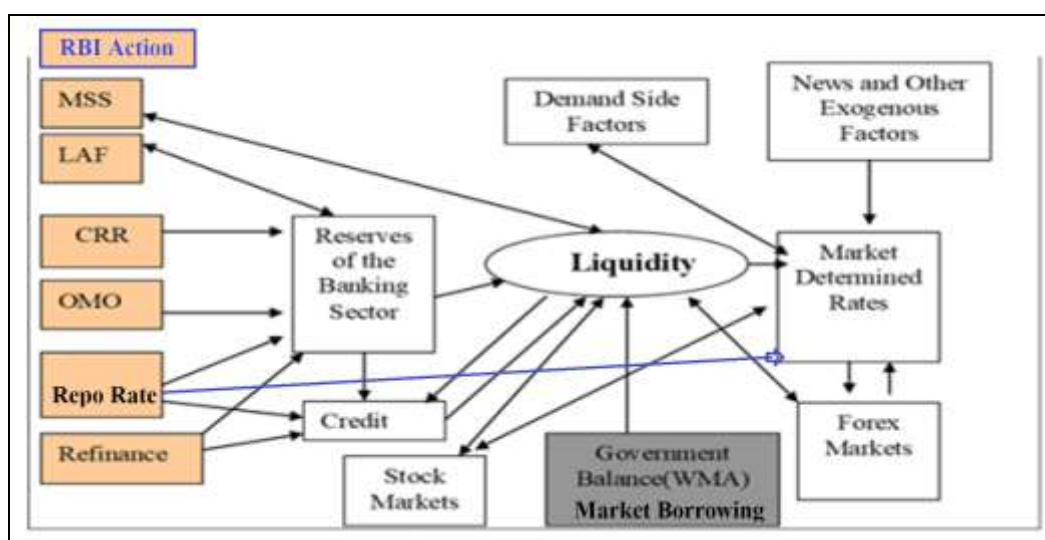
The Reserve Bank uses a multipronged approach to affect market rates policies, interest rates and liquidity. The reverse repo rate and the Bank Rate are the two policy rates were simultaneously used by the Reserve Bank till the liquidity management stabilised. Thereafter, repo / reverse repo rates were used. These rates are used in combination with Open Market Operations and LAF auctions of Government Securities to affect medium and long-term interest rates and liquidity. Financial sector reform in the Indian economy enabled a distinct shift in the operating procedures from direct instruments of monetary control to market-based indirect instruments. By June 2000 a full-fledged LAF was operational and proved to be a major game changer in the realm of liquidity management. The multiple indicators approach (MIA) recognised the growing inter-linkages in the financial market, and enabled a transition to liquidity management through OMO in the form of outright purchases/sales of government securities



and use of the daily reverse repo and repo operations under Liquidity Adjustment Facility (LAF) in present form was introduced effective June 5, 2000, with the objective of managing short run frictional liquidity under varied financial market conditions. The eligible securities-used for the LAF operations were SLR eligible Securities- Government of India (GoI) dated securities, T-bills, State Development Loans. Liquidity management entailed assessing

the liquidity needs of the banking system and injecting or absorbing the appropriate amount of liquidity through various instruments. The Reserve Bank of India actively manages banking system liquidity through appropriate and flexible use of instruments at its disposal. Liquidity management provides sufficient levers to the central bank to modulate liquidity and smooth out unevenness (see all the colored boxes on the left-hand side of Chart 2 below).

**Chart 2: Liquidity and Market determination of interest rates**



Source: Dua and Raje [2014, Pp. 375-400]

Liquidity was managed to address unevenness caused by changes in Central Government Account, Government borrowing Program of the Centre and State, issuance/ reissuance of securities, redemptions, coupon payments, advance tax collections and GST outflows as well as patterns of the Government spending and the extent of capital flows. The extent of liquidity in the system is a product of a number of factors these factors affect the market determined rates, but in addition to this the direct policy rate changes by the RBI also affect the market rates (here the blue arrow).

In early 2000s, RBI modulated short-term liquidity by conducting repo auctions (for injection of liquidity) and reverse repo auctions (for absorption of liquidity) at a fixed repo/reverse repo rate on a daily basis (Monday to Friday, excepting holidays). The LAF enabled the Reserve Bank to modulate short term liquidity under varied financial market conditions, including large capital inflows from abroad. In addition, it enabled the Reserve Bank to set a corridor for the short-term interest rates consistent with the policy objectives. This operating environment gave the main role to repo/reverse repo rates as the interest rate signals for liquidity management. Reserve Bank used multiple instruments to ensure that appropriate liquidity is maintained in the system so that all

legitimate requirements of credit are met, consistent with the objective of price stability. Towards this end, the RBI pursued a policy of active management of liquidity through OMO including LAF, MSS and CRR, and using the policy instruments at its disposal flexibly as and when the situation warrants.

A great deal of reliance was placed on interest rates and exchange rates in the day-to-day conduct of monetary policy. In the context of increasing openness of the economy and a market-determined exchange rate, the large capital inflows witnessed in 2003-2004 had posed major challenges to the conduct of monetary and exchange rate management. A need was felt for a specialised instrument. While the liquidity impact of large inflows was managed till the year 2003-04, largely through the day-to-day LAF and OMO. In the process, the stock of government securities available with the Reserve Bank declined progressively and the burden of sterilisation increasingly fell on LAF operations. In order to address these issues, the Reserve Bank signed in March 2004, a memorandum of understanding (MoU) with the Government of India for issuance of Treasury Bills and dated government securities under the Market Stabilisation Scheme (MSS). The intention of MSS is essentially to differentiate the liquidity

absorption of a more enduring nature by way of sterilisation from the day-to-day normal liquidity management operations. The ceiling on the outstanding obligations of the Government under MSS has been initially indicated but is subject to revision through mutual consultation. The issuances under MSS are matched by an equivalent cash balance held by the Government in a separate identifiable cash account maintained and operated by the Reserve Bank. The operationalisation of MSS to absorb liquidity of more enduring nature considerably reduced the burden of sterilisation on the LAF window. The MSS was used again in 2016 to absorb a deluge of liquidity after demonetisation.

Short term liquidity is managed using the instruments of Overnight fixed rate Repo, Reverse Repo, MSF and variable rate 14-day Term Repos to name a few. The liquidity fine tuning operations-variable involved rate repo and reverse repos, Forex swaps and MSS. Long term permanent liquidity was modulated through Open Market Operations (OMO), CRR, MSS and Forex Intervention. The liquidity management framework was improved in May 2011, thereafter in September 2014 and fine tuned in April 2016. Over the years there was better and better liquidity management by banks guided clearly by central

bank communication and pro-active measures to ensure that there is no or very little volatility in the short-term interest rates (WACMR). The width of the corridor was also adjusted periodically.

### *3.6 Flexible Inflation Targeting the Developed Stage: 2016 onwards*

In India by the end of 2013 the MIA as a framework developed and was in many ways a precursor to the inflation targeting framework with the use of a multiple indicators, survey-based data and alternative model-based forecasting of inflation and output in RBI. Consequently, most of the nuts and bolts of the inflation targeting framework had long existed in the system, like the preparation of an inflation forecasts (informal) target. In January 2014 a glide path was announce for bringing down the CPI inflation to 6 % over the period over the subsequent 2 years. During this period the changes in the monetary policy have been noteworthy a with the setting up of an Expert Committee to Revise & Strengthen the Monetary Policy Framework [2014, Chairman Urjit Patel]. The Urjit Patel Committee suggested further changes in monetary policy framework and also laid out the glide path for the framework change. In the context of improving transparency, the recent trend has been towards direct inflation targeting.

Adoption of explicit inflation targeting as the final goal of monetary policy. The Monetary Policy Framework Agreement (MPFA) was signed with the government in February 2015. Getting the government on board for a commitment towards an inflation goal marked a watershed in monetary history of India. Hitherto, maintaining low inflation was considered to be only the onus of the central bank, now with government on board this responsibility was fairly shared. May 2016 saw a formal beginning of Flexible Inflation Targeting (FIT), wherein the central government in consultation with the RBI determined the formal inflation target of 4 % with a band of  $\pm 2\%$  around this for a period of 5 years. These operating procedures were formalised and the amended RBI Act came into force on June 27, 2016 and the MPC was constituted by a notification in the official Gazette on September 29, 2016. It was expected to meet at least 4 times a year. Such MPC meetings are now a bi-monthly feature since October 2016. The resolution of the MPC decision is published after MPC policy meetings where in interest rate decision is announced by the Governor and he also holds a press conference later on the same day. Thereafter, the minutes are to be published on the fourteenth day after the meeting. The inflation targeting framework has been very effective in India.

Having an inflation target and meeting it, enhances the credibility of a central bank. India has exhibited considerable success in this endeavor as noted in RCF 2021.

#### 4. Data and Methodology

Our exercise here tries to gauge the influence of the policy rate on the lending rates under each regime. *We find that the strength of the transmission through the interest rate channel, more specifically to lending rates has increased over time.* The study uses monthly data from the Data Base on the Indian Economy (DBIE), CMIE and Banking Statistics and Handbook of Statistics on the Indian economy, the RBI website and RBI Bulletin from the public domain. This work requires bank wise quarterly data on bank's advances, NPAs, lending rates, Production indices, Prices and indices, Policy rates, External Sector, Monetary aggregates, Liquidity aggregates and Banking aggregates.

Methodology: Standard time series Vector Autoregressive models are used for the exercise. The paper attempts to model in the Panel VAR framework. We constructed various VAR models using monthly data on monetary policy rates, Bank rate, Repo rate, Reverse Repo rate, CRR, SLR, OMO, narrow money supply (M1), broad money supply (M3)

and Reserve Money (RM) which is the monetary base and the index of industrial production(IIP).

We use several VAR models in each exercise as specified from section to section in order to explore the impact of the policy rate change on lending rates of commercial banks during the period 2012 to 2021 a VAR analysis using a set of four variables Growth, Inflation, Repo rate and the weighted average Lending rate (WALR) was used for each of the bank group.

## 5. Empirical Exercise

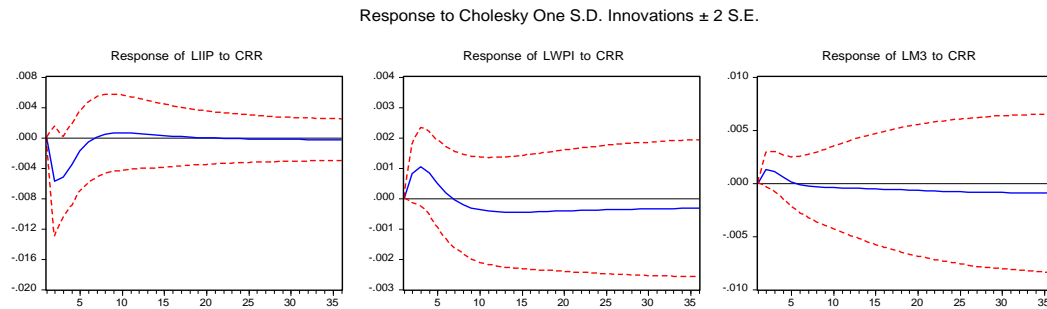
### 5.1 Cash Reserve Ratio

Even today the CRR remains a powerful instrument in India, in spite of the movement towards indirect instrument and has been used when large liquidity surplus needs to be mopped up the CRR or Incremental Cash Reserve Ratio are used very effectively. This is because of its ability to instantly affect the commercial banks cash management decisions. Moreover, it has a sustained effect, as the increased portion of deposit mobilisation is continuously siphoned off so long as the CRR remains at the higher level. The VAR exercise undertaken here deals with the change in the CRR during

this period and its impact on the deposit multiplier that resulted in a change in the intermediate target of money and thereafter the money (M3) affects the output. The ordering of the variables is a specification search. We know that the logical pattern of the stimulus runs from the change in reserve requirements affecting the multiplier and thereby money and output. The impulse response function is given herewith. When the system is in equilibrium we shock it with a one-time shock, of one standard deviation to CRR we observe how money supply (LM3) and output (LIIP) respond to it. The empirical exercise undertaken here uses monthly data for the period 1996-97 to 2004-05 the Vector Auto Regression or VAR of the variables Output (LIIP), Prices (LWPI), Cash Reserve Ratio (CRR) and the Broad Money supply (LM3). Using a Cholesky factorisation we order the variables in the following order: LIIP first, LWPI second, LM3 third and CRR fourth. The next step is choosing the appropriate lag length. There are various alternative criteria for this, Akaike Information Criteria (AIC), Schwartz or Bayesian criterion (SBC) and Hannan-Quinn (HQ) information criterion are suggested in literature. Of these, the most parsimonious is SBC, which we used. This criterion

suggested the use of 2 lags. After running the Impulse Response function which are the VAR with 2 lags we get the results of presented below in Chart 3.

**Chart 3: Impulse Response to Shock in CRR**



Source: Author's model based empirical estimations.

The rise in reserve requirements(CRR) is seen to decline after 3 to 4 months. This shows a distinct negative impact on money supply indicating that the reserve requirements are effective in curtailing money supply. Having increased the CRR once, this effect is seen to persist even over a large period on the output. Rise in the CRR has a negative impact on the M3 and WPI, this impact peters out after 10 months. This impact could be seen as a combined effect on output through restrained liquidity and the announcement effect of the CRR rise. The price level as depicted by the LWPI is seen to decline after 3 to 4 months. This is true as the CRR works through the money supply and thereafter on prices, this lag in the response of the price level shows that the monetary policy effects take time before they can have the entire impact. As seen in Chart 2 reserve requirements have strong effects on output and prices. A positive shock to CRR reduces output (IIP) also that takes around 5 weeks to come to its level. The CRR change also has a strong effect on prices. The variance decomposition can be seen from the Table given below.

**Table 2. Variance Decomposition of Shock to CRR***Variance Decomposition of LIIP:*

Period	S.E.	LIIP	LWPI	LM3	CRR
3	0.0650	91.6527	6.2114	1.3944	0.7415
6	0.0673	90.7677	6.5820	1.7653	0.8850
10	0.0679	90.3876	6.4955	2.1862	0.9307

*Variance Decomposition of LWPI:*

Period	S.E.	LIIP	LWPI	LM3	CRR
3	0.0150	5.0995	92.9582	0.9615	0.9808
6	0.0205	3.6828	90.5929	3.1436	2.5806
10	0.0253	2.7522	85.4508	6.7005	5.0965

Source: Author's model based empirical estimations.

We observe that in the Indian context the CRR has been very useful in injecting (into the system) and withdrawing liquidity (from the system). An increase in the CRR requires the banks to purchase temporary liquidity from the central bank raising their cost of credit and reducing their ability to create secondary deposits or to lend. The use of the CRR remains very effective but as an instrument is presently being deemphasised. It is used in face of urgent requirement to absorb or infuse liquidity into the system.

## 5.2 Bank Rate Transmission to PLR

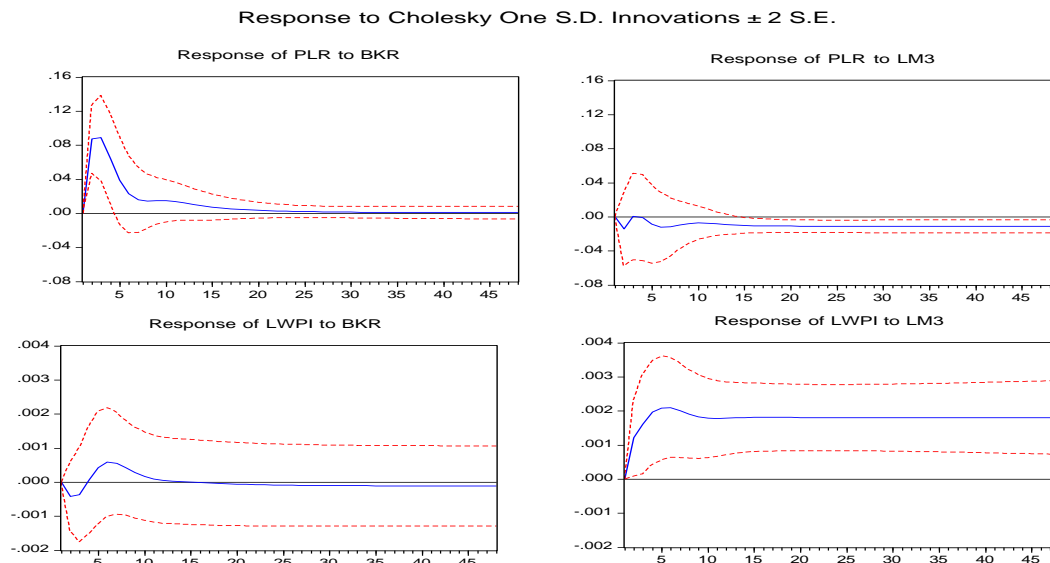
Impact of the Bank Rate on the Prime Lending Rate: The PLR was the lending rate that the banks offer to their prime borrowers. The commercial banks are

free to set the PLRs with the consent of their Boards/ALM Committees in line with market conditions. The reduction in the policy rate during this period did not translate into the same extent of decline in the lending rates during the late. However, what is worth noting is the asymmetry in the response of the banks across their asset and liability side. The rates were selectively sticky. There is an asymmetry of response as the increase in the policy rate is now transmitted to a greater extent through the maturity spectrum of interest rate when the interest rates rise than when they fall. The stickiness of the interest rates that was observed on the lending side when the interest rate fell was not visible on the deposit side when the interest rate rose. The net interest margins of the banks

went up in the process and the spreads broadened. This made the RBI stress on transparency and a need for the announcement of the PLR/benchmark PLR and the rate at which the majority (60 per cent) of the loans were contracted. We estimate a VAR using the variables Bank Rate (BKR), Prime Lending Rate (PLR), Industrial Production Index (LIIP), and Wholesale Price Index

(LWPI). We gauge the impact of the changes in the policy rate on the market rate (call), output (LIIP) and prices (LWPI). The period for analysis is 1997:06 to 2004:10. The Cholesky Ordering is LIIP LWPI PLR BKR LM3. The Impulse Response Functions (IRF) of the model using the PLR as a lending rate are plotted in Chart 4 below.

**Chart 4: Impulse Response of the PLR to Changes in Bank Rate and LM3**



Source: Author's model based empirical estimations.



**Table 3: Variance Decomposition of PLR:**

Period	S.E.	LIIP	LWPI	PLR	BKR	LM3
3	0.33	2.39	1.99	81.53	13.90	0.19
6	0.38	2.20	5.43	76.90	15.16	0.30
12	0.39	3.07	9.50	72.08	14.76	0.59
18	0.39	3.40	9.55	71.28	14.78	1.00
24	0.40	3.71	9.49	70.66	14.68	1.46
30	0.40	3.99	9.52	70.02	14.54	1.93
36	0.40	4.27	9.60	69.36	14.38	2.40
48	0.41	4.79	9.79	68.06	14.06	3.30

Source: Author's model based empirical estimations.

The variance decomposition of the PLR is given in the Table 3 above. While separate variance decomposition for each of the endogenous variables is available but we give the one relevant of transmission of the policy rate. Please note that the second column, labeled "S.E.", contains the forecast error of the variable at the given forecast horizon (period). The source of this forecast error is the variation in the current and future values of the innovations to each endogenous variable in the VAR. The remaining columns give the percentage of the forecast variance due to each innovation, with each row adding up to 100. It is interesting to note that the Bank rate accounted for around 14 per cent of variation in PLR and the WPI accounts for only around 9 per cent of the variation. Although in each time the policy rate fell, the longer-term deposits rates fell in tandem, e.g., during the period March 2000 to March 2003 the policy rate fall caused an immediate adjustment in the longer end of the liability side of the banks with the deposit rate falling by 425 basis points for over three years maturity whereas the shorter-term deposits rate fell only by 50 to 100 basis points. The fall in the policy rate seldom resulted in the same intensity of fall in the lending rates due to pre-committed loans and because banks often used such occasions to increase their spread. During the period till 2003 changes in the Prime Lending Rates were disproportionately distributed with the prime customers getting finer sub-PLR rates at the cost of the other retail borrowers. Our results show that the phenomenon of policy pass-through has increased over the years. The impact of the policy rate change persists over the short and

medium run. As depicted in the impulse response graph above, the response of PLR to the changes in Bank rate is sustained over the first five months and tapers thereafter. The effect does not however go away over the long run, indicating that the increase in the policy rate has a sustained upward impact on the market rates of interest through higher cost of funds.

There is empirical evidence showed that the Bank Rate channel remained somewhat unresponsive in terms of output during this period, as seen in the last panel of the Chart 4. This is essentially on account of certain inbuilt systemic rigidities as outlined in the Mid Term review of the monetary and credit policy of October 1999. The main reasons for interest rate stickiness in our economy could be listed as: higher incidence of intermediation expenses, overhang of NPAs, pressure of government borrowing, high level of CRR and the existence of an array of contractual savings instruments such as PF, National Savings Scheme etc. offering substantially higher returns than others, Mohanty and Raje [1998]. Another reason for the lack of adequate response to Bank Rate changes was reduction in the number of loans tied to the Bank Rate; these are mainly in

nature of refinances offered by RBI over the years the sector specific refinances were gradually phased out. The Bank Rate was gradually de-emphasised as a policy rate during the period after June 2000 and the introduction of LAF window. The period after this saw the emergence of the Repo as an instrument of policy. With the success achieved by the Reserve Bank at attaining liquidity adjustment using LAF the repo and reverse repo instruments increased in importance.

### 5.3 BPLR Regime:

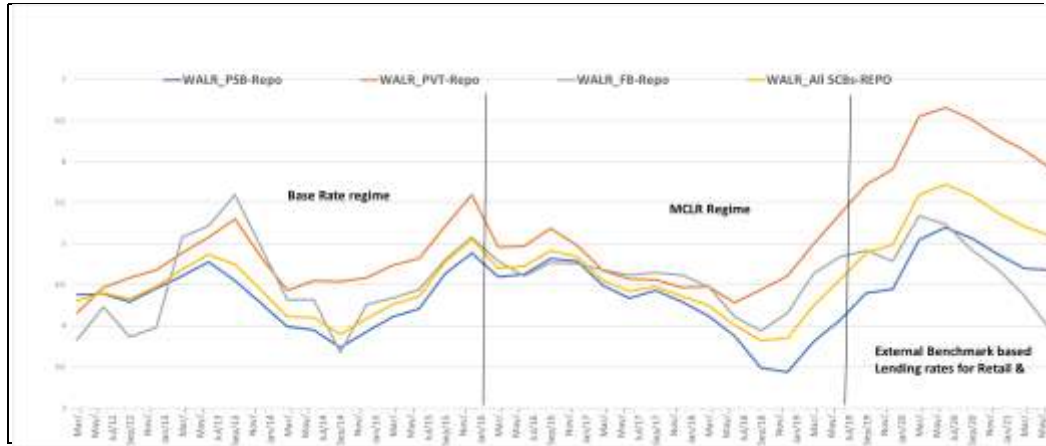
A scheme of benchmark PLR (BPLR) was mooted by the Reserve Bank in the Monetary and Credit Policy 2003-04 for ensuring transparency in lending rates and for reducing the complexity involved in pricing of loans. While arriving at their BPLR, banks were advised to take into account (i) actual cost of funds; (ii) operating expenses; and (iii) a minimum margin to cover regulatory requirements of provisioning/ capital charge and profit margins. RBI liberalised the system by refraining from detailed micro level regulatory guidelines by giving banks the autonomy in arriving at their own BPLR. The BPLR, which served as a benchmark or reference rate rather than the minimum

lending rate, was found to have serious flaws and fell short of its expectations as found by the Deepak Mohanty Committee for review of BPLR. Sub BPLR lending that initially was allowed only to exporters and creditworthy customers was later extended to major profitable corporates because of competitive pressures, *soon sub-PLR lending came to account for more than three fourth of advances by the banks*. With the huge incidence of sub BPLR lending the major issue was that of lack of transparency in lending rates and the downward stickiness of BPLR. While banks were often quick in raising lending rates during an upturn in the interest rate cycle, they were slow to bring down the interest rate in the downturn of the interest rate cycle. This impeded the effective transmission of monetary policy. The Mohanty Committee suggested introduction of a system of Base Rates to overcome these problems.

#### 5.4 Base Rate Regime

In order to overcome the lack of transparency of the BPLR regime the Mohanty Committee suggested the use of

the Base rate-based system where lending rate was expected to reflect banks own cost of funds. There was a great deal of flexibility that was given to the banks as the base rate formula was only indicative in nature. The banks were free to use average cost of funds or marginal cost of funds, they opportunistically swapped the formula using the one that increased their NIMs rather than to transmit the monetary policy changes. This regime had several lacunae. The banks made various *ad hoc* adjustments that included *inter alia*, (a) inappropriate calculation of the cost of funds, (b) no change in the base rate even as the cost of deposits declined significantly, (c) sharp increase in the return on net worth that was out of tune with past track record or future prospects to offset the impact of reduction in the cost of deposits on the lending rate and (d) inclusion of new components in the base rate formula to adjust the rate to a desired level. The slow transmission to the lending rates was further accentuated by the long (annual) reset periods. The expectations from the base rate regimes that these rates will mirror their relative efficiency and cost structure did not fructify.

**Chart 5: Weighted Average Lending Rate of the Bank Group minus Repo Rate**

Source: RBI data plotted by author

### 5.5 Marginal Cost based MCLR Regime:

The lending rate under the MCLR was a sum of the marginal cost of funds and a spread over it. The marginal cost of funds (cost of borrowing plus a return on net worth), wherein the cost of funds was determined by the short-term rate(repo) plus an element to compensate for the negative carry on the CRR, plus operating expenses and a tenor premium. So MCLR had a fully fleshed out formula that permitted tenor linked rates. It was expected to be more responsive to the policy rate changes. However, the banks moved their lending rates very slowly during the rate cut cycles but were faster to pass on the rate hikes during the rate tightening cycles. The MCLR rate had yearly resets

in most banks, this impeded the transmission of the rate cuts. Although the formula was spelt out, it was altered in several ways.

### 5.6 External Benchmark based loans

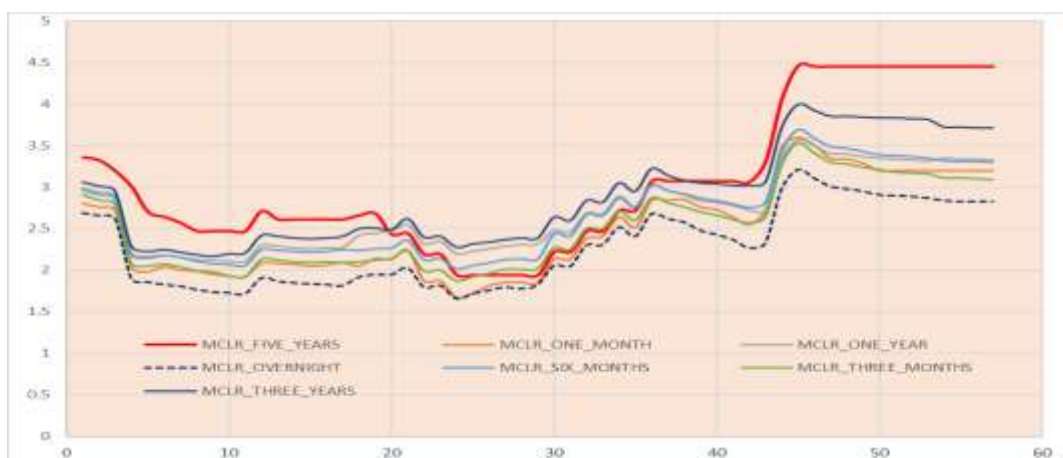
The MCLR regime had several shortcomings, RBI Working group [2017, Chairman: Janak Raj] that was entrusted the task to review the MCLR found (i) the reset period was usually long as one year, this increased the transmission lags. (ii) It was observed that the banks opportunistically used the spread component and raised it when the cost of credit fell. So a large reduction in MCLR was partly offset by a simultaneous increase in the spread in the form of business strategy

premium ostensibly, but actually was used to reduce the pass-through to lending rates; (iii) there was no documentation of the rationale for fixing business strategy premium for various sectors; (iv) Spreads were changed without credit events, in fact many banks did not have a board approved policy for working out the components of the spread charged to a customer; (v) some banks did not have any methodology for computing the spread, and (vi) the credit risk element was not applied based on the credit rating of the borrower. The Working group recommended that banks should use an external benchmark plus spread model. The External Benchmark based loans are expected to usher in greater transparency as the market rates or the policy repo rate could be used as a benchmark to set interest rates on the floating rate loans. The RBI initiated the EBBL after April 2019 the floating rate loans be applicable for the retail segment personal loans and MSME loans the rates on these loans were to be linked by the bank to either the policy repo rate or any other benchmark rate announced by FBIL. The spread over the benchmark rate was required to be announced and remain unchanged through the contract unless there is a credit event or the borrower's credit

assessment undergoes a substantial change. The lending rates should have a quarterly reset for interest rates. During this phase the lending rate regimes changed from Benchmark prime lending rate (BPLR), base rate, marginal cost of lending rate (MCLR). As there was no sunset clause on any of these regimes BPR base rate and MCLR often coexisted with the same bank lending at these differential rates according to the vintage of loans. In order to observe the transmission we first plot the difference between the lending rate and the policy rate across regimes.

### *5.7 Transmission Trends across Tenors:*

It may be seen from Chart 6 that if we only look at the plots of MCLR minus the repo rate, MCLR tenor that is most responsive at overnight, followed by one month tenor and the responsiveness falls with rise in tenors. The MCLR three years is less responsive and the MCLR of five years is the least responsive. While the MCLR minus repo rate is only indicative of how the tenor-based rates we now move to the VAR model based estimation by plotting the Impulse Response Functions.

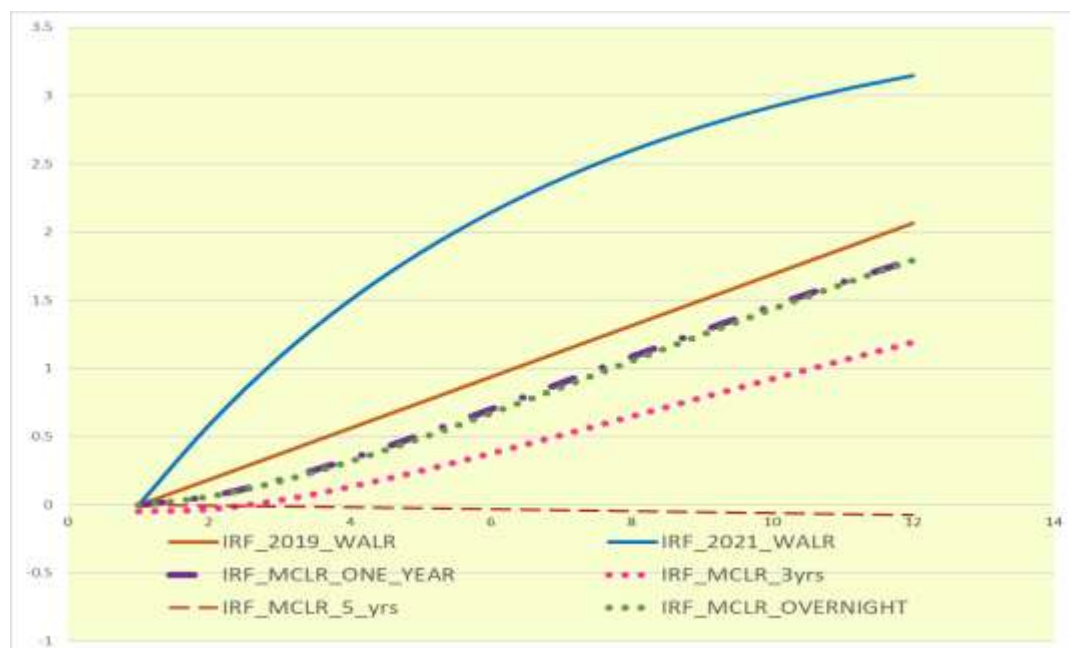
**Chart 6: Tenor-wise MCLR minus Repo rate**

Source: Author's model based empirical estimations.

Accordingly, we run separate VAR models to examine the variation of the transmission across different tenors, these models differ only in the lending rate by considering responsiveness as depicted by the Impulse Response Function (IRF) of alternative lending rate models, see Chart 7.

Here again we find that the lower tenor MCLR's adjust faster than the longer tenor MCLR's. One reason is that these loans are contracted faster than the longer tenure rates which may have a lower fresh

loans component due to higher share of older loan contracts. Alongside the MCLR we have also plotted two models using the weighted average lending rate the model that uses full data till 2021 Q2 (Blue line in Chart 7 below) has shown a higher response than the response generated by the model that ends in 2019 (Red line in Chart 7 below). We observed that the strength of the transmission signal has increased over the recent years after the introduction of the external benchmark-based lending rate.

**Chart 7: Impulse Response Function of Lending Rates to one Std Deviation change in Repo rate**

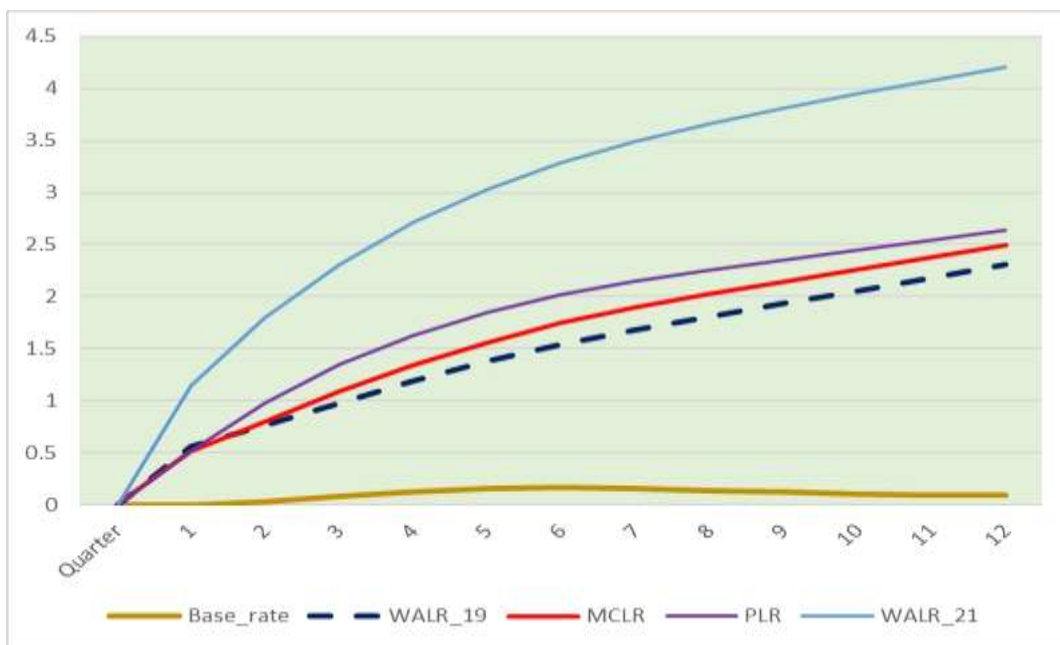
Source: Author's model based empirical estimations using alternative lending rates.

### *Transmission Across Lending Rate Regimes:*

How has the transmission of the monetary policy rate changed over the years is a question that we try to answer. The quantification of transmission during alternative regimes (of the PLR regime, base rate regime, the MCLR regime and the WALR) are compared by through the model-based method by plotting the impulse response from 4 different VAR exercises, in Chart 8 below. Gauging the response of the lending rates by using the impulse response of the lending rate to a

one standard deviation change in the Repo Rate is derived from alternative VAR models for the lending rates under PLR, Base rate and MCLR regimes. We find that the MCLR regime had better transmission of the policy rate signal than the Base rate regime. The weighted average lending rate after the period of the external benchmark rates started the transmission of the policy rate to the weighted average lending rate improved. This is evident from the fact that the model using the full sample data till May 2021 shows the best response.

**Chart 8: Impulse Response of alternative lending Rates to one Std Dev Change in Repo Rate**



Source: Author's model based empirical estimations.

### 5.8 Analysis of Transmission Across Bank groups

Analysis using the Vector Autoregressive models (VAR) are appropriate for studying transmission of monetary signals. We look at Repo rate, output growth, inflation and own rate (WALR) in explaining the changes in the lending rates, see Appendix 1. In this exercise the variance decomposition from the same 4 different VAR models for the (identical period, other variables but different WALRs). When we look at the variance decomposition from the VAR model to

gauge the share of each variable in determining the lending rates. In order to explore the impact of the policy rate change on lending rates of commercial banks during the period 2012 to 2021 a VAR analysis using a set of four variables Growth, Inflation, Repo rate and the weighted average lending rate (WALR) was used for each of the bank group. The difference in transmission or differential response of each bank group to the repo rate can be gauged by using alternative VAR models for identical periods with all other variables being same except for the lending rate which here is the



Weighted Average Lending Rates of the respective bank groups. We run these alternative models and examine the Variance Decomposition Functions for each of the models and plots trace the differential share of the policy rate (repo rate) in explaining variation in the respective lending rates.

When we try to gauge this through the model-based method by plotting the variance decomposition from 4 different VAR exercises. We observe the change in the repo rate is the major cause of movement in the WALRs even after 12 periods, it accounts for 58 % of the variation in PSBs, 50% in Private banks lending rates and 54 % of the foreign banks' lending rates for the All SCBs group the policy rate accounts for 54 % of the variation. Inflation turns out to have more influence on lending rates than the growth variable. The lending rates are also influenced by their past own values (if fixed lending rates were contracted these will continue till expiry, but under a floating rate contract these rates continue only until a reset date). This influence of past rates causes significant

inflexibility in lending rates. Such an impact of older rates wanes as contracts expired over time.

As the external benchmark based lending rate regime was introduced effective April 2019 there that this has very few observations for a model-based analysis. We work around this problem by running two separate VAR models, the first model for full sample of 2012q1 to 2021q2 and a truncated sample of 2012q1 to 2019q2 (before the external benchmark-based regime was initiated). This will enable us to examine whether the transmission has improved after the introduction of this benchmark we compare the impact of the repo rate in the alternative models; the first for the period till 2019 before the external benchmark regime was operationalised and the next for the full period till 2021q2. Chart 9 that gives output variance decomposition of two alternative models the full sample with some data points after this benchmark based lending rate was introduced shows a larger impact of the repo rate on the lending rate (WALR).

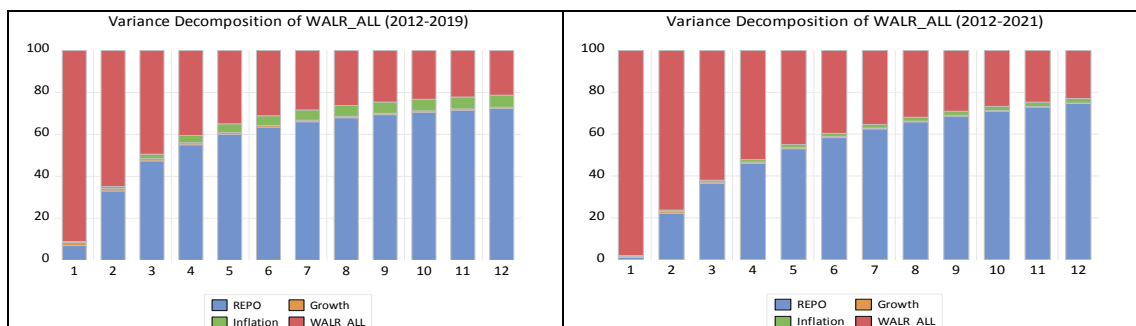
**Table 5: Transmission Across Bank groups Variance Decomposition Results**

VAR 1: Public Sector Banks 2012 to 2021Q2						VAR 2: Private Sector Banks 2012 to 2021Q2					
Period	S.E.	REPO	Growth	Inflation	WALR_PSB	Period	S.E.	REPO	Growth	Inflation	WALR_PVT
1	0.62	82.75	0.00	0.43	16.81	1	0.48	65.85	0.05	0.09	34.02
2	0.77	77.41	0.48	0.37	21.74	2	0.62	64.78	0.12	0.22	34.88
3	0.89	72.43	0.45	1.19	25.93	3	0.73	62.17	0.44	0.23	37.16
4	0.99	69.01	0.42	1.81	28.75	4	0.83	59.86	0.50	0.31	39.33
5	1.07	66.48	0.40	2.26	30.86	5	0.91	57.95	0.57	0.37	41.11
6	1.14	64.51	0.39	2.61	32.49	6	0.98	56.31	0.63	0.42	42.64
7	1.20	62.95	0.38	2.89	33.78	7	1.04	54.90	0.68	0.47	43.96
8	1.26	61.69	0.37	3.12	34.83	8	1.09	53.67	0.72	0.51	45.10
9	1.30	60.65	0.36	3.30	35.69	9	1.14	52.60	0.76	0.54	46.10
10	1.34	59.78	0.35	3.46	36.42	10	1.19	51.65	0.79	0.57	46.99
11	1.38	59.04	0.34	3.59	37.02	11	1.23	50.81	0.82	0.60	47.77
12	1.41	58.42	0.34	3.70	37.54	12	1.27	50.06	0.84	0.62	48.47

VAR 3: Foreign Banks 2012 Q1 to 2021Q2						VAR 4: All Schedule Commercial Banks 2012 Q1 to 2021Q2					
Period	S.E.	REPO	Growth	Inflation	WALR_FB	Period	S.E.	REPO	Growth	Inflation	WALR_ALL
1	0.59	72.82	0.00	0.42	26.76	1	0.53	75.11	0.00	0.41	24.48
2	0.78	69.68	0.58	0.60	29.15	2	0.68	70.87	0.09	0.36	28.67
3	0.93	64.17	0.47	1.56	33.79	3	0.80	66.83	0.19	0.87	32.10
4	1.03	60.77	0.42	2.41	36.40	4	0.90	63.88	0.20	1.36	34.56
5	1.10	58.69	0.38	2.94	37.99	5	0.99	61.66	0.22	1.71	36.41
6	1.16	57.32	0.36	3.28	39.04	6	1.06	59.91	0.23	1.98	37.88
7	1.20	56.36	0.34	3.52	39.77	7	1.13	58.49	0.24	2.21	39.06
8	1.23	55.68	0.33	3.70	40.29	8	1.19	57.32	0.25	2.39	40.04
9	1.25	55.18	0.32	3.82	40.68	9	1.24	56.35	0.25	2.54	40.85
10	1.27	54.80	0.32	3.92	40.96	10	1.29	55.52	0.26	2.67	41.54
11	1.28	54.52	0.31	3.99	41.18	11	1.33	54.82	0.26	2.79	42.13
12	1.29	54.31	0.31	4.04	41.34	12	1.37	54.21	0.27	2.88	42.64

Source: Calculations by the author using identical VAR models for each bank group.

**Chart 9: Variance Decomposition of VAR (2012-2019) and VAR (2012-2021)**

Source: Author's model based empirical estimations

We find that the transmission is the highest for the full sample model taking sample of 2012Q1 to 2021Q2 than the sample that stops at 2019. This indicates that the strength of transmission has increased over the past 2 years. We find that repo rate explained 75 per cent of the variations for the All SCBs group for the full sample 2012-2021 which is more than that which was explained by the repo rate in the variance decomposition of the VAR model with 2012-19 which was at 72 per cent. This shows that the transmission improved in last couple of years. Such an improvement in transmission was in part also due to exceptional circumstances that were caused by a slow credit pick-up and an extraordinary accommodative stance by RBI to enable the economy to cope with the pandemic.

## 6. Conclusions

Over different phases of financial sector development the kind of instruments used by the RBI has varied distinctly; from underdeveloped stage where narrow sectoral instruments till selective credit controls that have sectoral scope were replaced by to more general direct ones like the CRR and SLR being used in the expansionary phase of monetary targeting. Over the years the improvement in market conditions enabled the central bank to use more and more market-based instruments tools. Moreover, even for the same instrument the emphasis on their use changed from phase to phase. The sectoral specific and direct instruments were predominantly used in the operating procedures in the underdeveloped stage, this is followed by the eclectic use of the direct and indirect

instruments in the transitional phase, and the use of more indirect instruments during the developing stage. The developed stage of the financial system can support a greater role of interest rate centric monetary policy signals.

Instrument choice was determined by the state of the financial sector and the economy, e.g., in the monetary targeting regime direct instruments like the CRR were predominantly used alongside the rate variable (Bank rate) and the attainment of reserve money as an operating target was the first step in achieving the monetary target (M3). A further link that was a prerequisite in the monetary targeting framework was the relationship between the monetary aggregate and the price level the loosening of this link required the central bank to operate with different instruments and information variables that was feasible under the multiple indicators approach that was adopted in 1998. Over years the MIA framework enhanced the number of indicators and instruments used there was a large amount of survey-based information that came to be used for policy making and there was also an informal inflation target and an operating target in form of the weighted average call money rate (WACMR). All these elements were building blocks that facilitated the movement to FIT. In several ways the later stage of multiple indicators

approach prepared the economy to move further towards the flexible inflation targeting framework and could quickly transition to inflation targeting after the Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework [Reserve Bank of India, 2014] recommended inflation targeting framework as discussed in this article. Over the years, the transmission of monetary policy rate to market interest rates and lending rate improved. This is primarily because of the rising role and prominence of the interest rate after the financial sector liberalisation. The liquidity management conferred the repo rate with greater role in the central bank's toolkit. Further it has come to occupy the prime role as in the inflation targeting framework. As lending rates were more sensitive of the monetary policy rates their influence on bank lending rates and economic activity and inflation have risen over the years.

Our empirical results show that transmission of the policy rate has increased over years especially after adoption of the external benchmark-based lending rates during the recent years. The impact of the policy rate on lending rates was found to varies across tenors and the state of the economy. Pro-active periodic changes in the monetary policy framework as well as benchmark interest rates in India have enabled better instrument choice over the years. Improving flexibility and control

on the policy rate and other monetary policy instruments across successive monetary policy frameworks and better benchmark lending rate regimes alongside better capitalised banks operating within an economy with deepening of the financial markets and institutions have enhanced transmission of the monetary policy rates to the lending rates.

### NOTES

1. Major findings published in the Report on Currency and Finance, February 2021.

2. Estimating money supply in a financially liberalised economy with a wide spectrum of assets that are different in their 'interest payingness' and 'moneyness', is a challenging job to say the least.

3. This virtual disconnect or 'puzzle' as Reddy [2000] referred to it was the effect of the interplay of various factors. The foremost being the bumper crops of these years that lowered raw material prices and decreased the cost of living. The globalisation and import competition and the positive productivity shock experienced by the Indian economy were the supplementary reasons.

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# **VILLAGE GULUMB IN MAHARASHTRA- COMPARATIVE INSIGHTS FROM 1976 AND 2020 SURVEYS**

Jayanti Kajale

*Village surveys and resurveys are important as they provide insights into the process of diversification a village economy undergoes over a period of time. The focus of this paper is on examining how village Gulumb in Maharashtra State has registered changes during the last forty-five years. The village has a history of repeated surveys conducted by Gokhale Institute of Politics and Economics, Pune since 1930s. This paper is based on insights received from two surveys, i.e., the one conducted in 1976 and the latest conducted in 2019-20. It makes an attempt to understand the nature of diversification that has taken place in the village during the two survey periods in various dimensions of the village. It also analyses household level responses to capture changes in occupational structure and socio economic status of various categories of sample households and their perceptions about problems and challenges faced and the changes they have experienced in the village over a period of time.*

*The analysis indicates the trends observed at the broader level suggesting diversification and development of the village economy have been accompanied by drastic decline in sex ratio, contraction of female population and female workers and hence points at lack of opportunities for this major segment of the economy. Weak economic status of small, marginal and landless households is also highlighted. Along with increasing diversification and commercialization, water needs of the village have also been increasing. The village still faces problems relating to sanitation infrastructure and management. The changes taking place in the village will be influencing future course of its development and without interventions, may increase extent of migration, problems faced by elderly population and higher rates of unemployment and vulnerabilities in case of women, marginal landholding households and landless households. Hence policies need to be devised keeping in view the changes which would take place in future in age structure of population, educational attainment and in the occupational structure and composition in the village.*

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This paper is largely based on the survey conducted in 2019-20 in village Gulumb and the report based on the same and submitted to the Union Ministry of Agriculture and Farmers Welfare in January 2021. The author duly acknowledges the support provided by the Ministry for the study.

## SECTION 1

### 1.1 Introduction

An important feature of economies across the globe has been the increasing level of urbanization. A report of the United Nations reveals that greater proportion of populations, i.e., 55 percent was residing in urban areas than in rural areas for the first time in 2018 [UN, 2019]. This, therefore, underlines the importance of studying the conditions of cities and urban living. However, still a large section of the population i.e. 45 percent resides in rural areas. Given the changing structure of populations, across rural and urban areas, there arises a need for a study of changes taking place in villages too. As per the above-mentioned UN report, the populations residing in rural areas mainly include those of the countries of South Asia and the sub-Saharan Africa region and earn their living primarily from the agricultural sector. In view of the challenges faced and objective of poverty reduction and attainment of a higher level of growth, transformation of the rural and agricultural sectors of these economies and therefore of the villages is considered to be essential. Transformation would be broadly considered to mean diversification of rural areas into non-farm activities and reduced dependence on the agricultural sector. It also indicates

employment of resources into high productivity sectors and culminating in changes in the occupational structure. However, these changes do not take place in isolation. Expansion of public infrastructure and changes in demographic conditions aid the process of rural change and encompasses different aspects of village life.

In the case of India, the share of the rural population which was 80 percent of the total population in the 1960s has been reducing gradually over a time period. However, even today a massive proportion of the total population - around 69 percent- resides in more than 6 lakh villages of rural India. As per a study undertaken for the NITI Ayog about half of the national income and more than two thirds of the total employment was generated in rural areas. Also, apart from producing almost all agricultural output, rural areas contributed about half of the manufacturing and construction sector output and one quarter of the service sector output in the country [Chand, et al., 2017]. However, this study also observed that the rural areas were characterized with lower levels of worker productivity indicating slower pace of shifting of resources and employment generation. In view of such observations, it is important to study how the villages have been changing or developing over a period of time. An enquiry into this process of



change in villages provides us insights about various aspects of their diversification *vis-à-vis* changing needs of village population. Based on these insights, short and long-term policies could be formulated.

In order to understand the nature of changes taking place in the agricultural sector/ occupational structure of the villages over a period of time, a number of village surveys have been conducted. These have highlighted how village institutions, infrastructure, household characteristics and pattern of livelihoods have undergone change over a period of time. One of the early resurvey studies was undertaken by the Indian Society of Agricultural Economics for comparing the surveys of village Bhadkad in Gujarat (erstwhile Bombay state) conducted in 1915 and then in 1955 [ISAE, 1957]. It indicated the stark reality of very low progress in the economic as well as social spheres and very slow pace of change during the period of nearly 40 years including thirty years of the pre independence era. A number of studies have been undertaken later which analysed changes taking place on the backdrop of overall increasing scale and extent of commercialization, expanding services of government institutions and development of village infrastructure in the post-independence period. These studies made an attempt to understand the drivers

of change in the villages, various survival strategies of village households and overall structure of the village economy. One such study was a resurvey (first held in 1957-58 and then in 1980-81) of a cluster of villages in the Chikmagalur district of the State of Karnataka [Gajajaran, 1983]. The study noted the phenomena of occupational diversification and gradual integration of villages with the urban sector. In other words, the village cluster was being transformed from a state of stagnancy into a dynamic one by 1980-81. Studies based on a survey of villages of 4 southern states revealed diverse patterns of transformation as well as pace and direction of change [Rao and Nair, 2003]. The survey undertaken in 2004-05 and the recently undertaken resurvey in 2014-15 of one village of Uttar Pradesh revealed the rise of rural non-farm economy, growing educational opportunities and increasing mobility across caste and community [Kumar, 2016]. Overall, the studies have noted broad changes in the institutional and infrastructure facilities, land ownership and land use patterns, population size and migratory patterns, gender equations, income levels etc. It is clear that village life in the current scenario is drastically different from that in 1950s. The villages have thus witnessed reduced importance of agriculture as a livelihood source, increasing occupational diversification,

increasing extent of education and also fading distinction between villages and cities in some respects [Simpson, 2016].

## 1.2 Background of the Study

Considering the importance of diversification of activities in rural areas, the focus of this paper is on examining the how village Gulumb in Maharashtra State has registered changes during the last forty five years. A village with a population of more than 3000, Gulumb is situated in Wai taluka in Satara district of Maharashtra and had more than 700 households as per the census 2011. There is a history of repeated surveys - farm business as well as socio-economic surveys conducted by Gokhale Institute of Politics and Economics, Pune since 1930s. Between 1936-37 and 1976, i.e., over a period of 40 years, the village households were studied through more farm business surveys as well as comprehensive population surveys. A socio-economic survey was conducted in 1976 [Dandekar, et al., 1978]. It presented an excellent account of the evolution of the village settlement and land ownership patterns, impact of land reforms, progress of the agricultural sector, occupational pattern in the village over a period of time. It also discussed the socio-economic status of households as well as socio economic relations among various

categories of the households and the overall development process in the village.

In order to record the changing structure of the village and village households, a study was conducted and a survey was undertaken by the present author in the year 2019-20 [Kajale and Suryawanshi, 2021]. The present paper is based on insights received from these two surveys i.e. the one conducted in 1976 and the latest conducted in 2019-20. It makes an attempt to understand the nature of diversification that has taken place in the village in the last 45 years in various dimensions of the village economy such as availability and expansion of facilities and infrastructure, occupational and demographic structure and major changes in the agricultural sector during last forty five years. It also analyses household level responses to capture changes in occupational structure and socio-economic status of various categories of sample households. The perceptions of households about problems and challenges faced and the changes they have experienced in the village over a period of time and their recommendations are also studied. Finally, the paper discusses the need for inclusive expansion and transformation and extends policy suggestions based on the analysis.

### 1.3 Methodology

The paper is based on secondary as well as primary data. The Primary Census Abstract of district Satara for the years 1981 and 2011 (which are the census years closest to the survey years - 1976 and 2019-20, respectively) were used for mapping changes in the infrastructure in the village. The 1978 report [Dandekar et al., 1978] based on survey conducted in 1976 was the other major secondary data source. It mainly focusses on historical evolution of various village institutions/ phenomena. The discussion in this report is largely qualitative in nature. Nevertheless, it provides rich insights and broad trends in different aspects of the village life and socio-economic status of the households. It can be noted that the 1976 survey [Dandekar, et al., 1978] included the village population in some respects and sample households sometimes for the analysis. The survey conducted in 2019-20, however, is based on a sample of 400 households from the village. It is against this background that the study uses a comparative approach. Firstly, it compares the secondary data from available census reports and secondly, it looks at comparable results of the field surveys based on the 1978 report and the results of 2019-20 survey.

During the latest survey, village level information was collected from the office of gram panchayat, state government officials such as agricultural assistant, elected representatives and experienced and knowledgeable villagers through interviews and group discussions. Household level information was collected through a structured schedule. 400 households out of a total of around 769 households were selected. The information collected pertained to demographic features, occupational/ livelihood pattern, educational status, income and expenditure of the village as a whole and of selected households. Information was also collected on perception of the households about problems faced by them and their views about rural change. The information was analysed for categories of households by land size. The field survey was conducted over a period of three months between December 2019 and February 2020. The rest of the paper is structured as follows: Section II discusses the changing characteristic features of the village during two census time periods- 1981 and 2011 and the year of the latest survey 2019-20 while Section II analyses the household level data. Further, Section III discusses the overall nature of change that the village has undergone over the period of time. The last Section presents conclusions and policy suggestions based on the findings of the study.

## SECTION II

### 2.1 The Changing Characteristics of the Village - 1981 and 2020

As mentioned in the 1978 report, village settlement is six to seven hundred years old and mainly comprises of households of Yadavs and Jadhavs belonging to Maratha community which is one of the dominant castes in Maharashtra. However, it is not known clearly as to when and wherefrom these groups came to Gulumb for settlement. Over a period of time, the isolated and self-sufficient nature of Gulumb went on changing and by 1976, the dependency on the outside world and monetization of transactions increased. This Section attempts to map the available infrastructure in the village at three points of time- 1981, 2011 and 2019-20. Table 1 shows how the availability of basic public and private infrastructure went on changing during this period. The village in 1981 had public taps, hand pumps and wells for provision of drinking water. By 2020, each household had provision of piped water supply. Similarly, the village had electricity in 1981 and by 2020, it was a 100 percent electrified village. Earlier, the village had a kuccha approach road, however in 2011, it had a pucca road. It did not have and still does not have a

landline as a means of communication and the households depend upon mobile phones for communication. The village did not have easy access to banks and credit society in 1981. However, by 2011 there was an agricultural credit society within the village and banks were present within a distance of 5 kilometers from the village. Though not mentioned in the census report, the village had a multi-purpose cooperative credit society that was established in 1930 [Dandekar, et al., 1978]. The village does not have an Agricultural Produce Marketing Committee (APMC) market, however, one exists in nearby towns. The village now has a ration shop, anganwadis, sports ground and public library which did not exist in 1981. The village also has an ICICI bank ATM machine which was installed in the village after the field survey and in the month of August 2020.

Table 2 shows the expansion of basic public and private health infrastructure in the post 1981 period. The village now has a primary health centre, veterinary hospital, private medical practitioners and a medical shop also. The village had primary and secondary schools in 1981. There was an expansion in the educational institutions and in 2020, the village had anganwadis and a junior college within a distance of 10 kilometers.

**Table 1. Availability of Public and Private infrastructure in the Village - 1981-2020**

	Census Year	Census 1981	Census 2011	Survey 2020
1.	Drinking Water	Tap, wells, hand pumps	Tap, wells, hand pumps	Provision of piped water supply for all households, open wells, bore wells
2.	Post and Telegraph	-	-	-
3.	Electricity	yes	yes	100 percent electrification
4.	Approach to village	Kuccha road	Pucca road,	Pucca road,
5.	Transport	Bus Stop	Bus Stop	Bus stop and other private vehicles
6.	Means of communication	-	-	No Landline, Usage of mobile
7.	Market	nearby towns/taluka	nearby towns/taluka	nearby towns/taluka
8.	Commercial and Cooperative Bank	-	Available (within 0-5 kms) since 2001	Available (within 0-5 kms)
9.	Agricultural Credit Society	-	1	Primary Agricultural Credit Society: 1 District Agricultural Credit Society: 1
10.	Ration shop	-	-	-
11.	ATM	-	available (5- 10 kms)	ICICI Bank ATM started in August 2020
12.	Cinema/ Video Hall, Internet cafes, Common service centre, Sports club	-	Available within 10+ kms	Available within 10+ kms
13.	Play ground	-	-	Yes
14.	Public Library	-	Yes	Yes

Source: 1. GOI [1981 and 2011]

2. Field Survey conducted by the author, 2019-20.

**Table 2. Health Infrastructure in Gulumb: 1981-2020**

		1981	2011	2019-20
1.	Allopathic Hospital	-	Available (10+km)	Available (10+km)
2.	Maternity Home	-	-	-
3.	Primary Health Centre	-	Sub centre	Sub centre
4.	Registered Private Medical Practitioner	-	1	2
5.	Medicine Shop	-	1	1
6.	Veterinary hospital	-	Available (within 0-5km)	Government sub centre
7.	Pre-Primary School (Anganwadis)	-	5	4
8.	Primary school	1	2	1
9.	Secondary school	1	1	1
10.	Senior Secondary School (PUC)	-	Available (within 0-5km)	Available (within 5-10km) (within 5-10km)

Source: 1. GOI [1981 and 2011]

2. Field Survey conducted by the author, 2019-20

## 2.2 The Demographic and Occupational Structure in the Village

An important aspect of the village is its demographic and occupational composition. Table 3 shows that the population of the village increased by 23 percent over the census period. The share of females which was around 55 percent in total population however reduced to 49 percent in 2011. Over the two census years, the number of total (main and marginal) workers increased by 6 percent over the years. Its composition shows that

most of the workers were main workers in both the years and therein, share of marginal workers was higher for male as well as female workers in 2011. It is also revealed that increase in total main workers was driven by male workers. Overall, the demographic changes show that unlike in the case of males, share of female non workers increased and the share of total female workers in population and female main workers in total workers reduced. Thus, share of marginal workers increased. Table also reveals drastic reduction in sex ratio. It is thus

revealed that the demographic change in important segment of population and of the village led to contraction of the workers - the females.

**Table 3. Demographic Profile of Village Gulumb: 1981 and 2011**

Particulars	1981			2011			% Change in Total Number
	Male	Female	Total	Male	Female	Total	
Total Population	1361	1633	2994	1597	1595	3192	22.58
(Share of M and F in total (%))	(45.45)	(54.54)	(100)	(50.03)	(49.97)	(100)	
Non workers (% of total population)	43.57	31.47	37	41.77	58.43	50.09	6.81
Total workers (number)	609	888	1497	930	663	1593	6.41
Main workers (%)	99.34	94	96.19	95.27	81.47	89.52	-0.97
Marginal Worker (%)	0.66	6	3.81	4.73	18.53	10.48	192.98
Sex Ratio		1200			999		

Source: Government of India, [1981 and 2011].

Classification of workers for the census years 1981 and 2011 reveals that the classification was largely similar for both male and female workers in 1981. However, the 2011 data shows considerable difference in the same. The overall share of other workers was very low for both male and female workers in 1981. It increased by 5 times in 2011 implying diversification of the workforce into nonfarm sector. However, this diversification could not absorb substantial

female workforce into the non-farm sector and therefore in 2011, still 85 percent of the female workers and therefore overall 73 percent of the total agricultural workers were engaged as agricultural workforce. The diversification of the workforce therefore was a phenomenon driven by male non-farm sector workers as is clear from this Table given below.

**Table 4. Industrial Classification of Workers in Gulumb: 1981 and 2011**

(In percent)

Particulars		1981			2011			% Change in Number of Total Workers
		Male	Female	Total	Male	Female	Total	
1.	Cultivators	73.16	77.91	75.67	50.90	55.74	52.73	-26.49
2.	Agricultural Labourers	18.56	18.45	18.49	15.80	29.26	20.90	19.2
	Total Agricultural Workers	91.72	96.36	94.16	66.7	85	73.63	
3.	Other workers (nonfarm)	8.28	3.64	5.84	33.30	15	26.37	351.54
Total Workers		100	100	100	100	100	100	

Source: GOI [1981 and 2011].

Discussions with village officials during the latest survey revealed that a majority of the households were land-owners and cultivated their land. Also, a majority, i.e., more than 50 percent of the households were marginal and small land holders with less than 2 hectares of land. Therefore, most of them had secondary sources of income also. With the older generation staying in the village and managing the household farms, the younger generation members in well to do families have permanently migrated for education and employment. Discussions also revealed that some of the younger generation members staying in the village had their own businesses such as transport related activities. Some of the household members were also working in nearby industries while some of the villagers worked in the service sector such as in restaurants at taluka places or

nearby towns and commute daily for their work. Also, through a number of Self-Help Groups (SHGs) working in the village, the women members were engaged in jewelry making, chulha making, tailoring etc. It was also revealed that while there were a number of cane crushing and jaggery units in the village around 1980s and provided employment to the villagers, however, with the passage of time, their number reduced.

The 1978 report reveals that dependence of majority of the households on agriculture for livelihood and the declining size of landholding witnessed migration of the villagers to the cities. This was facilitated due to development of transport infrastructure of the village connecting it with the urban areas. The number of migrant earners increased



from 203 in 1942 to 479 in 1976. Discussions during the latest survey of 2019-20 also revealed the phenomenon of migration. Apart from those who had migrated permanently, a number of household members were engaged outside the village on daily basis either in factories/ production units or in service sector, however had their base in the village itself.

## **2.3 The Agricultural Sector and Diversification**

### *2.3.1 Land Distribution Pattern*

Coming to the distribution of land-holdings it was seen that in 1976, around 72 percent of the total land was under medium and large farms which formed 32 percent of the total number of holdings. The rest of the holdings were marginal and small. The data collected during the current survey showed that around 24 percent of the area was under medium and large farms which formed 12 percent of the total land holdings. This shows that the number of marginal and small farms increased over the time period mainly due to fragmentation. In both the years, it was observed that more than proportionate area was under the medium and large farms.

### *2.3.2 The Land Use and the Cropping Pattern*

Developments in the agricultural landscape of the village such as availability of water and credit, increasing extent of cultivation and marketing of commercial crops and allied activities etc. are expected to strengthen demand for various inputs and supply of agricultural goods and therefore backward and forward linkages as well. The available records shows that cultivable land declined marginally to 873 (ha) hectares in 2018-19 from 880 ha in 1976. However, the irrigation infrastructure expanded and the percentage area irrigated which was merely 15 percent in 1976, increased to 52 percent in 2018-19. Thus, there was a remarkable increase in area under irrigation over the concerned period. This was possible due to the expansion in the irrigation infrastructure.

The main crop cultivated in 1976 was jowar which occupied 51 percent of the land under cultivation. Other main crops were bajra, groundnut, matki, sugarcane and beans and together these accounted for around 80 percent of the cropped area. Over the concerned period, share of jowar declined to 26 percent, whereas that of beans, groundnut, wheat, gram and sugarcane and maize increased. These crops contributed around 70 percent of the total cropped area in the year 2018-19. Beans

has been a traditional pulse crop in the village and its share has increased considerably. Area under sugarcane also recorded an increase from 4 percent to 7 percent. The crops which were not recorded in 1974 but were cultivated in 2018-19 were soybean, maize, green pea, fruits and ginger. This change reveals that the villagers have been gradually shifting their cropping pattern to a more commercial and high value cropping pattern. Data on yields of various crops could not be compared as the 1978 report does not present the same for the year 1976.

The data on livestock (Table 5 below) in two periods of time shows that the number of cows increased by around 45 percent during 1976 and 2012. Also, probably in 1976, all the cows were

indigenous. As per 2012 census data (provided by the Agricultural Assistant of the village) however, around 96 percent of the cows were of hybrid type. The numbers of bullocks, buffaloes and sheep has drastically reduced. However, the numbers of goats and poultry birds increased. This is a major change and indicates importance of demand driven supply of livestock products especially poultry products.

It is thus clear that between the two survey periods, the cropping pattern changed, irrigation infrastructure expanded and the movement towards allied activities increased indicating commercialization and diversification of the sector.

**Table 5. Livestock in Gulumb: 1976 and 2012**

1976			2012*		
1.	Cow	226	Cows	501	Indigenous: 20      Hybrid: 481
2.	Bullock	259	Bullocks	16	Indigenous: 11      Hybrid: 5
3.	Buffalo	227	Buffaloes	175	Male-6 Female- 169
4.	Sheep	400	Sheep	71	
5.	Goat	177	Goat	345	
6.	-		Hen(indigenous)	997	
7.	-		Hen (poultry farm)	15000	

Note: \* village level data collected for the livestock census, 2012

Source: 1. Dandekar et al. [1978] for the year 1976

2. Agricultural Assistant, Gulumb, during field survey conducted by the author, 2019-20.

### SECTION III

In order to understand change in the demographic and socio-economic characteristic features of the village households, an attempt is made in this Section to compare these features of the households during two survey periods based on the data that was useful for comparison.

#### 3.1 The Characteristics of Households in Gulumb- 1976 and 2020

##### 3.1.1 The Demographic Profile

A comparison of the household characteristics as revealed from household surveys conducted in 1976 and in 2019-20 reaffirms the changes in the demographic and occupational patterns that were revealed from analysis of the census data. Table 6 shows that the percentage of population above 06 years increased from 82 percent in 1976 to

around 94 percent in 2019-20 and is indicative of preference for having lesser number of children per family. Average age of family members of sample households was around 25 years for males and 28 years for females in 1976. In 2019-20, it was around 37 years for both males and females. The data reveals an increase in the life expectancy of household members, preference for smaller families and lesser number of children. In 1976, 57 percent of the members were females and the rest were males. In 2019-20 survey it was found that 47 percent were the female members and 53 percent were male members. Sex ratio also declined. There were 1227 females per 1000 males in 1976. This proportion, however, reduced considerably to 945 females in 2019-20. These observations are in accordance with features of population revealed from analysis of the census data as presented in the earlier section.

**Table 6. Characteristic Features of the Sample Households**

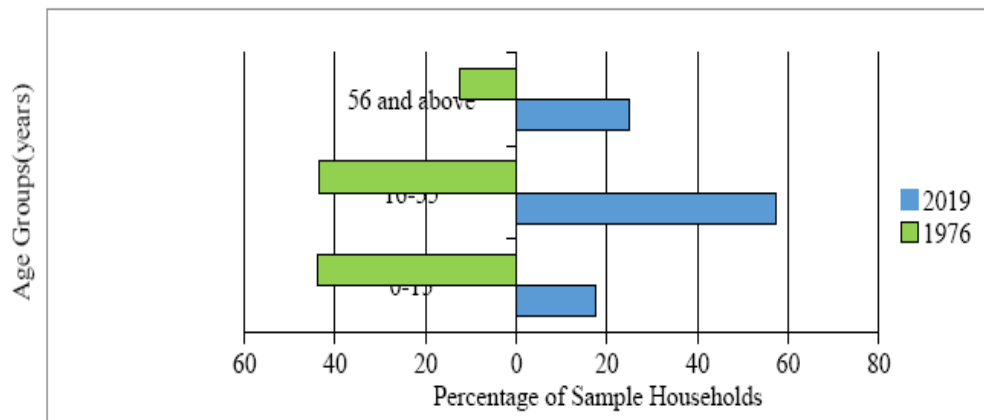
		1976		2019-20	
		Male	Female	Male	Female
1.	Members above 06 yrs. (%)	78.45	82.27	93.02	94.46
2.	Average age of family members (Yrs.)	25.70	28.04	37.37	37.86
3.	Sex wise distribution of family members (%)	42.82	57.18	53.34	46.67
4.	Average size of the family (No)	5.24		4.66	
5.	Sex Ratio	1227		945	

Source: 1. GOI [1981 and 2011]

2. Field Survey conducted by the author, 2019-20.

Figure 1 given below shows the age structure of the households. It shows comparatively lower share of 0-15 age group and higher share of other two groups and indicates increased awareness about importance of smaller families and increased life expectancy. The figure shows more than 55 percent of household members into the productive age group of 16 to 55 years in 2019-20 as against 43.47 in 1976. It also brings out higher share of population above 60 years in the population structure during 2019-20 as compared to the earlier survey.

**Figure 1. Age Structure of Total Household Members in Gulumb, 1976 and 2019-20**



Source: 1. GOI [1981 and 2011]

2. Field Survey conducted by the author, 2019-20

Table 7 shows distribution of population by marital status in the two reference years. It shows that 82 percent and 17 percent of the married population belonged to age groups 7-16 and 17-36 in 1976 respectively. A comparison with the corresponding age groups in 2019-20 shows that none from the former age group had got married and only 10 percent of the married members belonged to the next, i.e., 16-30 age group. Difference is also observed for unmarried household members. In 2019-20 survey, out of the

unmarried members, most of the members were concentrated in first two age groups out of which 42 percent were in the 7-16 age which is indicative of preference for delayed age of marriage. The 1976 data however shows that less than one percent of the total unmarried members were there in the above age group. Table clearly indicates change that has taken place over the period of time in perception of the households relating to also marriageable age.

**Table 7. Distribution of Population by Age and Martial Status in the Village Gulumb, 1976 and 2019-20**

(in percent)

		1976		2019-20	
Age Groups		Married	Un-married	Married	Un-married
1	7-16	82.4	0.7	0.18	42.66
2	17-36	17.0	44.4	27.65	53.86
3	37-56	0.5	36.5	41.57	2.32
4	57+	0.1	18.5	30.60	1.16
All age groups		100.0	100.0	100	100

Source: 1. GOI [1981 and 2011]

2. Field Survey conducted by the author, 2019-20

### 3.1.2 Educational Status

It can be seen from Table 8 that overall whereas around 32 percent of the household members were illiterate in 1976, this percentage was merely 13 percent in 2019-20. Out of the educated population, majority of the members across categories were educated up to primary level in 1976. In 2019-20 however, highest share- around 30 percent was of members who had completed education up to secondary level. It is also observed that 16 percent of the members had reached intermediate level as well as graduate level. These figures are far

higher than those for 1976. An interesting observation is that the difference in the level of education between male and female members was substantial in 1976. It however reduced considerably by 2019-20. A comparison of 1981 census figures with 1976 survey figures however shows a gap between the two estimates. Whereas as per the census estimates, percentage of total literate population was 54.14 percent in 1981, it was higher - 64.75 percent as per the survey conducted in 1976. In 2011, it was 86.08 percent and 91.8 percent as per the current survey.

**Table 8. Level of Education of the Household Members, 1976 and 2019-20**

Education level	1976			2019-20		
	Male	Female	Total	Male	Female	Total
1 Illiterate	15.5	50.3	32.20	8.33	18.16	13.10
2 Primary	53	42	47.72	19.17	24.70	21.85
3 Secondary	15.4	4.5	10.17	30.31	31.34	30.81
4 Intermediate	10.1	2.2	6.31	20	12.07	16.16
5 Technical/ graduates/post graduate/ professional	6	1	3.6	22.19	13.73	18.08
Total	100	100	100	100	100	100

Source: 1. GOI [1981 and 2011]

2. Field Survey conducted by the author, 2019-20

### 3.1.3 Classification of Main Workers

Table 9 gives data on the classification of main workers. It is observed that more than 80 percent of the workers in Gulumb were cultivators followed by agricultural labourers (15 percent) and other workers (11 percent) in 1976. This distribution is almost similar to the distribution of main workers as per census 1981 as was observed earlier. In 2019-20 however, it was observed that around 50 percent of the total workers were cultivators and share of other workers was 37 percent. In

case of male workers, share of other workers was almost 42 percent and that of female workers was around 23 percent. Still around 59 percent and 76 percent of the male and female workers respectively were dependent on agriculture during 2019-20. A comparison of 2020 data with the census 2011 data (Table 4) shows that share of cultivators was almost same in both the years. However, share of agricultural labourers was less and that of other workers was more in the year 2019-20.

**Table 9. Classification Main Workers in Gulumb**

Particulars	1976			2019-20		
	Male	Female	Total	Male	Female	Total
1 Cultivator	68.81	77.19	73.98	49.73	55.55	51.23
2 Agricultural Labourer	10.87	17.55	14.98	8.58	21.71	11.96
3 Other workers	20.32	5.26	11.04	41.69	22.74	36.81

Source: Dandekar et. al., [1978] and Author's field surveys (2019-20)

### 3.1.3 *Economic Status of the Sample Households in Gulumb*

Comparable data relating to income of the households could not be obtained from the survey conducted in 1976. However, the 1978 report clearly states that there was no occupational diversification in the village. The declining size of land acted as a constraint to expand into allied activities for majority of the households. Also, a number of caste-based functionaries, artisans were being dislodged due to the declining demand for their services. The households thus depended mainly on income from cultivation or working as agricultural labour. The report indicates that the bigger size land owner households were economically well off and had better access to resources and were economically as well as socially dominant households of the village. For the year 2019-20, the data shows that income from non-farm sources contributed largely to the total income of all households. This pattern was similar to the income pattern of overall households as almost 75 percent of the sample households were landed households. This again reveals role of non-farm income in supporting livelihood of the landed households. It was observed that the marginal farmers and the landless workers in the village mainly survived on the income earned through non-farm activities. This share was 82

percent and 95 percent for marginal and landless categories respectively. However, in absolute terms, the level of total average income earned by these categories was very low as compared to other categories, especially the highest land size category. The average number of sources of income were lowest, i.e., 3 for marginal category and highest, i.e., 6 for the landless category. This can be seen from the following Table 10.

The 1978 survey report analyses the composition of consumption expenditure of the households. It notes that the food items absorbed about 60 per cent of the total annual consumption expenditure and cereals and pulses accounted for half of this expenditure. For year 2019-20, the share of total expenditure that was spent on food items was around 38 percent out of which 10 percent was spent on food grains. The rest of the expenditure under food items was on livestock and horticultural products and other food, i.e., processed food. In 1976, under nonfood expenditure, clothing claimed about 10 per cent of the total expenditure and fuel and lighting contributed 7 per cent of the expenditure. In 2019- 20, 4 percent and 11 percent of the total was expenditure was on clothing and fuel and electricity, respectively. The major two items of expenditure in 2019- 2020 were education and medical. Combined share of expenditure on these was 28 percent. The

2019-20 data revealed that majority of the classes were from the marginal and households which belonged the two landless households as well as Scheduled lowest monthly per capita expenditure Castes and Muslim households.

**Table 10. Land Size wise Economic Status of the Sample Households in Gulumb**

Particular	Household Category				
	Marginal	Small	Medium and above	Landless	All
Share of households (%)	75	12.25	5.25	28.75	400
1 Percentage of Total Income from Farming	15.04	28.17	28.73	-	15.68
2 Percentage of Total Income from off Farming	2.76	3.89	0.56	5.18	3.01
3 Percentage of Total Income from Non Farming	82.20	67.94	70.70	94.82	81.31
4 Total Income	100	100	100	100	100
5 Average annual income from farming and off farm (Rs)	27,597.21	47,008.16	1,59,795.24	6260.87	30781.25
6 Average income from Non-farm (Rs.)	1,27,420.98	99,638.78	3,85,666.67	114627.81	133897.5
7 Number of Sources of income	3	4	5	6	

Source: Based on Author's field surveys (2019-20)

The 1978 report mentions the availability loans for short term consumption purposes as well as for long term investment. However, data on extent of borrowings of households was not collected during 1976. Details of borrowings for the year 2019-20 showed that out of those households which took loan for agricultural purposes, around 65 percent were marginal farmers. It was also seen that most of the households which took short-term and medium-term loans were marginal households. The share of medium and large category households was lowest in case of short-term loans and

highest in case of long term loans. The data reveals the ability of the larger farm size households to take long term agricultural loans and make investments for improvements.

For observing the factors that are correlated with land size, coefficient of correlation was found out between size of landholding of the households and income, expenditure, saving borrowing during the latest survey. The coefficient of correlation was closer to 1 in case of income and expenditure indicating positive but weaker relationship due to factors



such as variability in income and expenditure reported. It was greater than three in case of borrowing and greater than 4 in case of saving and revealed relatively stronger positive relationship as compared to the earlier case. This indicated more possibilities of growth in case of households with bigger land size.

Both the surveys revealed that in the case of marginal farmers, very small size of landholding and limitations to having more sources of income led to lower income from farming and non-farm sources, lower consumption expenditure and inability to make investments in land.

### **3.2 Major Problems Perceived by the Villagers, Officials and the Sample Households**

#### *The 1976 Survey*

The 1978 report observed gradual withering away of the barter system and monetization of the village economy. Reduction in the caste based and artisan related occupations and increase in the number of agricultural labourers was also observed. The reducing size of the landholdings made it difficult for the marginal land-owning households to earn adequate income. The village provided a cushion and social insurance to those who got integrated into the urban/industrial system. This however stressed the need

for expansion of non-agricultural sector and creation of adequate means for settlement in the urban sector. The Report also dealt with broader issues relating to intra village and intra household hierarchical social relations. Particularly, it indicated the secondary role played by women within the household and barriers faced by them to enter into the non-farm economy and urban sectors as workers due to the traditions relating to gender.

#### *The 2019-20 survey*

During the 2019-20 survey, it was revealed by the village officials that non-availability of jobs/ adequate employment opportunities in the village was the major problem which was leading to migration and shortage of agricultural labourers. Drought was another major problem which not only affected incomes but also education of children. Inclusion of the village in the category of Drought Prone Areas, usage of solar energy for electricity generation on farms/ in the village, impetus to farm mechanization, development of farm implements and tools, establishment of an industrial estate near the village were some of the major suggestions given by the village officials for tackling problem of unemployment and for overall development of the village.

The sample households were also asked about major problems faced in the village and the solutions to the problems according to them. About 11 percent of the households felt that cleanliness and a weak drainage system were major problems facing by the villagers. This was in spite of implementing schemes such as Nirmal Gram Yojana. It can be noted that this problem existed during earlier survey also and was discussed in the 1978 Gulumb report and still persists even after 45 years also and thus needs the attention of the concerned local authorities. Poor quality of village infrastructure, water scarcity, unemployment, destruction of farms by wild animals were other problems reported by the households. Hence, the need for more and better infrastructure such as better roads, continuous electricity supply, hospital in the village, good school, adequate water supply of water was emphasized by the households.

During the 2019-20 survey, households were also asked about their perception regarding changes taken place in the village over a period of time. More than 80 percent of the sample households felt that the condition of the villagers had improved and that the village had experienced positive infrastructure development. The households were also asked if there was any change in the economic condition of their household and in the

agricultural sector of the village. A little above 60 percent of the households reported in this regard that there was a positive change over the time period. The rest, i.e., around 40 percent of the households felt that there was no change or the that there was deterioration. Thus, most of the households (80 percent as mentioned above) felt that villagers / village as a whole had experienced positive change. However, when particularly asked about condition of their households as well as the agricultural sector, lesser proportion of the households - around 60 percent felt that positive change had taken place. 40 percent of the households did not feel that there was any improvement.

Through group discussions, it was revealed that the occurrences of drought, erratic rainfall and heat wave had increased. During the 5 years preceding the reference year, drought was experienced 4 times. It was felt that almost all the farmers and all the crops had suffered due to the drought. It had not only affected crops and the farm income but also the education of children as scarcity/non availability of water had affected daily routine of the households. Discussions revealed that the coping strategies adopted especially by the lower income groups were borrowing, using savings or

temporary migration in search of livelihood opportunities, taking loans for satisfying consumption expenditure. Some of the households also resorted to leaving livestock with relatives when it was absolutely impossible financially to feed the animals. At the village level, usage of water tankers and acquisition of private wells in the village was resorted to. A long-term project of linking streams was also taken up by the village in collaboration with the government and private sources. It was hoped by the villagers that this water and recharge of groundwater due to this would be helpful in providing adequate water to the village at least for next two years.

#### SECTION IV

##### **Is the Change Pervasive and Inclusive?**

On the whole, the analysis of the village data based on the two surveys indicates that there has been substantial expansion of civic infrastructure, increasing extent of education, diversification of occupational pattern, changes in the cropping pattern and increased extent commercialization of agricultural sector. Also, the ability of an average village household to spend on variety of items of expenditure as compared to the earlier survey year was also revealed. The village households thus have been increasingly getting connected with wider markets for inputs, goods and

services. This reveals strengthening of rural urban ties. These phenomena reveal changes in the structure and diversification as well as prosperity of village economy over the past 45 years and suggest its *transformation*. However, it is interesting to note that the caste composition, village settlement pattern, structure of hierarchy, social representation in political structure, land distribution pattern have almost remained the same at the village level between the two surveys. Also, the trends observed at the broader level suggesting transformation have been accompanied by a drastic decline in sex ratio, contraction of the female population and female workers and hence points out to a lack of opportunities for this major segment of the economy. Along with increasing diversification and commercialization, water needs of the village have been increasing and hence the villagers and authorities have been demanding inclusion of the village in the Drought Prone Area Programme. Incidence of climate related contingencies has also increased. The village still faces problems relating to sanitation infrastructure and management. Though the overall trend suggests structural change, diversification and expansion of the village economy into nonfarm sector during the 45 years, it also raises questions relating to issues of inclusivity and many dimensions where limited progress has taken place.

## SECTION V

**Conclusions and Policy Suggestions**

The changes taking place in the village will be influencing future course of development of the village and, without any policy interventions, may increase extent of migration, problems faced by elderly population and higher rates of unemployment and vulnerabilities in the case of women, marginal landholding households and landless households. Hence policies need to be devised keeping in view the changes which would take place in future in the age structure of population, educational attainment and hence in the occupational structure and composition in the village.

As far as specific suggestions are concerned, usage of solar energy for various village activities, organization of digital technology training programmes, strengthening of extension programmes for women entrepreneurs, healthcare systems for elderly population, improvement in the quality of water and sanitation infrastructure are some of the important suggestions for improving the standard of living of the village population and for an inclusive process of transformation of the village.

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## DOCUMENTATION

The purpose of this section is to make available to the readers official documents such as reports of committees, commissions, working groups, task forces, etc., appointed by various ministries, departments, agencies of central and state governments and international organisations, which are not readily accessible either because they are old, or because of the usual problems of acquiring governmental publications, or because they were printed but not published, or because they were not printed and remained in mimeographed form. We also present in this section, official documents compiled from scattered electronic and/or other sources for ready reference of the readers. It will be difficult and probably not worthwhile to publish the documents entirely. We shall publish only such parts of them as we think will interest our readers. The readers are requested to send their suggestions regarding official documents or parts thereof for inclusion in this section.

We are also keen to publish Papers, Notes or Comments based on the material included in this section. We invite the readers to contribute the same to our journal, which we shall consider for publication in subsequent issues of the journal, after the usual refereeing process.

In the present section, we publish:

1. Prof. N. Rath's articles published in *Artha Vijnana*
2. Prof. N. Rath's articles published in *Indian Journal of Agricultural Economics*
3. Prof. N. Rath's articles published in *Economic and Political Weekly*
4. Prof. N. Rath's articles published in *Journal of Indian School of Political Economy*

# ON FIXATION OF PRICE IN AGRICULTURE ON THE BASIS OF COST OF PRODUCTION\*

NILAKANTHA RATH

Every time there is pressure on the agricultural produce markets, there has been demand from various quarters to fix the price of the agricultural produce through state intervention. Different bases for fixation of price have been suggested, an important and persistent one being the cost of production of the commodity.

The demand for choosing such a basis is quite old. During the past half century in many countries farmers' organizations and others have demanded the fixation of the price of produce on the basis of the cost of production. In India the demand was put forward and seriously considered for the first time some two decades ago, when the subcommittee on Agricultural Prices of the Policy Committee on Agriculture examined the question in 1947. The sub-Committee recorded that it could not recommend the cost of production approach' for fixation of fair prices until the necessary data had been collected on a scientific and proper basis. There was no agency at the time for collecting such data in the country, and no useful body of data was available for

use by the sub-committee in its task. The sub-committee, therefore, recommended the cost-price parity basis for fixation of prices.

The rather short-lived Commodities Prices Board drew attention to these observations of this sub-committee, in discussing the bases for fixation of *rabi* grain and pulse prices in India, in 1947.<sup>1</sup> But it also noted that in the U.K. "these calculations are made the basis of the bargaining which leads to price determination and are not used by themselves to determine prices directly."<sup>2</sup>

During the last few years there has been a renewal of the demand, from many quarters, for fixing agricultural produce prices on the basis of cost of production. From the point of view of availability of cost data, the situation is also different today. Since 1954, the Directorate of Economics and Statistics of the Ministry of Food and Agriculture has been sponsoring continuous Farm Management and Cost Studies in a number of districts

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1. Sovani, N. V. (ed.): Reports of the Commodity Prices Board, G.I.P.E. (Pub. No. 20), Poona, 1948.

2. Ibid., p. 13.

in the country. Though the originally stated objectives of these surveys were methodological, they present data in sufficient detail and are collected in a 'scientific and proper manner' to meet the requirements of the task of price fixation.

Indeed, one of the uses of these data to which the Directorate has drawn attention (in unpublished documents) is the fixation of prices on the basis of the so-called bulk-line cost theory. That this has been one of the objectives of these cost surveys is suggested not only by the presentation of detailed cost data in the form suitable for calculation of the bulk-line cost, but also by the estimation of such costs, in almost all the reports, for each of the major crops in the districts surveyed.

In view of the availability of relevant data, it would be worthwhile at this stage to examine the ways in which these cost data can lead to the fixation of the price of the produce.

It might be useful to start with a reference to the role of cost of production in the ultimate determination of the price of the commodity in the market. It is a wellknown proposition in economics that the price in the market is a resultant of the operation of both the forces of demand and supply, reflecting the underlying conditions of utility and cost of production. The arbitrariness of trying to fix the

price of any commodity with reference to its "cost of production" alone, and the unknown and uncertain consequences that may follow such a step, would be obvious to all students of economics.

While it may be easy to dismiss the whole question of price fixation with the help of cost data, in this manner, it is necessary to examine the question in some detail to see what the implications of such a procedure might be.

Naturally, the relevant cost of production is the cost per unit of produce, and not cost per acre, as is sometimes mistakenly thought. The cost per unit of produce is estimated in a variety of ways, and the choice of the bases and assumptions in estimating costs would result in different costs of production. The farm management studies referred to earlier, present alternative cost estimates based on alternate concepts of cost (costs A, B, C, etc.). These give different cost referred to earlier, present alternate cost estimates based on alternatives. The choice is sure to involve a large element of arbitrariness, which would present the price fixing authority with a situation where the cost data by themselves cannot be the guiding factors in fixing price.

The various cost bases referred to above, differ on the ground of inclusion or exclusion of particular items of cost in

the total cost of production. A variant of this problem of exclusion or otherwise, is the allocation of costs between main and by-products. In estimating the cost of production of, say, paddy, it is proposed to allocate the total cost between paddy and straw, a by-product. Some deduct the value of the by-product from the total cost and consider the residual as being the cost of production of the main product; others allocate the total cost between the main and by-products in the proportion of their gross values. Both these methods have been followed in the Indian studies, thereby rendering these costs non-comparable between regions. It should again be clear that the choice of the basis will result in significantly different prices, and consequently in varying degree of support to producers.

An equally important problem is the method of imputing the values to many items of input that are not directly purchased by the farmers. Even with the inclusion of the same set of items in the total cost, variations in methods of imputations will bring about different cost estimates. The estimation of bullock labour costs, either on the basis of prevailing hire charges or on the basis of maintenance cost of bullocks, is an illustration in point.

These difficulties of definition of costs, and methods of estimation would result in significant differences per unit of produce costs, thereby emphasising the large element of arbitrariness in using one or other of these for price fixation.

However, it may be assumed that somehow this choice is made, and uniform concepts and definitions are adopted. A greater difficulty raises its head. Despite frequent references to "the cost of production", it should be quite clear, at least after a look at data, that the per unit of produce cost of production varies from farmer to farmer and the range between the lowest cost and the highest cost is very large, and the distribution of farmers over this range is fairly wide. A look at the data presented in Table 1 taken from the Indian Farm Management Survey Reports, would amply illustrate the point.<sup>3</sup>

he question immediately arises : At what level of cost should the price be fixed? The most frequent answer to this question has been given in terms of the so-called bulk-line cost. In brief, it means fixing the price at that level of per unit of produce cost, at which around 85 per cent of the produce will be covered. This is an old concept which has been long abandoned in the countries like the U.S. where

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3. The table is meant to illustrate the point. All similar tables are not presented here.



it was advocated early.<sup>4</sup> In India, quarters would appear to justify a dis- however, the prevailing belief in some cussion of it.

**Table 1. Cost of Production of Irrigated Wheat in Punjab**

Cost of Production Rs./md.	1955-56			1956-57		
	Production: Cumulative percentage	Holdings: Cumulative percentage	Area: Cumulative percentage	Production: Cumulative percentage	Holdings: Cumulative percentage	Area: Cumulative percentage
5-7	5.08	4.08	8.76	-	-	-
7-9	18.96	13.60	17.25	10.47	6.85	8.74
9-11	40.01	29.93	30.72	19.71	13.70	20.59
11-13	60.02	48.30	50.01	40.51	30.83	37.26
13-15	76.98	65.99	68.55	62.99	52.06	56.50
15-17	87.69	78.92	79.45	80.66	69.87	71.34
17-19	91.69	85.04	86.80	88.15	80.14	84.24
19-21	95.77	90.48	92.87	91.11	84.25	86.64
21-23	97.62	94.56	95.57	94.50	89.73	93.08
23-25	98.51	95.92	96.16	95.20	91.10	94.75
25-above	100.00	100.00	100.00	100.00	100.00	100.00

Soure: Farm Management Reports for Punjab 1955-56, 1956-57

The first difficulty with the bulk-line cost is: why should 85 per cent of the produce be supported? How does one decide, with only the array of cost data, what proportion of the produce to support? Another arbitrary decision, whose implications are not quite clear.

There might be some point in considering bulk-line cost if one could find that over years a given level of costs (properly adjusted for changing input prices) would

cover the same proportion of the total produce, or that over various regions any comparative level of costs covered approximately the same proportion of produce. The detailed data would show that this is not the case.

For five States in India cost data were estimated for various crops in the years 1955-56 and 1956-57. In Table 2 we present crop-wise figures showing (1) the per unit of produce cost that would have

4. For a detailed discussion of the issues involved, see the excellent study of M. K. Bennett, *Farm Cost Studies in the United States*, Food Research Institute, Stanford, 1928.

covered 85% of the total produce in that year, (2) the prevailing market price for the commodity in the village (or nearby markets) during the year and the volume of produce covered by that level of cost; (3) the average cost of production of the commodity in the villages and the volume of produce supported at that level of costs.

Now if it is assumed that differences in the price of any commodity in a given year among regions are due mainly to relevant economic factors, then one might consider these prices as comparable. If these prices are equated to per unit of produce costs in different regions surveyed, then we find that the volume of produce covered would differ widely from region to region. For wheat, for example, this proportion varies from 86 per cent in the Punjab (unirrigated wheat) to 80 per cent in Bombay in 1956-57. (Ref. Table 2 for other examples also).

There is nothing surprising about these wide divergences revealed in the data. It, however, goes to show that if in the various regions the same proportion of the produce (say 85%) is to be supported, then the regional price pattern would

have to be very different from the one that prevailed at the time of the enquiry. In some areas the price may increase very considerably, by more than 50 per cent, while in others it may have to be brought down. The new regional price pattern would be something for which the only justification would be the support for an arbitrary level of produce in each region, and no economic criteria whatsoever!

If the bulk-line-cost theory of price support is made applicable to all competing crops in any region, then the relative price structure would change in most unpredictable ways.

Nor is it possible to show that for the same crop the relative cost position between years will remain steady. In the first place it should be quite clear that the relative cost position of the various farmers will not remain unchanged over years. A high cost farmer this year may not remain high cost next year, or the year after. Therefore, it is difficult to say that the relative cost pattern in two years will account for identical proportions of produce in the two years.

**Table 2. Bulk-Line Cost, Average Cost and Market Price of A Number of Crops and the Proportion of Produce Covered by Them**

State (1)	District (2)	Sample (3)	Variety (4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Wheat Irrigated													
I. Uttar Pradesh	Both	C.A.		18.0	14.1	72	11.7	54.1	16.7	14.5	74	12.6	59.3
Uttar Pradesh	Both	Survey		18.6	14.1	67	13.4	60.7	21.5	14.5	46	15.9	59.0
II. Punjab	Both	C.A.		16.50	12.8	60	12.1	51.0	18.2	15.1	40	14.4	53.1
II. Bombay	A'nagar	C.A.		-	-	-	-	-	27.7	18.4	57.9	17.9	63.8
Bombay	A'nagar	Survey		-	-	-	-	-	26.5	18.4	71.8	14.4	57.0
Bombay	Nasik	C.A.		-	-	-	-	-	31.0	18.4	38.0	23.0	58.9
Bombay	Nasik	Survey		-	-	-	-	-	23.7	18.4	53.6	18.3	53.5
Wheat Unirrigated													
I. Punjab	Both	C.A.		22.62	12.8	46.0	11.6	35.20	24.9	15.1	36	18.1	52.3
II. Bombay	A'nagar	C.A.			-	-	-	-	26.6	18.4	78.3	13.6	55.4
Bombay	A'nagar	Survey			-	-	-	-	21.4	18.4	79.7	13.5	56.8
Bombay	Nasik	C.A.			-	-	-	-	32.3	18.4	44.8	23.9	63.9
Bombay	Nasik	Survey			-	-	-	-	20.0	18.4	77.7	14.7	65.6
Cotton													
I. Punjab	Both	C.A.	Desi	39.31	26.5	60	24.5	56	35.3	28.1	68	26.5	60
Punjab	Both	C.A.	American	40.89	31.9	72	24.7	45	41.1	32.1	69	29.3	57
Cotton													
II. Madras	Both	C.A.	Irrigated	72.7	-	-	-	-	62.2	-	-	-	-
		C.A.	Unirrigated	17.9	-	-	-	-	15.2	-	-	-	-
		Survey	Irrigated	-	-	-	-	-	61.2	-	-	-	-
		Survey	Unirrigated	-	-	-	-	-	82.3	-	-	-	-

(Contd.)

**Table 2. Bulk-Line Cost, Average Cost and Market Price of A Number of Crops and the Proportion of Produce Covered by Them -(Contd.)**

State (1)	District (2)	Sample (3)	Variety (4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Sugarcane													
I. U.P.	Both	C.A.	Planted	1.20	1.44	97	0.89	65	1.20	1.44	92	0.89	70
		Survey	Planted	1.18	1.44	97	0.91	65	1.18	1.44	94	0.96	62
Paddy													
I. West Bengal	Hoogly	C.A.	Aman	13.4	10.3	62	10.2	61	14.1	12.8	75	12.4	70
	24 Para	C.A.	Aman	10.7	10.4	81	8.8	65	12.9	12.1	77	9.8	54
ganas													
II. Madras	Both	C.A.	I	16.9	-	-	-	-	17.6	-	-	-	-
			II	12.9	-	-	-	-	10.5	-	-	-	-
			III	16.8	-	-	-	-	17.3	-	-	-	-
Madras	Both	Survey	I	-	-	-	-	-	16.1	-	-	-	-
			II	-	-	-	-	-	13.2	-	-	-	-
			III	-	-	-	-	-	20.3	-	-	-	-
Jute													
West Bengal	Hoogly	C.A.		37.0	27.7	72	23.1	59	43.5	26.5	53	32	64
	24 Para	C.A.		18.0	27.5	100	14.3	82	35.0	27.9	75	27.9	75
ganas													

Columns 5 &amp; 10: Bulk-line cost Rs./md.

Columns 6 &amp; 11: Average annual price Rs./md.

Columns 7 &amp; 12: Percentage covered of production

Columns 8 &amp; 13: Average cost Rs./md.

Columns 9 &amp; 14: Percentage covered of production.

Source: The farm management reports for the respective states.

Even if the relative positions of individual farmers changed in the cost array, it may not matter, if one can be sure that the same proportion of the total produce will be accounted for by the same level of costs, adjusted for changes in input prices. To illustrate the point, the average per maund costs of production of wheat

in the two districts of Ahmednagar and Nasik were estimated by considering only the changes in input prices (base 1954-5). The indices of average per maund costs prepared in this manner are presented along with the index of actual average costs, in the following table:

1954-55 = 100				
	<i>Irrigated Wheat</i>		<i>Dry Wheat</i>	
	1955-56	1956-57	1955-56	1956-57
<i>Ahmednagar</i>				
Actual	106	123	112	103
Computed	94	124	109	108
<i>Nasik</i>				
Actual	122	125	75	118
Computed	127	157	70	105

This shows that if only an index of average cost is to be prepared, and the whole cost array of one year be adjusted for the next on this basis the relative cost positions and the proportions would be quite different from the pattern of distribution of actual costs and corresponding proportion of produce. Consequently, one cannot use the array of cost data for one year to estimate the bulk-line cost for a subsequent year, given the index of the average cost per unit of produce.

If one cannot say that having once found the array of the Cost of production and the corresponding proportions of total produce all that one has to know is

the average change in per unit of produce cost from year to year in order to fix the price covering a given proportion of produce, then it is difficult to see how this cost of production data can be of any use for price fixing. For, the alternative is to conduct a detailed cost study every year to fix prices, too tall an order to be of much practical use!

Finally, it is necessary to note that price fixing in agriculture is best undertaken when the farmer is about to make up his mind about growing the crop. In such case the actual costs simply do not exist to be taken into account.

## **FIXATION OF PRICE IN AGRICULTURE**

This brief review of the possible use of cost data show that there are numerous conceptual and practical difficulties in using cost of production data directly in fixing price of agricultural commodities. There are no clear choices regarding the cost concept to be used and the methods of imputation of costs. There is a whole array of costs of production and not a single cost, and there is no guidance in the cost array itself for the determination of the price level. Any arbitrary formula like the so-called bulk-line cost, will create more problems than it will solve, in that the relative price structure-regional as well as for alternate crops-would be changed in most arbitrary ways, and the consequences would be neither predictable nor necessarily based on any rational assessment of the requirements of the situation.

The Sub-committee on Agricultural Prices in 1947, and the Commodity Prices Board later, found not only statistical difficulties but also arbitrariness in the parity formula in fixing agricultural prices. But there was some belief, at least on the part of the former; that the cost of production data, if 'scientifically and properly' collected, will be of direct help

in fixing prices. The above review based on such data collected during the last decade would show that there is not much hope in that direction either.

### ***Summary***

In this paper an attempt is made to examine the question of the use of cost of production data for the fixation of prices of farm products. Besides pointing out that price is the resultant of the operation of both forces of supply and demand, the paper uses Indian Farm cost data to highlight the difficulties in their use for price fixation. Firstly, it is shown that different cost concepts will give different prices, and the choice among these will be largely arbitrary. Secondly, it is shown, that costs per unit of produce vary from farm to farm, and the choice of any particular cost-the so-called bulk-line-cost for example, would be not merely arbitrary, but also lead to very significant changes in the relative price structure of the same crop over regions, as well as among various crops. All these changes will have no economic justification whatsoever. Therefore it is concluded, cost of production data by themselves cannot provide any basis for fixation of price of farm products.

# **RELATIVE MOVEMENTS OF AGRICULTURAL WAGE-RATES AND CEREAL PRICES: SOME INDIAN EVIDENCE**

NILAKANTHA RATH AND R. V. JOSHI\*

THE OBJECT of this note is to examine with the help of available data the relative trend in agricultural wages and the prices of staple cereals over years, in certain parts of India.

It is generally believed that not only salaries, but also wages are stickier than commodity prices during periods of inflation and deflation, and, therefore, than the cost of living of the working-class. While the proposition has received attention in respect of urban and industrial wages, not much work has been done in regard to agricultural wages in India in this respect. The problem is of particular interest in agriculture where labour is not unionized. Normally, the longer contractual period of employment of most salarieds and urban workers would be considered one of the factors leading to the slower movement of salaries and wages. In agriculture, on the other hand, most employment is on a casual, daily basis. This might lead one to expect a faster adjustment of wage-rates to changes in the commodity price-level, in agriculture.

It would be more appropriate to compare the changes in the cost of living of wage-earners with the changes in their total earnings (income), rather than with the daily wage-rates, as total earnings are a product of daily wage-rates and the number of days for which employment is found. Again, this latter factor is also likely to fluctuate more in the case of agricultural labour, than in the case of urban, industrial labour with which it is, more often, either full employment or unemployment. For obvious reasons, however, attention will be devoted, in this paper, to daily wage-rates rather than average earnings of agricultural labourers.

A systematic examination of the question of relative movements of wages and cost of living of agricultural labour requires long-period time-series data on both, which are neither plentiful nor of good quality.

Periodic enquiries into agricultural wages in India began as early as the 1850's, and regular annual collection of such data started in 1880 in all parts of

British India.<sup>1</sup> These published data, the methods of their collection and their usefulness were examined by K. L. Dutta in his Report on Wages and Prices in India, in 1917. This examination of available data till 1910, revealed their severe shortcomings. Therefore, between the years 1911 and 1919, various moves were afoot at the governmental level for revision of both the period and the methods of collection of wage-data. The effort at the evolution of a uniform method failed in 1919, and each province followed its own method. In some, wage-data continued to be collected on an annual basis, with modified concepts and definitions, and in others, the enquiries were on a quinquennial basis. Unfortunately, the systematic publication of these data ceased in 1923, with the cessation of the publication *Prices and Wages in India*. Published data in one form or the other are available only for a few provinces, like C.P. and Berar, Bombay, and the Punjab.<sup>2</sup> The largely unpublished data in the quinquennial wage-enquiries of U.P. have been used by Shri S. C. Chaturvedi in his report on *Rural Wages in the United Provinces*, in 1947. We could manage to obtain the data only for Bombay Presidency for the years

1924 to 1940, from the annual Administration Reports of the Presidency, and propose to present them here. The wage-data were collected for skilled, unskilled, and field labour, the last category referring to casual agricultural labour. The data were collected from all talukas in the Presidency (apparently from taluka headquarters) and were later averaged for longer administrative regions. Only the annual averages for the three divisions of the Presidency as well as for the Presidency as a whole, are available in published form.

No cost-of-living data are available for rural areas for this period in Bombay Presidency (or any other province, for that matter). However, as expenditure on cereals forms the bulk of the cost of living of rural labour, it may be considered fair to compare the trend in prices of the main cereals of the region with the trend in wage-rates of field labour. The price index for *jowar* and *bajra*, the two major cereals in this Presidency, was computed by taking the simple average of the wholesale prices in the various markets in each Division for which data were published in the Statistical Atlas of the

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1. For a detailed historical account of the various schemes for collection of agricultural wage-data, see N. RATH, *Critical Review of Research in Agricultural Economics in India*, unpublished Ph.D. thesis submitted to the University of Poona, 1960, chapter on "Agricultural Labour".

2. There may be more, but we have not come across any others so far. The data for Bombay as well as for C.P. and Berar were annual while the Punjab statistics were quinquennial.



Bombay Presidency. It would have been better to use rural retail prices of *jowar* and *bajra* if they were available.

The indexes of the wages of field labour as well as of the prices of *jowar* and *bajra* for the years 1924-40 (1924=100), for the three divisions, Central, North and South, and the entire Presidency are plotted in the graphs 1 to 4.<sup>3</sup>

The period is interesting in that it covers the years before the Great Depression of the 30's, the years of Depression, and the slow recovery till 1940 when the war-period started. The graphs show that while, in each of the three divisions as well as in the whole Presidency, the prices of *jowar* and *bajra* sharply declined during the period from around 1928 to 1931, the decline in wages of field labour was not as sharp. The latter no doubt came down very considerably, but the decline continued long after the decline in prices ceased and the slow recovery started. It shows that not only

did wages not fall as sharply as prices, but also the adjustment of the wage level to a very low level of prices was rather slow. The price-level began rising above the wage-level since 1938, but the series ends soon after and, therefore, it is not possible to observe how wages behaved when prices of cereals began moving up.

The series for the Southern Division shows the wage-level consistently higher than the price-level compared to the relative position in 1924. This may possibly be due to the choice of the base year. If either prices or wages were high or low in that particular year. The absence of relevant data, however, precludes the examination of this question.<sup>4</sup>

This continuous lag of agricultural wages behind prices has also been noted by Chaturvedi on the basis of the quinquennial wage-data over the years from 1911 to 1944.<sup>5</sup> In the later years, the wage-rise from 1939 to 1944 was less than the rise in prices, in U.P.<sup>6</sup>

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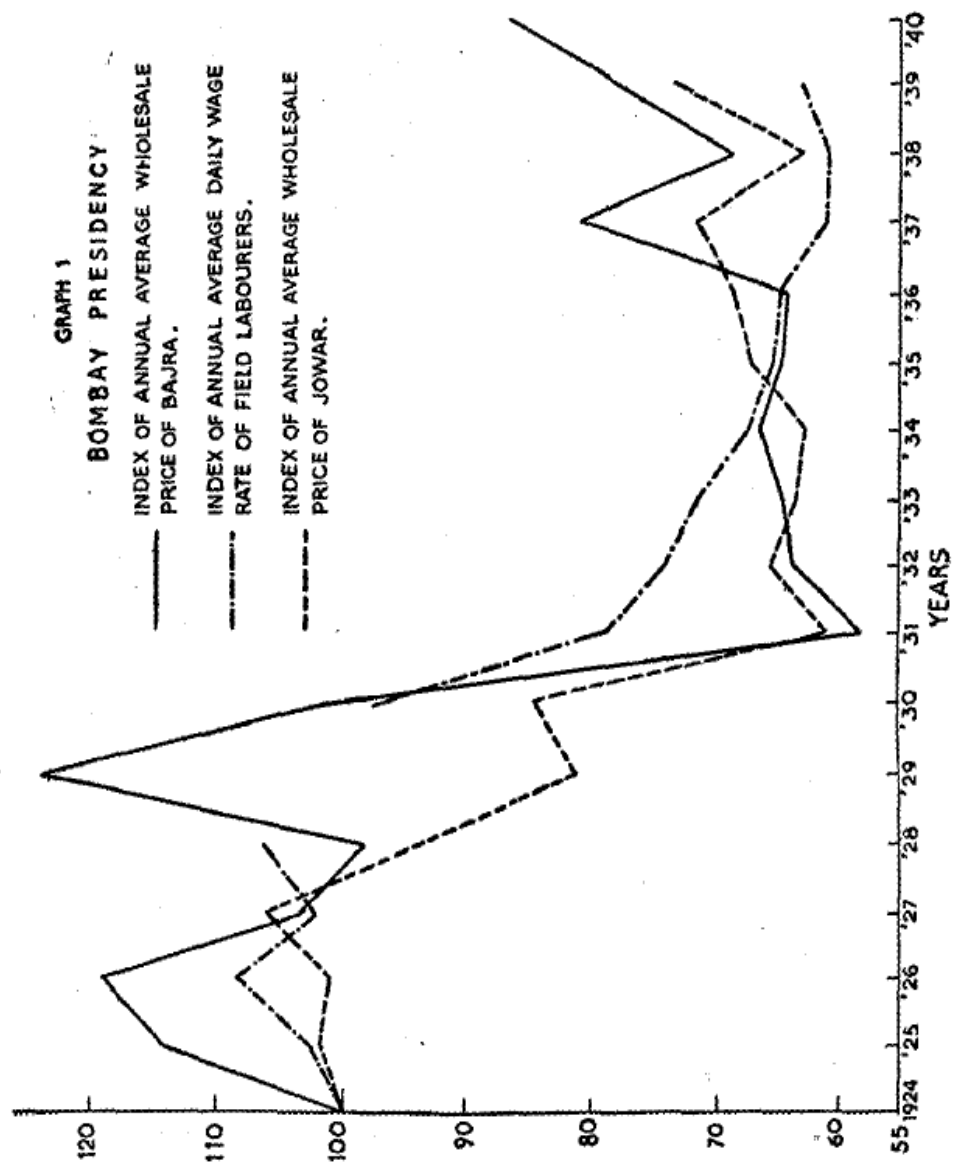
3. There is a gap in the wage series in 1929, because the Annual Administration Report for the year was not readily available.

4. Comparison of link-relatives (not given here) also confirms the findings presented above on the basis of index numbers with a fixed base. The point can also be examined with the help of regression analysis.

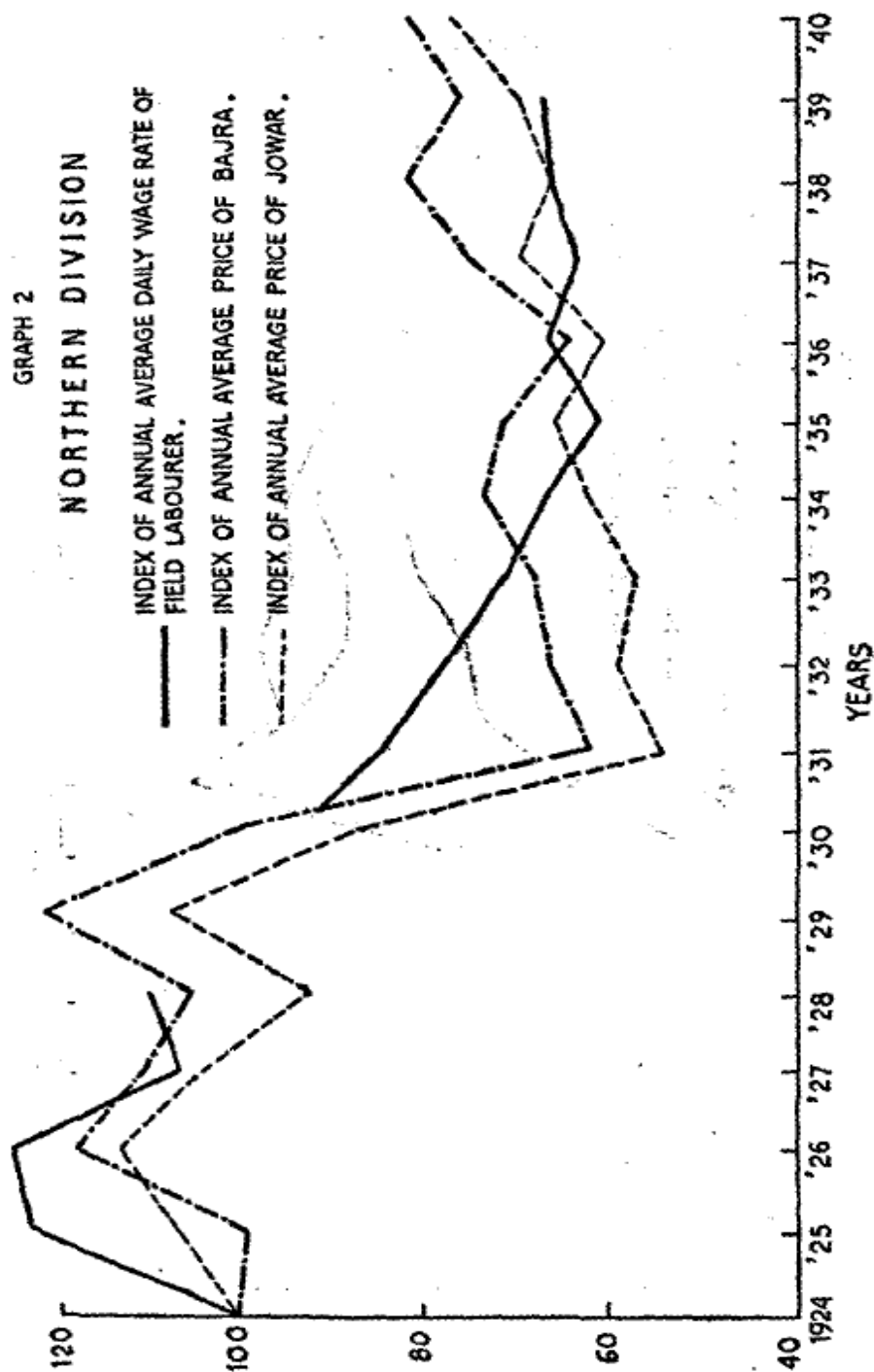
5. CHATURVEDI, *op. cit.*, pp. 90-100.

6. The Farm Accounts published by the Punjab Board of Economic Enquiry during the inter-war years were examined with a view to obtaining similar information for the Punjab on an annual basis. This, however, turned out to be impracticable due to the inadequate details in the published accounts.

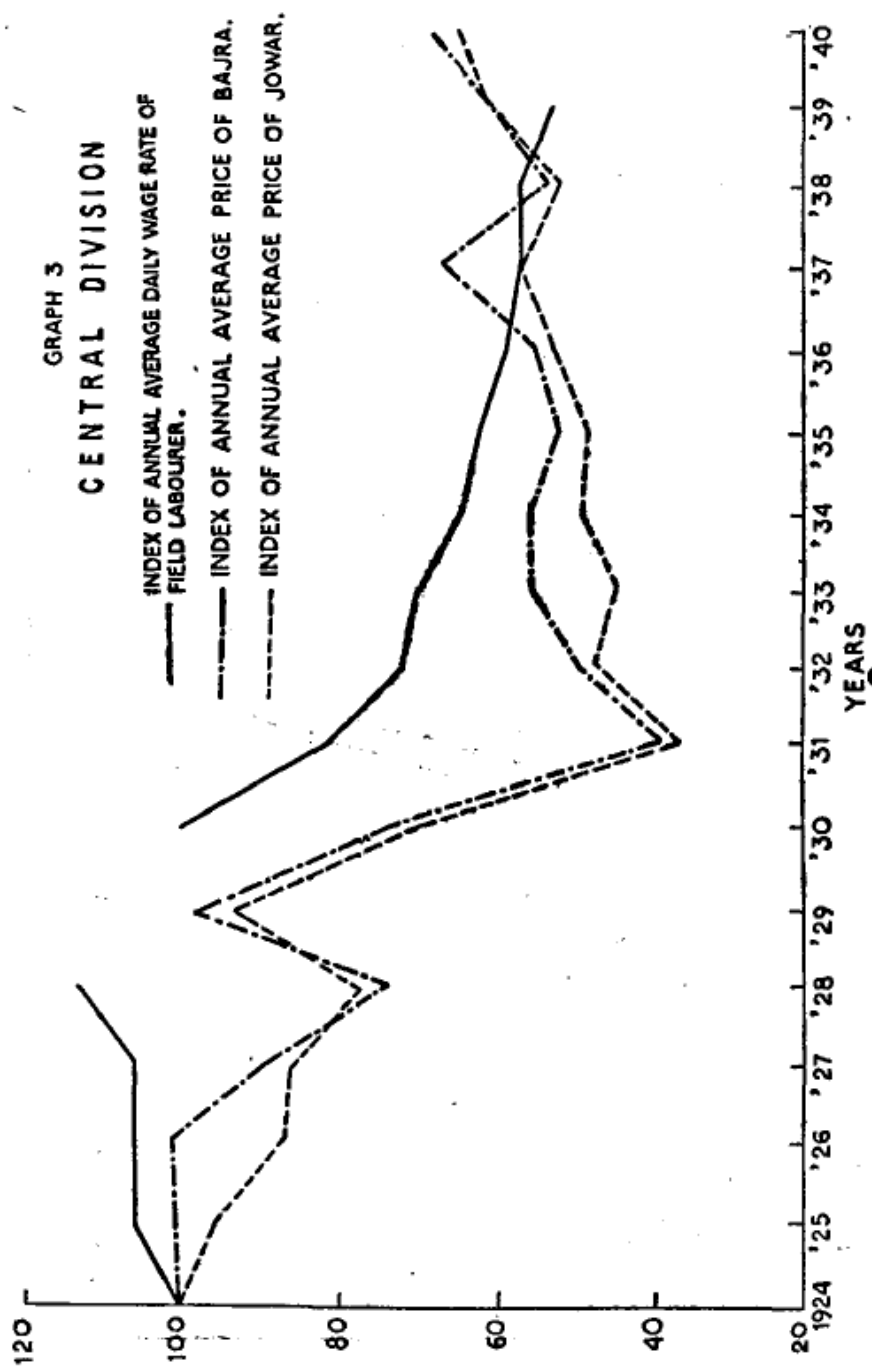
GRAPH 1. BOMBAY PRESIDENCY'



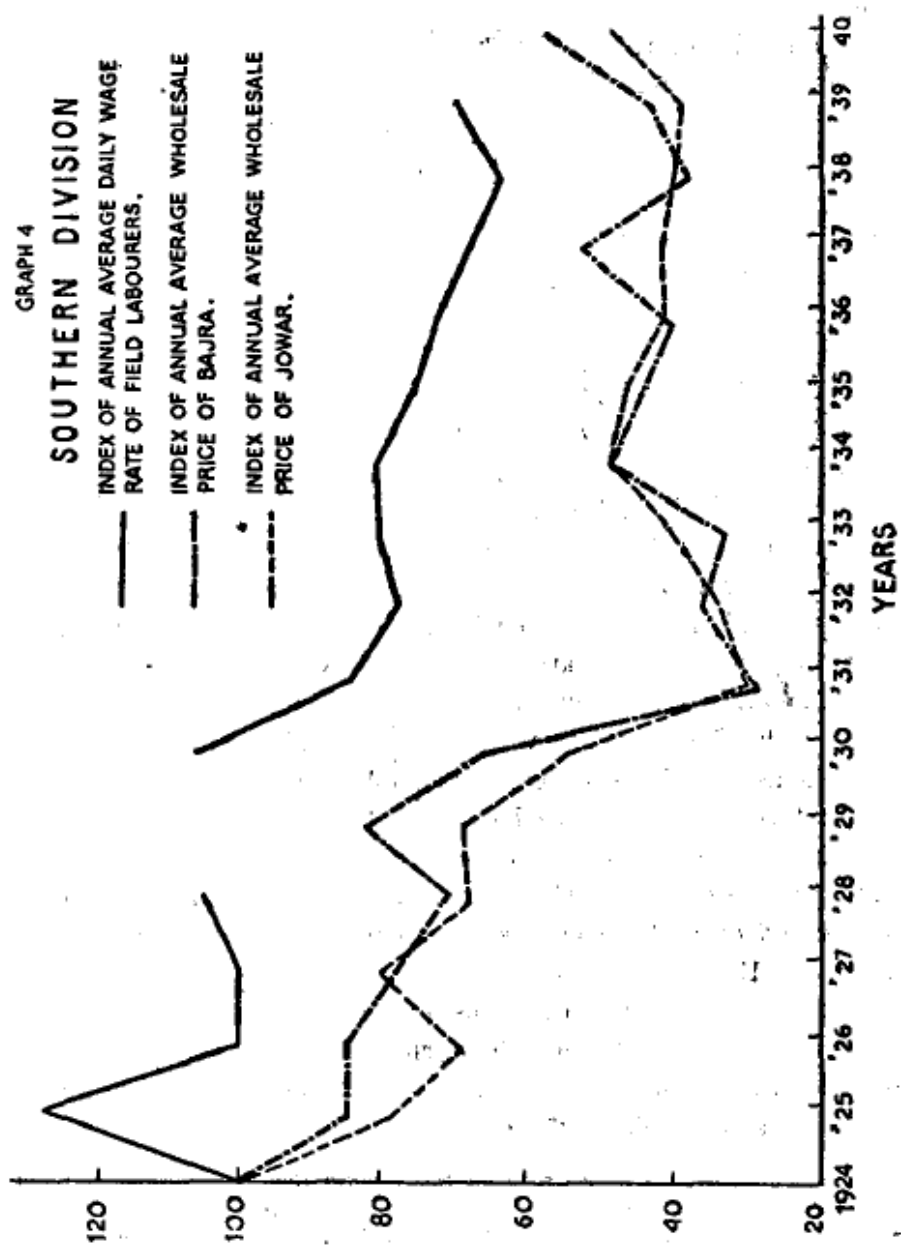
GRAPH 2. NORTHERN DIVISION



GRAPH 3. CENTRAL DIVISION



GRAPH 4. SOUTHERN DIVISION



A large body of wage-data has become available in published form since 1950 for a number of rural centres in each state, in the annual publication on agricultural wages by the Directorate of Economics and Statistics of the Ministry of Food and Agriculture. However, not much systematic effort to use these data appears to have been made so far.<sup>7</sup> It is therefore difficult to assess the usefulness of these data for the present purpose. A preliminary review of these data for a number of centres for the period 1950-62, however, makes one feel sceptical about the reliability of the data in many instances, mainly because of the unchanging wage-rates not only over months but over a number of years at a stretch for many centres. Dr. K. Mukerji also notes this and finds it very difficult to discuss any pattern in the set of data made available by the Directorate.

Pending a fuller assessment of these data, it might be useful to examine the wage- and price-data for three consecutive years, 1954-57, available in the Farm Management Survey Reports for a number of states. The data on wage-rates, as well as on prices of farm produce, were collected in course of these surveys, on a fortnightly basis, for all the villages in which farm samples were chosen. The

monthly average wage-rates for all these villages in a state, as well as the monthly average wholesale prices, have been published for five states: the Punjab, U.P, West Bengal, Bombay and Madras. These data are as reliable as one can reasonably expect, and relate to rather compact regions. The period covered, however, is short, only three years; but these are three interesting years from our point of view in that prices of most agricultural commodities began a sharp decline by the end of 1954, reached a trough in 1955, started rising by the middle of 1956, and over-topped the earlier levels by the end of the year 1956-57. This is therefore as good a period as any for studying the short-period movements in agricultural prices and wages. The monthly wage- and price-data for each of these states are given in the tables at the end.

A few characteristics of these wage-data stand out clearly. In the first place, in no state did the agricultural wages remain unchanged over the 12 months of each year. In most states there were variations in wage-rates over the year, but it is true that in some the variation was more than in others. In Madras and Bombay the range of variation in wage-rate was of the order of 10 per cent or less

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7. An exception is the effort of Dr. K. Mukerji to study the regional and functional wage-pattern for Western Maharashtra on the basis of these data, in an unpublished paper, entitled "Agricultural Wage Rates in Western Maharashtra".

(or about 10 paise a rupee), whereas in West Bengal it was somewhat more (between 20 to 40 paise in 1.3 rupees). In the Punjab the wage at the rabi-harvest time was considerably higher, but during the rest of the year the variations, though observed, were minor, like those in Bombay or Madras. In U.P. (the data for which are not reproduced in this paper), the wages for different agricultural operations (undertaken at different times of the year) were not the same in most of the villages for which data were collected.<sup>8</sup> Though these data are not adequate to make a systematic study of seasonality in wage-rates in various regions, it would appear that variations in wage-rates over a year are less in those areas where the cropping-pattern shows a fair spread over the *kharif* and *rabi* seasons, than in those where agriculture is confined to a single season and one or two crops only. This is illustrated by West Bengal where changes between months are larger, (or even in the case of the Punjab, where wages at the time of harvesting of *rabi* crops are much higher) than in the other states. The seasonality in wage-rates

would be, by and large, the result of relative demand and supply of casual labour at different times of the year.

The second interesting feature is that except in the case of U.P., the level of wages did not remain unchanged over the three years in these states, but the extent of variation over the three years was not very great, particularly when compared with the changes in prices of the cereals produced and consumed in the region. The index of the annual average wage-rate of field labourers and the index of the important cereals grown and consumed in the region, are presented. in the table on next page.

The data show that in Bombay, Madras and West Bengal the average wage-rates did change somewhat in the course of the three years, but the increase in cereal prices in 1956-57 was, in each case, much more than the increase in wage-rates. In Bombay, for example, the doubling of the staple-cereal prices did not appear to have been accompanied by any more than five to six per cent rise in wage-rates.

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8. This is one reason why one might legitimately wonder about the absolutely unchanging monthly average wage-rates over years in many villages in the official wage-statistics referred to earlier.

(1954=100)					
Year	Wage	Jowar		Bajra	
Bombay-Ahmednagar					
1955-56	98	110		119	
1956-57	106	207		186	
Bombay-Nasik					
1955-56	96	100		108	
1956-57	104	154		156	
Madras					
		Paddy		Cholam	
1955-56	102	100		96	
1956-57	108	118		125	
Punjab					
		Wheat (Amritsar)		Wheat (Ferozepur)	
1955-56	104	97		96	
1956-57	114	114		113	
West Bengal-Hooghly					
		Paddy			
1955-56	103	107			
1956-57	110	131			
West Bengal-24 Pargans					
		Paddy			
1955-56	93	103			
1956-57	103	123			
U.P.					
		Wheat	Gram	Maize	Paddy
1955-56	100	113	121	120	114
1956-57	100	130	159	162	126

The exceptions were two, U.P. and the Punjab. In the case of U.P., where the reports give only wage-rates for different agricultural operations in each village during the year, the tables (not reproduced here) showed on comparison, absolutely no change in these rates over the three years. The prices of all cereals, on the other hand, rose considerably, from 26 per cent in the case of paddy, to



62 per cent in the case of maize (see table above).

Punjab was the only state where the rise in wage-rates kept up with the rise in prices. This is noticeable not only in the annual averages, but also in the trend of the monthly wage-rates and prices. This would be so, if, among other things, wages were mainly in kind (cereals) and the kind-wage rates remained unchanged throughout.<sup>9</sup> In the absence of further information in this regard, it is difficult to see why the Punjab should be an exception either in respect of the method of payment of wage or in the matter of movements of wages and prices.

Similar data from the farm-management-survey reports for the West Godavari district of Andhra for the three years 1957-60, show again the same characteristics. (The detailed data for Andhra are given in Table 5). The wage-rates vary significantly over the year - in both paddy- and tobacco-producing zones. This is in contrast to the situation in Madras, Bombay, and also, to a lesser extent, U.P. The dominance of one crop during the year would perhaps, at least partly, account for this characteristic. Secondly, while wage-rates did

not remain unchanged over the corresponding months of the three years, the annual average did not change significantly in the paddy zone. In the tobacco zone, however, it rose by more than 20 per cent. Paddy prices, on the other hand, changed not merely from month to month, but the average level rose by about 10 per cent in the third year compared to the first.

One can conclude from these data that sharp increase in the price of staple cereals is not necessarily accompanied by compensating, or even sizeable, increase in wage-rates, in the short period of a year or so. Wages appear to take time to adjust, and that too, only if the changed price-level tends to persist over a longer period.

Both the pre-war and the post-war data presented in this paper tend to show that wages are sticky in the short run and lag behind prices in the long run.<sup>10</sup>

The implication of this for the standard of living of the rural labour-class is clear. Of course, fluctuations in the number of days of employment should also be taken into account in this context. But it is unlikely that in the short run, possibilities

9. One of the reports mention that even kind-wages are adjusted downward, if price of that commodity rises very much. Some farm accounts for the Punjab for the inter-war years also suggest changes in kind-wage rates, depending on the condition of the harvest and prices.

10. Growing rural-unemployment may affect wage-rates over time. While this may affect the relative level of wages, it would be more difficult to use this factor for explaining the long lags and what would appear to be turning points in the series. In any case, the non-availability of relevant data prevents us from examining this aspect here.

of employment change very much. In the long run, shorter period of employment may cancel the advantages of a relatively higher wage-rate in depressions. But in the period of rising prices, particularly in our rural set-up, rising period of employment cannot be expected to compensate the relatively lower wage-rate. In discussing the repercussions of short-period price-rise, or even sustained price-rise in agriculture, therefore, this characteristic of rural wages and the implication for the cost of living of rural labour have to be kept in View.

**Table 1. Agricultural Wage-Rates and Wholesale Price of Wheat (in the Villages) in the Punjab, 1954-57**

Wages: (in paise per day)													
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	Average
1954-55	235	238	236	234	232	228	228	221	230	325	320	220	246
1955-56	225	232	226	239	244	240	225	258	290	337	325	234	256
1956-57	240	278	263	260	275	250	263	275	263	371	368	237	279

Price of wheat (Rs. per maund)				
	April-July	August-October	November-March	Average
Amritsar District				
1954-55	10.85	13.81	14.32	13.04
1955-56	10.56	11.87	15.01	12.70
1956-57	13.66	14.54	16.00	14.86
Ferozpur District				
1954-55	11.30	14.02	13.76	12.84
1955-56	10.67	11.66	13.55	12.34
1956-57	13.66	13.83	15.50	14.47

Source: Farm Management Survey Reports for Punjab, 1954-55, 1955-56, 1956-57; Directorate of Economics and Statistics, Ministry of Food and Agriculture, New Delhi.

A second possible implication to which attention may be drawn relates to the productive effort of the producer-farmer. The relatively higher wage-rates in periods of declining agricultural prices are likely to affect the relative cost-structure and, therefore, the production of such crops, in the case of which labour cost is a relatively larger part of the total cost of production. This, for example, is a possible reason for the sharp decline in the area under cotton in the old C.P. and Berar, and the increase in current fallow

following the depression in 1929-31.<sup>11</sup> If less than in the case of cotton. The reverse area under cereals was not affected as is likely under conditions of rising prices, much, it was partly because cereals were though any evidence for this has yet to be subsistence crops, and partly because the labour component in their cost was much provided.

**Table 2. Agricultural Wage-Rates and Wholesale Price of Cereals (in the Villages) in Bombay, 1954-57**  
(Wages in paise per day) (Prices in Rs. per md.)

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	Average
<i>Wages-Ahmednagar dist.</i>													
1954-55	-	-	-	-	-	-	98	96	94	94	94	92	95
1955-56	90	95	94	90	92	91	91	91	94	101	97	94	93
1956-57	99	96	103	96	94	96	98	101	110	111	108	105	101
<i>Price of jowar</i>													
1954-55	-	-	-	-	-	-	10.11	10.19	8.23	7.33	5.78	5.30	7.84
1955-56	5.37	6.73	7.80	7.51	7.40	7.07	8.26	9.18	9.95	10.62	11.71	11.76	8.61
1956-57	12.81	14.15	14.63	17.18	17.90	17.64	18.31	18.26	16.85	15.47	15.47	15.84	16.21
<i>Price of bajra</i>													
1954-55	-	-	-	-	-	-	10.28	10.28	8.34	8.28	7.86	7.44	8.74
1955-56	7.77	9.60	10.19	9.92	9.82	6.13	10.00	10.58	11.14	11.33	12.20	12.78	10.37
1956-57	13.06	14.19	15.08	17.00	17.57	16.77	17.33	17.47	16.60	16.81	16.70	16.91	16.29
<i>Wages - Nasik dist.</i>													
1954-55	-	-	-	-	-	-	93	93	93	91	93	89	92
1955-56	89	92	94	92	90	90	88	86	85	85	85	84	88
1956-57	85	86	90	90	91	101	99	99	95	99	112	108	96
<i>Price of jowar</i>													
1954-55	-	-	-	-	-	-	10.00	9.75	9.00	-	-	-	-
1955-56	-	-	8.00	8.19	8.25	8.25	8.56	8.34	8.21	7.92	9.69	10.74	8.64
1956-57	11.08	12.50	12.50	13.04	13.33	13.17	14.37	14.37	13.63	13.50	14.00	13.96	13.29
<i>Price of bajra</i>													
1954-55	-	-	-	-	-	-	12.25	11.38	11.09	9.78	9.59	9.09	10.53
1955-56	9.58	9.97	11.08	12.17	11.69	10.73	11.02	11.85	11.71	11.46	12.05	12.99	11.36
1956-57	12.85	14.69	15.04	15.69	16.55	17.50	18.11	17.38	17.13	17.59	17.29	17.72	16.46

Source: Farm Management Survey Reports for Bombay. 1954-57.

<sup>11</sup> Ref. unpublished paper by N. Rath, on Price response of acreage under Cotton and *Jowar* in C. P. and Berar, 1919-1940.

**Table 3. Agricultural Wage-Rates and Wholesale Prices of Paddy in the Villages in West Bengal, 1954-57**  
 (Wages in Rs. per day)  
 (Prices in Rs. per md.)

	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Average
<i>Hooghly dist.- Wages</i>													
1954-55	-	-	-	-	1.61	1.65	1.63	1.53	1.49	1.63	1.57	1.53	1.55*
1955-56	1.44	1.40	1.40	1.73	1.6	1.8	1.8	1.6	1.5	1.8	1.6	1.5	1.6
1956-57	1.6	1.6	1.6	1.6	1.7	1.8	1.7	1.6	1.6	1.7	1.8	1.7	1.7
<i>Price of Paddy</i>													
1954-55	-	-	-	-	8.9	9.8	10.0	10.1	9.9	9.1	9.6	9.5	9.6*
1955-56	9.3	9.5	9.6	9.5	10.6	11.1	11.0	11.2	11.3	10.1	9.9	10.1	10.3
1956-57	11.2	12.7	13.3	13.2	13.3	13.0	13.0	13.4	13.2	11.4	11.5	12.1	12.6
<i>24 Parganas dist.-Wages</i>													
1954-55	-	-	-	-	1.53	1.64	1.60	1.39	1.36	1.50	1.48	1.36	1.44*
1955-56	1.21	1.20	1.42	1.65	1.5	1.1	1.2	1.4	1.2	1.2	1.2	1.4	1.3
1956-57	1.3	1.3	1.5	1.5	1.8	1.8	1.4	1.4	1.4	1.6	1.6	1.3	1.5
<i>Price of Paddy</i>													
1954-55	-	-	-	-	9.7	10.2	10.1	9.6	9.7	9.6	9.6	9.5	9.6*
1955-56	9.3	9.4	9.4	9.5	10.4	11.0	10.8	10.3	11.1	9.0	9.0	9.6	9.9
1956-57	10.2	11.5	11.8	12.5	12.7	12.5	12.4	12.7	12.4	10.9	10.9	11.5	11.8

\* These are averages for July 1954 to June 1955.

Source: Farm Management Survey Reports for West Bengal, 1954-57.

**Table 4. Agricultural Wage-Rates and Wholesale Prices of Cereals (in the Villages) in Madras, 1954-57***(Wages in paise per day)**(Prices in Rs per nod)*

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	Average
<i>Wages</i>													
1954-55	100	101	95	97	97	95	97	95	93	94	98	98	97
1955-56	97	97	99	96	94	93	93	95	99	100	99	100	97
1956-57	100	103	95	103	104	107	111	110	107	108	105	106	105
<i>Price of paddy</i>													
1954-55	12.2	11.9	11.9	12.2	12.2	12.3	11.2	10.7	11.3	11.3	10.5	10.2	11.7
1955-56	10.7	11.1	11.0	11.4	11.8	10.9	11.0	11.1	11.9	12.3	12.2	12.9	11.5
1956-57	12.9	13.8	14.1	14.8	14.7	14.7	13.7	13.4	12.8	13.0	13.5	13.7	13.8
<i>Price of cholan</i>													
1954-55	11.2	10.3	10.3	10.6	10.6	10.2	10.4	9.5	9.4	9.5	9.2	8.3	10.0
1955-56	8.6	8.5	8.7	8.8	9.0	9.0	9.3	9.3	10.1	10.6	11.4	11.7	9.6
1956-57	11.6	12.6	13.6	14.2	14.3	13.7	13.1	13.1	13.8	14.0	13.7	13.9	13.5

Source: Farm Management Survey Reports for Madras, 1954-57

**Table 5. Agricultural Wage-Rates and Wholesale Price of Paddy (in the Villages) in West Godawari District of Andhra, 1957-60***(Wages in paise per day)**(Prices in Rs per nod)*

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	Average
<i>Wages-Paddy zone</i>													
1957-58	1.71	1.37	1.11	1.00	1.13	1.68	1.74	1.44	1.45	1.10	1.11	1.26	1.34
1958-59	1.30	1.45	1.03	0.99	1.02	1.69	1.50	1.19	1.46	1.18	1.21	1.34	1.28
1959-60	1.66	1.30	1.10	1.00	1.02	1.74	1.31	1.40	1.29	1.18	1.23	1.28	1.29
<i>Wages-Tobacco zone</i>													
1957-58	0.92	1.13	0.96	1.00	1.13	0.96	1.04	1.06	1.08	1.04	1.00	1.00	1.03
1958-59	1.19	1.08	1.00	1.04	0.96	1.25	1.12	1.25	1.25	1.21	1.17	1.25	1.15
1959-60	1.25	1.04	1.12	1.02	1.31	1.42	1.17	1.48	1.50	1.25	1.25	1.13	1.24
<i>Price of Paddy-Both zones</i>													
1957-58	13.43	13.46	13.00	12.45	12.46	11.59	11.70	11.04	11.37	11.15	11.40	11.68	11.90
1958-59	11.81	12.39	12.18	12.39	12.71	12.01	10.85	10.78	11.25	11.54	12.36	12.28	11.93
1959-60	13.38	13.84	13.72	13.92	14.02	12.26	12.13	12.23	12.74	12.79	12.75	12.69	13.08

Source: Unpublished Farm Management Survey Report for Andhra, 1957-60

### **Summary**

The object of this short paper is to examine, with the help of available data, the relative trend in agricultural wage-rates and the prices of the major cereals entering into the consumption of workers, over years, in India. Two different sets of data have been examined: one, the official data relating to the wage-rates of field labourers and the prices of *jowar* and *bajra* in the different divisions of the Bombay Presidency during the inter-war years, and two, the

data on wage-rates and cereal prices collected during the farm management surveys in six states of India during the years 1954-55 and 1956-57. The examination of the data (with all their limitations) shows that money-wage rates change less from year to year (indeed, are very sticky in the short run) than the prices of cereals, and over longer periods movements in wages appear to lag behind movements in these prices. Some implications of this phenomenon are mentioned briefly at the end.

# ECONOMICS OF IRRIGATION IN WATER-SCARE REGIONS: STUDY OF MAHARASHTRA

N. Rath A.K. Mitra

## CHAPTER I The Problem

1.1 Irrigation is crucial to the development of agriculture in India. It is necessary in order to ensure stability in crop production and fuller exploitation of cultivable land in all seasons. It is also necessary in order to derive and sustain benefits from biological improvements in crops and technological improvements in cropping.

1.2 However, available estimates of potential total water resource for India as a whole show that it is in short supply compared to the requirements for irrigation.<sup>[1]</sup> In 1980-81, 49.585 m/ha of crop land, constituting only about 28 per cent of the total crop land (28.61 per cent of the gross cropped area, and 21.66 per cent of the net cropped area) in India was irrigated. The ultimate irrigation potential from all sources, surface and underground, is estimated, in the Seventh Five Year Plan document, to be 113.5 m/ha of gross cropped area. Assuming the 1980-81 intensity of irrigation, this implies that nearly 60.6 per cent of the gross cropped area, or about 63.3 per cent of the net cropped area in the country, can ever be irrigated. (Ref. Table 1.1)

1.3 While the all-India figure highlights the overall inadequacy of water for irrigation, the regional picture shows wide differences in this regard. The state-wise data, in Table 1.1, show that in the states of Assam, West Bengal, Bihar, U.P., Haryana and Punjab, covering the Brahmaputra valley and the Indo-Gangetic plains, all the net sown area (or almost all of it) can ultimately be provided with irrigation. On the other hand, in the states of Rajasthan, Gujarat, Maharashtra and Karnataka the ultimate potential net irrigated area is expected to be between 25 and 40 per cent of total net sown area and between 30 and 40 per cent of gross cropped area, presuming the existing intensity of cropping on irrigated land. This percentage is only marginally higher for Madhya Pradesh, around 50 per cent. The states of Tamil Nadu, Andhra Pradesh and Orissa show a still higher percentage, between 60 and 70 per cent. But if the coastal plains of these three states, including the large river deltas, are separated, because of near 100 per cent ultimate irrigation potentiality there (the data are not separately available), then the remaining areas of these states lying in the upland plateau region, would also show percentages similar to those of Karnataka, Maharashtra and Gujarat. The entire plateau region (including the arid regions of Rajasthan) is characterised by

rather low and uncertain rainfall and poorer and more uncertain underground sources of water. In fact, between 40 and 45 per cent of the ultimate irrigation potential in these regions is expected to be from minor irrigation sources, mainly from underground, which are known to be more uncertain, and often with poor discharge capacity. The long term perspective of agricultural development in these regions, therefore, acquires a different and more serious dimension. It is obvious that the use of water in these regions has to be most economical if agriculture is to develop and sustain the vast multitudes dependent on it.

1.4 The position and potentiality of irrigation in the State of Maharashtra well illustrates the problem. In Table 1.2 are given data about the present (i.e., 1982) position of irrigation and the ultimate potential from all state-sector sources of flow irrigation (major, medium and minor), districtwise.<sup>[2]</sup> The percentage figures in the last column show that except the eastern most districts of Bhandara and Chandrapur (including Gadchiroli) and Nagpur, the coastal districts, and the district of Kolhapur, only about 40 per cent or less of the net sown area in the other districts can ever be irrigated. The percentage is 30 or less in six of the nine districts of western Maharashtra in four of the five districts of Marathwada, and in the three western-most districts of the Vidarbha region.

1.5 The ultimate irrigation potential in Table 1.1 and 1.2 is calculated on the basis of existing pattern of use of water for different crops, and the existing intensities of irrigation. Therefore, expressed in terms of net or gross cropped area, the figures cannot say anything clearly about the comparable availability of water for irrigation in the different districts. To make such a comparable statement, the Irrigation Department of the State Government has expressed the ultimate irrigation potential in every district in terms of "*Rabi Jowar* equivalent". It means the number of hectares of *Rabi Jowar* that can be ultimately irrigated with the quantity of water that is likely to be available in the district from the various flow irrigation sources in the State sector. These data are presented in Table 1.3, Col. 4, and they are expressed as percentage of net sown area of the district in Col. 6. The data show that if irrigation is provided to only a crop of *Rabi Jowar*, then the water ultimately available will suffice to irrigate 64 per cent of the net sown area of the State, this underlines the gross inadequacy of water for irrigation in the State as a whole, there are eleven districts-five in Western Maharashtra, three in Marathwada, and three in Western Vidarbha - for which this percentage is lower than the State average: in many of these cases it is as low as 30 per cent or less. Since *Rabi Jowar* requires less irrigation water than other crops, these percentage figures highlight



**Table 1.1. Present (1980-81) And Ultimate Potential (Major And Minor Sources)  
Irrigated Area (Gross And Net) As Percentages Of Gross And Net Sown Area**

State	1980-81		Ultimate Potential	
	Net Irrig. Area as % of Net Sown area	Gross Irrig. Area % of as Gross cropped area	Net Irrig. Area as % of Net Sown area	Gross Irrig. Area % of as Gross cropped area
(1)	(2)	(3)	(4)	(5)
Andhra Pradesh	32.24	35.36	68.31	69.35
Assam	21.54	16.60	100.00*	77.48
Bihar	35.51	32.58	100.00*	100.00*
Gujarat	20.92	21.82	42.56	43.03
Haryana	59.24	60.58	81.45	77.08
Himachal Pradesh	16.08	16.49	34.62	32.88
Jammu & Kashmir	42.52	40.25	86.43	74.91
Karnataka	13.75	15.72	37.88	41.09
Kerala	10.92	13.31	60.18	59.88
Madhya Pradesh	12.47	11.46	51.85	46.82
Maharashtra	10.53	12.41	30.55	34.12
Orissa	19.82	19.56	68.35	59.24
Punjab	80.70	85.48	91.43	92.49
Rajasthan	19.54	21.61	26.84	29.20
Tamil Nadu	47.95	50.92	56.77	59.07
Uttar Pradesh	54.89	46.27	100.00*	95.22
West Bengal	26.76	20.22	100.00*	78.60
India	27.66	28.61	63.23	60.62

\* indicates that the percentage is more than 100.

Source: Data Relating to 1980-81 are taken from Indian Agriculture in Brief, 20th edition. (New Delhi: Ministry of Agriculture and Rural Development) Table 2.6, and the Ultimate Potential data are taken from Seventh Five Year Plan, 1985-90, Vol.II,

(Footnote: See Annexures 3-2 and 3-6.

#### **Footnote to Table 1.1**

Method of calculation of Ultimate potential percentages: The method of calculation for every State is along the lines illustrated for all India in the following:

present (1980-81) and Ultimate Potential Irrigated area (gross and net) as proportion of the estimated total crop area (gross and net) in India.

---

1. Gross Cropped Area	(1980-81) 173.324 (M/ha)
2. Net cropped Area	(1980-81) 140.270 (M/ha)
3. Gross Irrigated Area	(1980-81) 49.585 (M/ha)
4. Net Irrigated Area	38.805 (M/ha)
5. (3) as per cent of (1)	28.61 %
6. (4) as per cent of (1)	27.66 %
7. (4) as per cent of (3)	78.26 %
8. Ultimate Potential Irrigated Area (gross)	113.5 (M/ha)
9. (8) minus (3)	63.915 (M/ha)
10. Net irrigated area out of the additional gross irrigated area (9) x (7)	50.020 (M/ha)
11. Ultimate potential net irrigated area: (4) plus (10)	80.825 (M/ha)
12. Ultimate potential gross cropped area (1) plus [ (9) minus (10) ]	187.219 (M/ha)
13. Potential gross Irrigated area as per cent of total gross cropped area	60.6 %
14. Potential net Irrigated area as per cent of total net cropped area	63.23 %

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Note: In estimating potential net and gross cropped area as well as net irrigated area, the existing, i.e., 1980-81 relations of these have been used to estimate the future potential. If a greater intensity of cropping on irrigated land is visualized for the future, the percentage in rows 13 and 14 would be smaller than what is estimated in the table.

**Table 1.2. Present (1982) and Additional Potential Irrigated Cropped Area in Maharashtra from State Sector Surface Irrigation Sources**

(Area: in '000 ha.)

District	Irrigation Potential Created (Upto June 1982)	Additional Potential Irrigated Crop Area	Total (2+3)	Total Irrigated Area as % of Net Sown Area (1978-79)
(1)	(2)	(3)	(4)	(5)
1. Greater Bombay	-	-	-	-
2. Thane	8.39	129.83	138.22	52.14
3. Raigarh	23.32	138.21	161.53	82.50
4. Ratnagiri	4.70	139.97	144.67	40.60
<b>KONKAN</b>	<b>36.41</b>	<b>408.01</b>	<b>442.42</b>	<b>54.38</b>
5. Nashik	113.36	68.23	181.59	20.41
6. Dhule	64.55	51.47	116.02	16.46
7. Jalgaon	106.31	232.97	339.28	41.86
8. Ahmednagar	206.56	126.08	332.64	27.38
9. Pune	133.86	77.10	210.96	21.07
10. Satara	97.63	127.77	225.40	38.47
11. Sangli	75.41	115.48	190.89	30.98
12. Solapur	142.61	156.03	298.64	26.26
13. Kolhapur	59.53	192.83	252.36	59.56
<b>WESTERN MAHARASHTRA</b>	<b>999.82</b>	<b>1147.96</b>	<b>2147.78</b>	<b>29.09</b>
14. Aurangabad	101.69	143.23	244.92	20.17
15. Parbhani	135.01	150.52	285.53	28.35
16. Beed	73.23	139.75	212.98	26.31
17. Nanded	87.56	205.87	293.43	40.31
18. Osmanabad	69.96	88.51	158.47	14.21
<b>MARATHWADA</b>	<b>464.45</b>	<b>727.88</b>	<b>1192.33</b>	<b>24.46</b>
19. Buldhana	32.77	65.95	98.72	14.48
20. Akola	43.41	40.25	83.66	10.19
21. Amravati	14.25	119.76	144.01	19.92
22. Yavatmal	40.88	291.22	332.10	38.86
23. Wardha	27.62	155.54	183.16	41.44
24. Nagpur	68.11	261.52	329.63	58.29
25. Bhandara	132.56	325.90	458.46	118.06
26. Chandrapur	79.39	462.13	451.52	78.39
<b>VIDARBHA</b>	<b>438.94</b>	<b>1722.27</b>	<b>21611.21</b>	<b>41.83</b>
<b>MAHARASHTRA</b>	<b>1939.62</b>	<b>4006.112</b>	<b>5945.74</b>	<b>32.59</b>

Source: Col. 2 from Table 7.4; Col. 3 calculated on the basis of in Tables 7.4 (Col.2), 7.5 (Col.2) and 7.7 (Cols. 3 & 4); Col.5 is Col.4 expressed as a percentage of data in Col.5 of Table 7.3 of the Report of the *Fact finding committee on Regional Imbalance in Maharashtra*, April, 1984 (Bombay: Department of Planning, Government of Maharashtra)

**Table 1.3. Present (1982) and Additional Potential Irrigated Area in Terms of Rabi (Jowar) Equivalent**

District	Irrigation Potential under construction and future (Rabi Equivalent)	Upto June 1982	Total	Net Sown Area (1978-79)	(Area: in '000 ha) (4) as % of (5)
(1)	(2)	(3)	(4)	(5)	(6)
1. Greater Bombay	-	-	-	6.60	-
2. Thane	261.52	16.90	278.42	265.10	105.40
3. Raigarh	283.60	47.85	331.45	195.80	169.28
4. Ratnagiri	252.24	8.47	260.71	356.30	73.17
<b>KONKAN</b>	<b>797.36</b>	<b>73.22</b>	<b>870.58</b>	<b>817.20</b>	<b>106.53</b>
5. Nashik	113.11	187.93	301.04	889.60	33.84
6. Dhule	94.21	118.15	212.36	705.00	30.12
7. Jalgaon	481.55	219.74	701.29	810.50	86.53
8. Ahmednagar	256.65	420.48	677.13	1214.90	55.74
9. Pune	165.49	287.34	452.83	1001.00	45.24
10. Satara	277.05	211.74	488.79	585.90	83.43
11. Sangli	299.76	195.75	495.51	616.10	80.43
12. Solapur	345.92	316.17	662.09	1137.40	58.21
13. Kolhapur	798.28	246.44	1044.72	423.70	246.57
<b>WESTERN MAHARASHTRA</b>	<b>2837.79</b>	<b>2203.74</b>	<b>5041.53</b>	<b>3784.10</b>	<b>68.28</b>
14. Aurangabad	258.89	183.81	442.70	1214.00	36.47
15. Parbhani	376.35	337.57	713.92	1007.30	70.87
16. Beed	237.07	124.23	361.30	809.50	44.63
17. Nanded	424.43	180.52	604.957	727.90	83.11
18. Osmanabad	144.32	109.18	253.50	1115.00	22.74
<b>MARATHWADA</b>	<b>1441.06</b>	<b>935.31</b>	<b>2376.37</b>	<b>4873.70</b>	<b>48.75</b>
19. Buldhana	130.68	64.93	195.61	681.90	28.69
20. Akola	80.94	87.30	168.24	820.70	20.50
21. Amravati	202.38	24.08	226.46	722.90	31.33
22. Yavatmal	601.82	84.48	686.30	854.60	80.31
23. Wardha	307.20	54.55	361.75	442.00	81.84
24. Nagpur	402.21	104.75	509.96	565.50	90.18
25. Bhandara	420.36	170.98	591.34	388.30	152.29
26. Chandrapur	547.34	93.97	641.311	690.80	92.84
<b>VIDARBHA</b>	<b>2713.90</b>	<b>684.74</b>	<b>3398.64</b>	<b>5166.70</b>	<b>65.78</b>
<b>MAHARASHTRA</b>	<b>7790.11</b>	<b>3897.01</b>	<b>11687.70</b>	<b>182411.70</b>	<b>64.07</b>

Source Tables 7.5 and 7.6 (Table 7.4 for Col.5) of the Report of the Fact Finding Committee on Regional Imbalance in Maharashtra.

the great relative scarcity of irrigation water in the State in general and in the drought-prone agricultural regions of Western Maharashtra and Marathwada, and the three western-most districts of Vidarbha, in particular.

1.6 From the point of view of the social economy, irrigation water is the factor in shortest supply, shorter than land, in the agriculture of most parts of the State. I particularly those located in the relatively low rainfall regions that are also drought prone. Under such factor supply situation, elementary economic logic as well as common sense suggest that maximisation of returns from agriculture would imply maximisation of return per unit of the factor in relatively short supply. In this case it should mean maximisation of net return per hectaremeter of irrigation water, and not per hectare of irrigated land. The Irrigation Commission (1972) has also acknowledged this logic in regard to the relatively water-short regions. It says:

"In areas other than those with ample water resources, .... our policy should aim at securing the maximum crop production per unit of water."<sup>[3]</sup>

1.7 This logic, of course, holds for individual farms as well as for the society as a whole. If an individual farmer is faced with a total quantum of water which

is relatively short of what the total irrigable land at his disposal would require, then he must try to maximise returns per unit of water. If sometime one finds farmers behaving in a manner that can be interpreted to suggest as if they are trying to maximise return per hectare of irrigated land, it is most likely that they are individually faced with availability of more water than irrigable land, (possibly because of state policy in regard to supply of canal water), despite the overall regional shortage of water for irrigation.<sup>[4]</sup>

1.8 The pattern of canal irrigation that has developed in these relatively dry regions of Western Maharashtra over the last century has been quite different from that in many other parts of the country. In the first place, the culturable command area (C.C.A.) under a medium or major flow irrigation project is much larger than the area that is planned to be provided with irrigation water in any year, called the irrigable command area (I.C.A.) The I.C.A. is smaller for two main reasons: (i) The inadequacy of the quantity of water available in the reservoir, at 75 per cent dependability, and (ii) the pattern of cropping under irrigation envisaged. Most of the flow irrigation projects were conceived essentially as protective irrigation projects, in view of low and uncertain rainfall in the region. It was, however, found early that the feasible

cropping pattern under irrigation would not be able to generate enough income and water revenue to make these projects financially viable. The cropping pattern depended on the prevailing crops and culturable practices and the firm possibilities about it including normally expected yields in years of normal rainfall, the prices of various crops, the changes in land layout and slope necessary for the purpose, the possibility of raising necessary capital resources and the worthwhileness of all these. Originally, these systems were designed to irrigate the seasonal crops, like jowar, bajra, cotton, etc., generally grown under rainfed conditions, in order to protect them from impact of adverse rainfall. The earliest canal system of the region was the Nira Canal System. The experience in this and the later canal systems in the region was that farmers made poor use of irrigation water except in years of drought. The reason, as M. Viswesvaraya pointed out at that time, was that while these seasonal crops yielded more under irrigated condition, their costs of production under irrigation were also proportionately higher, leaving no more farm business income than under unirrigated condition in a year of normal rainfall<sup>[5]</sup> Because of this disincentive, feature the sugarcane "block" system, with assurance of water to a block of land for six years at a time, was introduced to persuade the farmers to use irrigation

water, since this was the only important crop that could not be grown without irrigation and was profitable. Entrepreneurs were encouraged to start sugar factories so that the farmers feel encouraged to cultivate sugarcane. This stress on sugarcane in the irrigable command areas of irrigation projects resulted in further shrinking of the originally planned I.C.A.

1.9 There is reason to believe that the underlying agronomic and economic conditions have undergone change in recent years, particularly the last two decades. New crops, new varieties of seeds of the traditional crops, new agronomic practices as well as different market conditions have emerged. This holds out greater possibility of more economic use of water in farming. If the current sugarcane-centred pattern of use of canal water needs to be changed on such grounds, the question of sugarcane cultivation may be examined with the help of well-irrigation in the command areas, where wells can recycle the inevitably seeping canal water. Indeed, the Maharashtra Irrigation Commission, reporting in 1962, that is, even before the new seeds and crops had been introduced, had stressed this as a policy change, in the interest of wider use of canal water in the essentially drought prone regions of the State.<sup>[6]</sup>

1.10 Examination of this whole problem requires enquiry into a set of related questions. It is first of all necessary to ascertain the quantity of canal water required and actually used to irrigate individual crops in each of the three seasons. Given this information, it would be possible to examine the types of crops and cropping pattern that would give the best return to society per unit of irrigation water. This requires examination of the levels of physical inputs and outputs of everyone of the crops under irrigation, and their valuation at comparable prices. It also requires examination of crop rotations and combinations at the farm level, from the agronomic and economic angles. The exercise has to be based on data not relating to a single year but to a number of years, in order to take account of variations in weather, yields, and prices. Estimates will have to be made taking into account different degrees of risk associated with these elements of farm business.

1.11 If wider coverage of irrigation water, than currently in vogue, is indicated by these exercises, then the additional costs of construction of these channels as well the greater losses of water through seepage have to be taken into account in estimating the final social benefits and costs. These are basically engineering problems.

1.12 This examination will be essentially in terms of the current rates of use of water by farmers for different crops and the current manner of supply of canal water by the irrigation authority. It is, however, possible to think of different rates of use of irrigation water by different crops in the region, aided by a different design and schedule of water distribution. This may lead to greater economy in the use of water and, therefore, further expansion of the irrigable area.

1.13 The purpose of the present study is to examine mainly the first set of questions relating to the most economic utilization of irrigation water in the region. The related question of additional capital cost and cost due to seepage of water involved in drawing the distribution channels longer to cover wider areas, is essentially an engineering problem. We propose, to use some study by other agencies to illustrate the problem. The last set of questions arising out of different methods of distribution of water can at present be mainly of a speculative character in the absence of solid ground level experience. We shall refer, to these problems at the end, only in a general way.

1.14 It is proposed to examine the pattern of use of irrigation water and the economic alternatives, in the context of

two well-established canal systems in this drought prone region, essentially to illustrate the problem. They are: the Pravara Left Bank Canal (PLBC, for short), and the Nira Left Bank Canal (NLBC).

1.15 The river Pravara in the Godavari basin is dammed at Bhandardara in Akola Taluka of Ahmednagar district. The construction of the dam began in 1911 and the dam as well as the entire canal system for distribution of water were completed by 1926, though by 1924, except for minor items, the essential storage capacity and distribution system were fully operative. The canals do not take off directly at Bhandardara. Instead, the stored water is let into the river and picked up at Ozar, 45 miles down stream, with the help of a pick up weir. The two main canals, Pravara Left Bank Canal (PLBC) and Pravara Right Bank Canal (PRBC) take off from here to irrigate the command area. The main canals are 80.12 miles long (PLBC = 47.12 miles); the branches distributories and minors are 183 miles long (PLBC = 140.37 miles and PRBC = 43 miles). The gross command area of the system is 228,720 acres (PLBC = 154,957 acres and PRBC = 73,763 acres). Eighty per cent of this, i.e., 182,976 acres (PLBC = 124,561 acres and PRBC = 58,415 acres) is culturable command area, that is cultivable land that can be irrigated with the distributory

system if water can be made available. Originally, the Dam was conceived to store 13,000 million cubic feet of water, and given the expected cropping pattern under irrigation, some 75,000 acres were expected to be irrigated annually (I.C.A.). However the actual storage capacity created by 1926 was a little over 10 TMC, giving an I.C.A. of 57,000 acres, 40,040 under PLBC and 16,960 under PRBC. The balance was to be provided later by fixing gates at the spillways to raise the storage level by 10 feet. The Annual Report of the Irrigation Department began by 1932-33, mentioning the I.C.A. to be 52,000 acres, without any change in the reservoir capacity. By 1940-41, the height was increased by 5 ft., but the expected area irrigable (ICA) remained unchanged.

1.16 The actual irrigated land, however, rarely reached the expected level. We shall mention here only the position with regard to the Pravara Left Bank Canal, though the situation under the Right Bank Canal has shown similar trends. Till 1938, that is for almost a decade after the completion of the canal system, the area under various crops under PLBC (counting the area under crops standing in the field for the whole year or for two seasons, Rabi and Kharif, only once) never exceeded 22,000 acres, and fluctuated below this level, while the ICA was more than 40,000 acres. From



1939-40 this area increased: but till today this area has fluctuated between 24 and 30 thousand acres. Besides the regularly irrigated areas, a certain amount of land is provided with "inadequate" irrigation (2 to 3 irrigations) mainly to lands growing sugarcane under well in summer, to supplement their irrigation source. This was negligible before 1936; since then it has acquired considerable

importance. Often it has been of the order of 10 to 14 thousand acres: it is essentially determined by the extent and distribution of rainfall during the year and the level of water in the irrigation wells in summer.

1.17 During the year 1978-79, the area irrigated with permission of canal authority under the PLBC was 26,734.52 acres. The division was as follows:

			(Area in acres)
Sugarcane Block	4,077	Kharif	3,852.52
Fruit Block	353.44	Rabi	9,952.20
Garden Block	245.5	(b) Total (K+R)	13,804.72
Three Seasonal Block	378.0	(c) Sugarcane area under well	4,050.65
Two Seasonal Block	3,825.21	getting 2/3 canal irrigations	
(a) Total under Blocks	8,879.15	(a) + (b) + (c)	
		Grand Total	26,734.52

1.18 Sugarcane Block area means that only one-fourth of the Block area is under sugarcane during the year (it used to be one-third until Borne years ago), apart from some overlap of the previous years' can awaiting harvesting. The remainder of the sugarcane block is put under irrigated seasonal crops, as per the rotational plans of the cultivators. Besides these, a little over 4,000 acres of sugarcane, grown under wells in the command area, were given 2 or 3 supplementary irrigations from the canal during the year. In fact, during the 3 seasons, i.e., Kharif, Rabi and Hot-weather (also referred to as Early Kharif), the gross irrigated cropped area was just a little less than 25,000

acres. In addition there were 1,000 acres under sugarcane as an overlap of the earlier year, and about 4,000 acres of sugarcane under wells supplemented with water from the canal system in the Hot Weather. If we add these to the gross irrigated cropped area, it comes to about 29,000 acres. Thus, we find that the actual irrigated area under the PLBC varied between half to two-thirds of the expected I.C. area, and about 20 per cent of the culturable command area. Sugarcane was the dominant single crop, accounting for nearly 25 per cent of the gross cropped area (including the area 'inadequately' irrigated). If the area of crops irrigated in both the Kharif and

Rabi seasons are added, (i.e., perennials calculated twice), then more than 28 per cent of the gross irrigated area in the two seasons together was under sugarcane. And this may be compared with the proportion of area under sugarcane proposed under the estimated total I.C.A. of 72,000 acres under the entire Pravara canals, that is, 10,000 acres or only 13.88 per cent. We propose to examine the net returns to the farm economy per acre inch of irrigation water under this pattern of use and compare it with alternative use patterns.

1.19 The Ililira Left Bank Canal (NLBC) is the oldest canal system constructed by the British in the Bombay Deccan. It was started in 1876 and went into operation in 1885, with an estimated irrigation capacity of 113,000 acres. With the completion of a new storage work in 1929, the capacity of the Left Bank Canal was expanded and a new Mira Right Canal was put into operation. The Mira Left Bank Canal consists of two zones - the perennial and non-perennial, the non-perennial zone, which is at the lower end of NLBC, comprises a part of the irrigation section (administrative) named 'Anthurne', the entire section called 'Nimgaon' and a part of the section named 'Bavda'. The main canal in this zone is 8 miles long. It has a gross command area of 41,909 acres, and C.C.A. of 39,085 acres. However, the

I.C.A. is only 10,000 acres forming approximately 25 per cent of the C.C.A. A little more than half, i.e., 53 per cent of this was under two-seasonal blocks, and the rest under seasonal crops. Sugarcane or any other perennial crop is grown in this area entirely under wells. We propose to examine the pattern of use of canal water for different crops in this zone, and particularly the pattern of well water use for sugarcane.

1.20 The system of water distribution in these and other canal systems is specific to the region. The Appendix A to this Chapter gives a brief account of the methods and terms involved, as well as the water rates in force in 1978-79, the year of survey. The second chapter estimates the demand for irrigation water at the distributory head by different crops in the PLBC and NLBC (non-perennial), and then tries to calculate the extent of loss of water in transit in different parts of the distribution system. Chapter three examines the economics of use of canal water for different irrigated crops and crop patterns. Certain uncertainties associated with the yields, prices and quantity and frequency of water supply, associated with the calculations in Chapter three, are examined in Chapter four. The fifth chapter examines the prospects for sugarcane in the State in the light of the policy implications based on the findings of. Chapters three and four

including the possibility of sugarcane under well. The sixth chapter makes a reference to the increased capital costs of the alternative pattern of water use suggested, and makes a very brief assessment of the benefit-cost ratio. The final chapter puts down the conclusions arising out of this study.

### NOTES

1. The matter is more serious, if requirements of water for domestic use and for industrial purposes, sure to grow at rapid rate, are added to the requirements for irrigation.
2. While comparing the two sets of figures for Maharashtra in Tables 1.1 and 1.2, the following should be kept in mind. The figure in Table 1.1 refers to the ultimate irrigation potential from all sources, while that in Table 1.2 refers to all flow irrigation sources in the state sector, including a significant part of the minor irrigation potential. Secondly, while the percentages in Table 1.1 refers to net irrigated to net sown areas, the percentages in Table 1.2 refer to gross irrigated to net sown area.
3. *Report of the irrigation Commission, 1972, Volume I*. New Delhi: Ministry of irrigation and Power, p. 112.
4. The point is also made in Committee to Study the Introduction of Eight Monthly Supply of water on the Irrigation Projects in Maharashtra: Interim Report, Bombay: Government of Maharashtra, Feb. 1979, paras 30-32.
5. Ref. Minutes of Evidence: Bombay Presidency; (of the Indian Irrigation Commission, Calcutta: Office of Superintendent, Government printing, 1902; Donald W. Attwood on the History of Deccan Canals in his paper "Irrigation and Imperialism: the causes and consequences of a shift from subsistence to cash cropping", *Journal of Development studies*, 1986.
6. Maharashtra State Irrigation Commission Report, Bombay, Government of Maharashtra, 1962. Section 5.5.

### APPENDIX - A

#### Present Systems of Distribution of Water

A.1 The system of irrigation as is now seen in Western Maharashtra is largely the outcome of physical factors such as topography, soil climatic complex, the nature of water resources, etc. Unlike in other parts of the country the soils in Maharashtra vary greatly from field to field and also water is not plentiful to be supplied to the farmers unrestricted.

A.2 The farmer has to decide in advance which crops he would like to irrigate and get the areas of each crop sanctioned by the Irrigation department. As stated in the Maharashtra State Irrigation Commission Report the sanctions are governed by the current irrigation policies such as maximising utilisation in Kharif season, encouraging the growing of foodgrain crops in Rabi season and minimising utilisation in summer season and most important of all the need to restrict the area under perennial crops to prevent large scale damage through waterlogging.

A.3 Under the present system of irrigation, sanction is given on seasonal basis in addition to the permanent commitments under the block system. Water is also supplied for casual irrigation on application in form No. 7. After getting the areas under individual crops sanctioned, the farmer has to obtain permission at each rotation for irrigating the sanctioned crops. This is done through a system of 'passes' issued to farmers for growing crops as sanctioned. Before each rotation the irrigation official enters the date, on which water would be supplied, on the passes, after which the farmers become entitled to get canal water for a particular crop and on the date specified. Sanctions for a variety of crops are given on long term basis, i.e., for six years or some times more.

This is the 'block system'. The important types of blocks at present in force on the Deccan canals are (i) cane blocks, (ii) fruit blocks, (iii) garden blocks, (iv) garden and seasonal block, (v) two seasonal blocks and (vi) three seasonal blocks.<sup>[1]</sup>

A.4 (i) Cane Block Cane Blocks are sanctioned in multiples of 1 acre and the basic cane area is restricted to one-third or one-fourth of the total block area depending upon demand of irrigators. This is referred to as 'one in three' or 'one in four cane block'. That means (in case of one-in-four) if a farmer has a 4 acre cane block, he can plant only 1 acre of cane in that 4 acre block, and in the remainder of the block area seasonal crop is allowed to be grown during the Kharif and the rabi seasons, except crops like long staple cotton, lucerne or groundnut in the hot weather. The farmers rotate the cane plot within the block As sugarcane necessarily requires 'overlap', (because 'Adsali' or 18 month sugarcane must stay in the field for more than a year and 'Suru' or annual sugarcane may have to stand in the field, awaiting harvesting for factory, beyond the stipulated period) additional cane area to the extent of 50 per cent of the basic cane area is allowed to be under sugarcane, but only during the months from July to March or with special sanction even in April but never in May or June. However, permission for 'overlap' has to be obtained separately every time. The normal period for this type of block is six years. The whole idea behind restricting the cane area to one-third or one-fourth area of the cane block is to keep control on the area of standing crop of cane in hot weather season. In the cane block if sugarcane is not planted, permission is given by the irrigation department to plant any seasonal crop whose water requirements are lighter than of sugarcane.

A.5 (ii) Fruit Block In this block fruit trees which stand in the field for a long time, such as, mosambi, orange, mango, etc., are allowed in the entire block area. Usually the contract sanctioned for such block is for 12 years.

A.6 (iii) Garden Block: In this block short term fruit trees like papaya, and other light perennials like vegetables and lucerne grass are allowed on 1/3 area. Of the remaining, 1/3 can be under long staple cotton and another 1/3 on any seasonal crops other than those mentioned above. The block is sanctioned for six years. The earlier garden and Seasonal Blocks have been gradually converted into Garden Blocks after 1965.

A.7 (iv) Two seasonal Block: In this block, only Kharif and Rabi seasonals are allowed to be grown with 100 per cent of the area of the block can be under irrigation in each of the two seasons. Special sanction is needed for any summer crop in the block. This block is also sanctioned for six years.

A.8 (v) Three Seasonal Block: Under this block only one-third of the block area can be put under long staple cotton or groundnut or onion in summer, which may carry over into the next Kharif season. Further, one-third of the area can be put under Kharif seasonal and another one-third under rabi seasonal. Thus one-third of the area of the three-seasonal block remains fallow in Kharif and two-thirds or less of the same remain fallow in rabi.

A.9 It is to be noted that no preliminary programme of irrigation is made for the Kharif season. Though the day-cusec of water released and area irrigated for each rotation in kharif season are recorded, these are not scrutinised for examining the efficiency of irrigation. On the 1st of October every year a 'preliminary irrigation programme' is prepared on the basis of the actual available water stored behind the dam, the anticipated overall river gains or losses between the dams and the weirs and the trend of water application in the past. Applications are then invited and these are sanctioned by the 15th of October. A Schedule called the 'Shejpali' giving the

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1. For a brief account of these prevailing methods and terms used in canal water distribution in the State, see P.R. Gandhi, *History and Practice or Management of Irrigation Waters in Maharashtra*, Aurangabad: Water and Land Management Institute, June 1981.

turns of different irrigators in each rotation is then prepared before irrigation starts from 1st November. The irrigation begins from the tail end and proceeds towards the head as the irrigation progresses. The concerned irrigators are informed about their turns one or two days in advance. This schedule of irrigation can be modified depending upon late demand, sowing periods of different crops and unauthorised use. In practice, however, actual modifications are seldom carried out and actual irrigation often does not proceed in the originally planned manner, this results in low reliability of water supply. Obviously in this system there is a tendency to overdraw water by individual farmers, as time and quantity are not the essence of the sanction, only when an irrigator says he had enough water does the next man get his turn, this makes some others suffer, particularly the tail enders.

A.10 The 'preliminary irrigation programme' contains mainly the following information and data: (i) live storage available, (ii) deduction of tank evaporation losses in rabi and hot weather seasons on the experience of about the lastest 10 years, (iii) this gives net available quantity of water at canal head, (iv) transit losses in the canal on the basis of the average loss of the last 10 years or so, (v) this gives the quantity of water available at distributary head, and finally (vi) the seasonal duty to estimate the requirement of quantity of water at distributary head. The area of different crops is converted into standard acre of area on sugarcane basis.<sup>[2]</sup> While preparing the programme the following points are observed. (i) quota for perennial areas for rabi and hot weather is kept aside, (ii) maximum rabi irrigation of wheat, jowar and gram is allowed, and then remaining water is proposed for hot weather seasonals and pre-seasonals of kharif crops.

A.11 As mentioned earlier, the application of the programme begins from 15th of October. The season is generally divided into 7 rotations in Rabi season and 9 rotations in hot weather season. The rotation is of 18 to 20 days in Rabi and about 14 to 15 days in hot weather season, the duration of the rabi season is of around 120 days. The quota of water in each rotation is fixed. If the total quota of water of a particular distributary for Rabi season is 'X' Mcft, the quantity to be drawn in each rotation will be 'X' Mcft divided by 7. However this can not be achieved in each rotation (watering) in practice. Therefore, any extra quantity utilised in the first two rotations is required to be adjusted in the last 3 or 4 rotations by drawing less.

A.12 Once the quota of each distributary originating from the main canal is determined, the flow of water in day-cusec in each distributary is decided as per the water demand statement. Each distributary has got a measuring device called 'Standing wave Flume' where discharge is measured each morning and evening. Also the data of day-cusecs utilised and the progressive total draw off in the rotation along with the approximate area irrigated and the progressive cumulative total of areas irrigated are recorded.

A.13 A number of 'water courses' take off from the 'distributary' or the 'minor' at different points in its course. A concrete structure with a vertical shutter device is installed at the point of take off of a water course to let out water into it from the distributary. There is, however, no water measuring device at this point. The cultivators take water into their fields by making a temporary breach in the bund of the water course separating their fields from the water course. They can also take water to a field when it is away from the water course by designing a field channels through the other farmer's field and breaching the bund of the water course at the head of the field channel.

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<sup>2</sup> the conversion rates are as follows: (Ref. Gandhi, op.cit.)

Rabi: while the actual sugarcane acre, including the overlap is treated as 1 acre, acre under garden block, fruit block, vegetables or high-yielding variety of wheat is equal to 0.67 acre sugarcane, and other hybrid crops like Hybrid jowar, 0.5 acre sugarcane, and other seasonal crops 0.33 acre sugarcane.

Hot weather: Acre under sugarcane and all hot weather seasonal crops treated on par, only acre under fruit block, garden block or vegetables equal to 0.67 acre of sugarcane.

A.14 From the above account it is clear that the last point in which the measuring device is fixed to measure the volume of water released is at the distributory head, beyond that point there is no provision for any measurement. Under the existing systems the farmers are at liberty to take as much water as they like, or till they are satisfied that the fields are fully irrigated, there is no time limit nor is there any volumetric measure of the water drawn.

## WATER RATES

A.15 At present the prime source for the recovery of capital and operation and maintenance costs for irrigation works is the water charge. Different rates are charged for each crop, roughly corresponding to the amount of water utilized. The following are the present rates charged for different crops.

Name of the Crop or Season	Rates (Rs. per hectare) w.e.f. 1-7-15 prevailing during 1978-19)
Sugarcane and Plantations	750
Other perennials	500
Kharif seasonal crops	50
Rabi seasonal crops	75
Hot weather seasonals	150
Hot weather cotton	250
Hot weather groundnuts	250
Pre-seasonal watering	75
Post-seasonal watering to kharif crops in rabi-season	20
Post Seasonal watering to rabi crops in hot weather season	25

A.16 A 20 per cent local cess is levied on the water rates. An Employment Guarantee scheme (EGS) cess is levied at the rate of Rs. 25 per hectare of irrigated land, and an Education cess varied with the crops grown as follows:

Crop	Rates (Rs. per hectare)
Sugarcane (perennials irrigation)	190
Sugarcane (on other lands)	110
Irrigated cotton	40
Hybrid seeds	40-110
Irrigated groundnuts	40
Fruits	80-380
Turmeric	80
Tobacco	130

## CHAPTER II

### Pattern of Use of Water Under Canal Irrigation

2.1 In order to estimate the most economic use of irrigation water, it is necessary, first of all, to ascertain the present pattern of use of canal water for different crops as well as the proper quantity and frequency of application of irrigation to different crops. Unfortunately, there is no information available about the quantity of water applied by farmers to fields growing different crops in the different seasons of the year, under any flow irrigation project in the state, the information available with the irrigation authority is briefly described below.

2.2 the information about the volume of water in the reservoir is available regularly and routinely. Daily information on the volume of water let out of the reservoir into the main canals is also maintained. The difference between the accretion plus depletion of water in the reservoir and its outflow through canals (and through the sluice gates, particularly in the rainy season) gives an estimation of the loss of water through seepage and evaporation. Similarly, for any period - a season or a year - the difference in the volume of water let out through the main canals, and the water let out from the canal to the distributaries (as well as given to other users) gives an estimation of the volume and proportion of water lost

through seepage and evaporation (mainly the former) in the main canals. The last routine measuring of the volume of water let out is at the distributary head. Beyond this there is no provision to routinely measure the volume of water let out from the distributary at the outlet to water courses, nor is there any direct or indirect measure of the volume of water taken by an irrigator. Therefore, there is no clear measure of the quantity of water lost in transit in the distributary and the water courses and the water actually applied to the field.

2.3 However, in order to supply water to the approved areas under different crops on the fields in a given season indeed during each rotation of water supply, it is necessary for the canal authority to have a clear idea of the amount of water needed per crop at the field head as well as the proportion of water, let out at the distributary head, that may be lost in transit through seepage, etc. The irrigation authority uses certain norm of water requirement of various irrigated crops at the field head. These are given in Col. 2 of Table 2.1. The seasonal break up of the water requirements for perennials and two seasonals are also worked out. Then, in order to estimate the water, requirement at the distributary head, an uniform 10 per cent loss is applied to the seasonal water requirement of each crop. The area under every irrigated crop under

Irrigation Department*		As per Lift Irrigation Scheme**		As per Agronomists' Specification***	
Crop	Acre Inches per acre	Crop	Acre inches per acre	crop	Acre inches per acre
(1)	(2)	(3)	(4)	(5)	(6)
1. Sugarcane (1 year)	113	1. Sugarcane (Adsali 18 months)	139	1. Sugarcane (1 year)	106.45
2. Plantains	112	2. Sugarcane (Suri 1 yr.)	127	2. Jowar CSH-5 (Kharif)	18.06
3. Lucerne, E.Grass, Guinea grass	112	3. Hybrid Jowar (Kharif)	9	3. Bajra (Kharif)	9.86
4. Vegetables in succession through out the	112	4. Bajra	6	4. Jowar CSH-1 (Rabi)	14.59
5. Papaya	87	5. Groundnut (Kharif)	6	5. Jowar CSH-BR (Rabi)	15.37
6. Citrus fruits	76	6. Rabi Jowar	12	6. Wheat (K.Sona)	15.69
7. Guava, Pomegranates	60	7. Hybrid Rabi Jowar	18	7. Wheat (N1-5439)	15.14
8. Rice (Kharif) Rice (Rabi)	30	8. Gram	9	8. Gram	11.83
9. Kharif Seasonals	10	9. Wheat	18	9. Groundnut (SB-XI)	12.62
10. Rabi Seasonals	10	10. Groundnut (Summer)	36	10. Sunflower	10.25
11. Hot Weather Seasonals	12 to 16	11. Cotton (Long Staple)	33	11. Cotton (RHR-253) Hot weather	35.49
12. Khapli Wheat	26				
13. Two Seasonal vegeta- bles	37				

\* Gandhi, P.R., op.cit., P. 31 \*\* A Note on Preparation of Lift Irrigation Schemes, Bombay: Government of Maharashtra, Irrigation and Power Department, 1970, P. 19 \*\*\* Obtained from Professor of Agronomy, Mahatma Phule Krishi vidyalaya, Rahuri, Maharashtra. These data ref. to consumptive use of water (Rainfall + irrigation) at field level.

the distributary is then converted into equivalent sugarcane area, by using a conversion chart, presumably based on the respective water requirements of various crops at the distributary head. This is illustrated for the Rabi and Hot weather seasons for the Nira Left Bank Canal in Table 2.2 the expected quantity of water that may be available per day of irrigation during the season at the distributary head (based on the experience of the previous

5 years), measured in terms of daycusecs (discharge rate at the distributary head in cubic feet per second multiplied by 24 x 60 x 60 seconds) is then used to divide the sugarcane equivalent planned irrigated area. This ratio, that is, the ratio of area irrigated (AI) to day-cusecs (DC) shows how many acres of sugarcane equivalent area can be irrigated with the discharge at the rate of one cusec water for 24 hours. This AI/DC ratio normally



varies from 3.5 to 4, depending upon mixture of crops in the command area of the distributory. It means, provision of water to irrigate about 4 acres of sugarcane upto a depth of 15 cm or 6 inches of water an acre during a day. The section officer in charge of the distributory can make minor variations in this from season to season, as long as the average AI/DC for the whole season- does not exceed the estimated level.

2.4 This means that the discharge of water through the distributory head is determined by estimations of water requirement at the field head and loss of water in transit. However, since there is no volumetric control on the supply of water to any field and since there is no definite information about the extent of loss in the distributory and field channels through seepage and theft, great variations in the rate of application of water not only among different crops but among different locations of the irrigated lands are very likely. It is, however, not possible to ascertain these without detailed measurements in the field.

2.5 Therefore, it is proposed to follow two approaches in estimating irrigation water requirements of the different crops. The first is to take the different norms specified by different agencies and choose one for our exercise. The other is to estimate the actual demand for water by different crops in a season at the distributory head. This may provide some

ground for a broad judgement about the loss of water in transit, which would raise questions about the steps to improve this as well as the present basis of official estimation.

2.6 Information on irrigation water requirements of different crops in the dry regions of Western Maharashtra, obtained from 3 different sources, is presented in Table 2.1. The data presented in Shri Gandhi's book (quoted in the Table) related to the figures generally used by the Irrigation department in its flow irrigation projects, after making suitable incrementals for canal and distributory losses, to arrive at estimates of demand for water for different crops at the main canal head. The data relating to requirements under lift irrigations can be considered as approximating to requirements at field level, since transit loss in such projects is sure to be minimal. The estimates obtained from the Agronomist include water obtained from rainfall, and therefore are sure to be more than needed from irrigation sources. The three sets of data are of course not the same; but considering the itemization of specifications and other non-comparability, we take the lift irrigation figures to be the approximate figures for our purpose. These approximate data on water requirement can help in the indirect assessment of loss of water in the distributories and water courses. We, therefore, now turn to the assessment of such losses.

**Table 2.2. Ratios to Convert Irrigated Lands Under Different Crops to Irrigated Sugarcane Land, and Nira Left Bank Canal**

	Crop	Conversion factor
	Rabi Season:	
1.	Sugarcane	100 %
2.	fruit Block	67 %
3.	Garden Block	67 %
4.	Vegetables in Sugarcane, two-seasonal and three seasonal Blocks	67 %
5.	High yielding wheat	67 %
6.	Hybrid millets	50 %
7.	Rabi seasonals	33 %
	Summer (Hot-weather):	
1.	Sugarcane	100 %
2.	Fruit Block, Garden Block, and vegetables in Hot Weather for one month	67 %
3.	Hot weather Seasonals	100 %

Source: P.R. Gandhi, op.cit. Statements 4 and 6

2.7 Before we turn to losses in the distributaries and minors, we may examine the losses in the main canal, i.e., PLBC. Table 2.3 gives the seasonwise and annual total loss of water let out at the canal head, during 1978-79. During the year, 33.81 per cent of the water let out into the main canal was lost in transit, mainly due to seepage and, to an undermined extent, pilferage. Seasonally, the greatest loss, 39.15 per cent, was during summer, and the lowest, 31.13 per cent, in the Rabi Season. This is much higher than the 20 per cent loss conventionally assumed by canal authorities in their calculation, including those for AI/DC at the canal head.

2.8 The Maharashtra State Irrigation Commission (1962) had examined this question at some length in its report. On the basis of data relating to canal losses on a number of major canals in the state in the preceding 15 to 20 years, the Commission observed great variations not only amongst canals, but even in the same canal from year to year. The range of variation can be seen from Table 2.4.

2.9 The Commission states<sup>[1]</sup> that the wide variation between the minimum and maximum is difficult to explain. It is often argued that the whole configuration of the state (through which the canal passes) and the sub-soil water level greatly influences losses in transit. This may at the most explain the difference

between the losses on one canal as compared to those on another canal. But this would not explain the large variations on the same canal from year to year. Such annual variations are sometimes attributed to changing weather conditions, such as temperature, pressure, wind velocity and to the condition of the canal section, i.e., with or without silt film. The Commission goes on to argue that losses by evaporation in the canal are very small compared to total losses and are, therefore, normally neglected. Weather conditions cannot explain such wide variations in canal losses. The other explanation based on the condition of the canal section, (i.e., with or without silt film) cannot also be a major factor in respect of those canals which have been functioning for many years and thus have attained a certain stability in their sections. The Commission then concludes that acceptance of the wide variation in canal losses, to the extent indicated in the table earlier, can therefore be attributed mainly to two undesirable factors, viz., (a) wasteful use of water, and (b) inefficient management. A third possibility could be the variation in the

**Table 2.3. Water Released at the Canal Head Received at the Distributory Head And Its Use (PLBC 1978-79)**

(1)	Season			
	All Seasons (2)	Kharif (3)	Rabi (4)	Summer (5)
Water released at PLBC head in day cusec	139170	49334	58483	31353
<b>Water received at distributory heads in day-cusec at</b>				
Ashwi	5062	1935	2140	967
Loni	7548	2530	3446	1752
Khandala	9376	2955	4383	2038
N.B.	27389	8905	11440	7044
Belapur	21458	6439	9705	5314
Vadala	5339	1876	2680	783
Karegaon	6668	23611	3470	637
Bel-Pimpalgaon	5418	1905	3011	502
Total including left and N.I.P.	88258	28906	40275	19077
Taklibhantail tank (T.T.T.)	3852	3852	-	-
Losses	47060	16576	18208	12276
	(33.81%)	(33.60%)	(31.13%)	(39.15%)

**Table 2.4. Range of Water Losses in the Main Canal, in Selected Major Canals in Maharashtra**

Canal	Rabi Losses		Hot Weather Losses	
	Minimum	Maximum	Minimum	Maximum
Nira Left Bank Canal	31	55	38	59
Nira Right Bank Canal	25	45	33	54
Pravara Left Bank Canal	21	40	23	57
Pravara Right Bank Canal	20	52	25	60
Godavari Left Bank Canal	13	33	8	36
Godavari Right Bank Canal	23	90	26	90
Girna Left Bank Canal	10	34	8	40

SOURCE: Maharashtra State Irrigation Commission Report, 1962. P. 139.

volume of flow of water in the main canal due to variations in main storage and variation in demand for irrigation, from year to year in a particular season. Since seepage loss in the main canal would very depending upon the area of canal surface in contact with water, the smaller the volume of water passing through the canal, the larger would be the proportion of loss through seepage. As per the Government of Maharashtra practice, the seepage loss in unlined main canals is assumed as follows:

- (i) 15 cusecs/Mcft for discharge less than 250 cusecs;
- (ii) 10 cusecs/Mcft for discharge above 250 cusecs.<sup>[2]</sup>

2.10 In point of fact, some of the canals on which test measurement were taken in 1978<sup>[3]</sup> showed average losses within these limits: for comparatively never

unlined canals the averages were very much in excess. The data also showed, in some cases, more than double the rate of seepage at two not distant points of time in the same section of the same canal, the only variation observed being the rate of discharge. This only verifies the general proposition about the percentage of seepage being negatively related to the rate of discharge. It, however, would be difficult to explain the very large variations over the years in the same canal, observed in Table 2.4. Therefore, the inference of the Maharashtra Irrigation Commission, that wasteful use (presumably including large scale pilferage) and inefficient management are the principal factors responsible, appears justified. This suggests great scope for improvement in these directions, even without lining of canals, so that more water is available for irrigation.

2.11 There are no such test data readily available concerning transit losses below the distributary head. The official estimates of water demand at distributary head assume a 10 per cent loss in transit. It was therefore decided to first of all estimate the rate of water use, cropwise, at the distributary head. This may be used for comparison with the conversion ratios at the distributary head used by the canal authorities. Then, with the available information (norms) about water requirements of different crops at the field head, it would be possible to get a rough estimate of the loss in transit below the distributary head.

2.12 Data were collected from the canal offices about the quantity of water let out into every distributary, separately, during every irrigation rotation during the year 1978-79. The area figure of individual crops under every distributary irrigated during a particular rotations was also collected. The PLBC has 80 distributaries or minors and 3 Lifts and the NLBC (non-perennial sections) has 13 distributaries and minors, the number of waterings, or rotations as they are called, in PLBC were, 5, 7 and 4 in Kharif, Rabi and Hot Weather, respectively during 1978-79. In NLBC, these were 3, 4 and 7 (excluding one in kharif and two rotations during Rabi when no irrigation was required due to adequate rain in time).

2.13 The total amount of water let out into a distributary and used by the command area under it, is dependent on the areas of different crops irrigated by the water during the rotation, besides the water lost in transit. This may be stated in a functional form:  $W = f(X_i)$

Where  $W$  is the volume of water let out into the distributary and  $X_i$  standing for the area of a crop irrigated,  $i = 1 \dots n$  standing for different crops. The following specific function was fitted to the available data:

$$W = a + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_nx_n$$

where  $W$  = the water let out into the distributary, in acre-inches

$a$  = a constant

$X_i$  = the area, in acres, of crops irrigated by the water,

$b_i$  = the regression coefficients, which indicate the additional water that would be needed, at the distributary head, to irrigate an extra acre of crop,  $X_i$ .

2.14 Regressions were run, separately for kharif, Rabi and Summer seasons for PLBC and NLBC, by taking the aggregate volume of water let out in every outlet during the total number of rotations in the season, and the corresponding areas of crops irrigated. The number of observations in each season, therefore varied from 79 to 82 for PLBC and 12 or 13 for NLBC due to one or two distributaries

receding no irrigation in a particular season. The results of the regression exercises are presented in Tables 2.5 and 2.6.

2.15 The constant term  $a$  has a negative sign while it should be normally positive. In any case, it is very small. Running the regressions without the constant term, therefore, does not materially alter the regression coefficients.

2.16 It is not surprising that the  $R^2$ 's are as high as they are, indicating a very good fit. Indeed, the maximum difference between the expected and observed variable ( $W$  and  $\bar{W}$ ), was less than 1.5 per cent in 2 out of 3 seasons and about 6 per cent in the third in PLBC. This is to be expected, since the water to be let out is calculated on the basis of the crop area to be irrigated and all the water is used up in the process.

2.17 The regression coefficients, which indicate the demand for water at the distributors head for an extra acre of the crop concerned, however, appear high in some cases. Sugarcane appeared to have used nearly 12 acre inches of water per acre per rotation at the distributory

head in the Kharif (monsoon) season under PLBC, almost the same as in summer: Though other perennials as well as seasonals, like hybrid jowar and groundnut in the kharif season, demanded about half as much water per acre as sugarcane, Bajra, another kharif seasonal, recorded very high demand for water, 10.6 acre inches, almost as much as sugarcane! In the rabi season not only was the demand for water for sugarcane (at distributory head) the lowest of all the 3 seasons, it was about the same as that of Rabi Jowar and wheat, while the other perennials had a marginally higher demand. In summer (hot-weather), on the other hand, it was just the reverse: other perennials required just about half the water by sugarcane in a rotation. The coefficients for Long Staple Cotton and groundnut appear extremely high: 26 acre inches for cotton and 14 acre-inches for groundnut per rotation. In NLBC, the regression coefficient for rabi Jowar appears high, but that for Gram is higher still, about 12.6 acre inches, which is similar to that in PLBC. In summer, cotton and groundnut also show very high demands, though somewhat lower than the same crops under PLBC.

**Table 2.5. Regression Coefficients of Different Crop Areas Under PLBC.**

Kharif N Season 81 (1)	Value $b_i$ (2)	Standard Error (3)	T. Test (4)
Constant Term	-151.89406	24.25656	-2.04553
Sugarcane ( $X_1$ )	11.90215	0.95028	12.52556**
Other Perennials ( $X_2$ )	6.48947	1.21669	5.33370**
Hybrid Jowar ( $X_3$ )	5.97189	0.43893	13.60557**
Bajra ( $X_4$ )	10.63263	1.18607	8.96458**
Groundnut ( $X_5$ )	6.16980	2.49538	2.47249*
Paddy ( $X_6$ )	7.66914	3.15292	2.43299*
Others ( $X_7$ )	1.71129	2.43404	0.70306
$R^2$	0.99189		
F	1275.79534		
Rabi N Season 82	Value $b_i$	Standard Error	T. Test
Constant Term	-140.38457	91.76761	-1.52978
Sugarcane ( $X_1$ )	7.55294	1.03046	7.32970**
Other Perennials ( $X_2$ )	8.04299	1.15123	6.98645**
Jowar ( $X_3$ )	7.14021	0.29476	24.22354**
Wheat ( $X_4$ )	7.76334	0.34950	22.21254**
Gram ( $X_5$ )	17.41328	2.28101	7.65404
$R^2$	0.99481		
F	2914.33269**		
Summer N Season 79	Value $b_i$	Standard Error	T. Test
Constant Term	-188.29855	83.53309	-2.25418**
Sugarcane ( $X_1$ )	12.15764	0.36809	33.02819**
Other perennial ( $X_2$ )	6.75009	1.47748	4.56863**
Cotton	25.98090	11.93810	2.17721*
Groundnut	14.29696	11.89097	2.39493*
other crop	14.29696	5.58544	2.55696*
$R^2$	0.96950		
F	464.12349**		

\*\* Significant at 1% level. \* Significant at 5% level

**Table 2.6. Regression Coefficients of Different Crop Areas Under NLBC**

Rabi Season	N	Value $b_i$	Standard Error	T. Test
(1)		(2)	(3)	(4)
Constant Term	13	-507.12105	1085614.065598	-1.69569
Jowar ( $X_1$ )		9.45030	694.79557	49.37364**
Gram ( $X_2$ )		12.69725	79608.91326	4.79667**
$R^2$		0.997658		
F		2148.10346**		
Summer Season	N	Value $b_i$	Standard Error	T. Test
	12			
Constant Term		-276.32482	1472192.21636	-0.68134
Cotton ( $X_1$ )		15.50360	7578.96702	7.42556**
Groundnut ( $X_2$ )		9.06448	6169.74742	5.33313**
$R^2$		0.99346		
F		683.24264**		

\*\* Significant at 1% level.

2.18 The above coefficients relate to the total supply of water at the distributory head during all the rotations in a season and the total of area under each crop irrigated in all those rotations. In view of the rather unexpected results from these total figures we decided to run regressions separately for each rotation in the season. The results are given in Table 2.7 and 2.8, the regression coefficients for any particular crop show wide variations from rotation to rotation in a given season. Variations in water requirements at the distributory head can be expected between rotations for a variety of reasons, but the estimated order of variation appears on the very high side.

2.19 Variations in demand for water at the distributory head are possible from season to season. Requirement for actual irrigation would vary, from rotation to rotation and even from distributory to distributory, depending upon whether there was rainfall in the area on the eve of the rotation, as well as on the state of moisture in the soil. This is more likely in the Kharif and the early Rabi seasons. Secondly, certain crops, like sugarcane and other perennials, need water in every rotation while many seasonal crops need water less frequently. Since there is no uniformity of cropping under irrigation in the area served even by a single water course, not to speak of a distributory, the



length of channels that water will have to travel to reach the fields to be irrigated is sure to vary from rotation to rotation and season to season. The longer the channel compared to the quantity of water applied to the field, the greater will be the loss in transit. Appendix Table A.2.1 and A.2.2, showing the area actually irrigated during different rotations in 1978-79, indicate the extent of this fluctuation. Distributory-wise this is even greater. Thirdly, the longer the interval between the two rotations, particularly in summer, more than proportionately greater the application of water in the fields. In the black cotton area, the soil dries and cracks up in a situation of prolonged absence of irrigation in the dry season. When finally water is available, the cultivator per force applies very large quantities of water in order to ensure that the root zone of the crop is fully wetted and more. Indeed, during visit to farmers' fields in Summer, we "heard" irrigation water flowing into the field but could not "see" it for quite some time: irrigation water was flowing considerably below the surface, making noise, and could be seen only through the very wide and deep cracks in the groundnut field. Under PLBC, in 1978-19, only four irrigations were provided during the summer, a smaller number than normally necessary:

therefore larger water application in the groundnut and cotton fields may be expected. In addition to the normal tendency of farmers to over-irrigate their fields, these abnormal situations lead to very high water application. Fourthly, loss of water in transit is partly due to defective state of the distributories and the outlets for the water courses. Finally, there is the very real situation of unauthorised and undetected and/or unaccounted use - simply "theft" - of canal water. While checking the irrigation use, through field visits, under one distributory in the Nira Canal System we came across some land, amounting to about 10 per cent of the total authorised irrigated land, supposedly under well irrigation, that was in fact using canal water unauthorisely for sugarcane. While this had been noticed, it could not be "detected" for what in local parlance are called "political" reasons. Besides these real circumstances on the ground, some of the regression coefficients would not be significant because of very small land area under irrigation during a season or rotation, as the case may be. Thus, the areas under paddy in Kharif and groundnut and cotton in the hot weather were small and scattered under many distributories, and are not likely to yield reliable results for that reason.

**Table 2.7. Regression Coefficients of Different Crop Areas Under PLBC, Rotationwise**

Equation	N	Constant term	Sugarcane X1	Other perennial X2	Hybrid Jowar X3	Bajra X4
(1)		(2)	(3)	(4)	(5)	(6)
<b>Kharif:</b>						
<b>Rotation I (K I)</b>						
1. b Value	63	-5.62487	7.01511	5.98199	7.09276	6.75923
2. Std. Error		11.36810	0.85867	0.98269	0.39745	1.35725
3. T. Test		-0.49479	8.16972	6.08732	17.84547	4.98007
<b>K II</b>						
1. b Value	83	7.43807	11.80879	-12.86054	6.58544	12.61984
2. Std. Error		32.88051	2.47009	2.47713	0.68606	1.30529
3. T. Test		0.22621	4.78070	-5.19169	9.59886	9.66758
<b>K III</b>						
1. b Value	82	-37.48893	9.09626	2.39066	6.35953	10.79831
2. Std. Error		19.43661	0.63910	1.41300	0.35593	0.90356
3. T. Test		-1.92877	14.23283	1.69189	17.86730	11.95082
<b>K IV</b>						
1. b Value	82	-43.99687	9.65803	8.00413	4.83670	13.67891
2. Std. Error		26.69495	0.88795	2.00350	0.64356	1.33565
3. T. Test		-1.64813	10.87677	3.99506	7.51546	10.24131
<b>K V</b>						
1. b Value	63	-29.34210	4.51604	9.41159	7.59833	13.72194
2. Std. Error		21.73752	0.95755	2.32189	0.38753	2.18846
3. T. Test		-1.34983	4.71620	4.053411	19.60680	6.27012

(Contd.)

Table 2.7 PLBC (Continued)

Equation	N	Groundnut X5	Paddy X6	Other X7	R <sup>2</sup>	F
(1)		(7)	(8)	(9)	(10)	(11)
Kharif:						
Rotation I (K I)						
1. b Value	63	6.35702	6.97429	9.12227	0.99334	1173.38680
2. Std. Error		1.71480	3.62564	2.04662		
3. T. Test		3.70713	1.92359	4.45723		
K II						
1. b Value	83	-7.72311	17.70275	6.18811	0.96615	385.89068
2. Std. Error		4.72589	4.12323	3.58100		
3. T. Test		-1.63421	4.29341	1.72803		
K III						
1. b Value	82	16.41012	15.48381	6.93103	0.99203	1317.20830
2. Std. Error		3.47553	2.06721	1.77466		
3. T. Test		4.72161	7.49016	3.90554		
K IV						
1. b Value	82	19.26381	9.76331	17.22388	0.98740	828.77029
2. Std. Error		4.96648	5.12934	2.99992		
3. T. Test		4.41182	1.90342	5.74144		
K V						
1. b Value	63	9.74379	4.15783	6.26941	0.97981	381.42766
2. Std. Error		2.96914	8.98187	2.42251		
3. T. Test		4.28168	0.46291	2.58797		

(Contd.)

**Table 2.7. (Contd.) PLBC Rabi**

Equation	N	Constant term	Sugarcane X1	Other perennial X2	Jowar X3	Wheat X4
(1)		(2)	(3)	(4)	(5)	(6)
<b>Rabi:</b>						
<b>Rotation I (R I)</b>						
1. b Value	81	-37.72509	5.12274	7.22678	7.32694	8.61036
2. Std. Error		24.66430	1.75614	1.92840	0.38252	0.45698
3. T. Test		- 1.52954	2.91704	3.74754	19.15409	18.84170
<b>R II</b>						
1. b Value	68	-19.15403	1.10783	5.33972	7.11636	8.56008
2. Std. Error		32.00877	1.56953	2.05983	0.37271	0.41136\
3. T. Test		-0.59839	0.70583	2.59230	19.09319	20.80891
<b>R III</b>						
1. b Value	58	-38.34778	6.68136	3.59079	6.82322	8.05660
2. Std. Error		34.61374	1.60453	2.20431	0.36959	0.51194
3. T. Test		-1.10787	4.16405	1.62898	18.46146	15.73729
<b>R IV</b>						
1. b Value	85	-34.82934	7.99042	5.70118	7.44281	8.00739
2. Std. Error		26.50265	0.56048	2.04261	0.25561	0.28701
3. T. Test		-1.31418	14.25619	2.79112	29.11690	27.89891
<b>R V</b>						
1. b Value	82	-34.95492	11.98083	8.43387	7.96800	6.88939
2. Std. Error		15.70202	1.15795	1.16625	0.38925	0.24513
3. T. Test		-2.22614	10.34657	7.23158	20.46997	28.10429
<b>R VI</b>						
1. b Value	78	-22.82664	9.48302	4.66808	5.86677	7.80545
2. Std. Error		19.93500	1.38239	1.35575	0.41610	0.30822
3. T. Test		-1.14505	6.85983	3.44315	14.09916	25.32392

(Contd.)

Table 2.7 PLBC (Continued)

Equation	N	Groundnut X5	Paddy X6	Other X7	R <sup>2</sup>	F
(1)		(7)	(8)	(9)	(10)	(11)
Rabi:						
Rotation I (R I)						
1. b Value	81	9.44814	0.99013	1505.30643		
2. Std. Error		1.97990				
3. T. Test		4.77202				
R II						
1. b Value	68	26.24598	0.98322	727.01053		
2. Std. Error		3.26476				
3. T. Test		8.03915				
R III						
1. b Value	58	13.47218	0.98855	989.07938		
2. Std. Error		2.93138				
3. T. Test		4.59583				
R IV						
1. b Value	85	9.09900	0.99289	1983.46052		
2. Std. Error		2.21425				
3. T. Test		4.10927				
R V						
1. b Value	82	9.69477	0.99379	2433.75469		
2. Std. Error		2.39589				
3. T. Test		4.04651				
R V						
	78	11.41300	0.98494	942.00428		
		5.32765				
		2.14221				

(Contd.)

Table 2.7. PLBC - Summer (Contd.)

Equation	N	Constant term	Sugarcan e X1	Other per ennial X2	Cotton X3	Ground nut X4	Other crops X5	R <sup>2</sup>	F
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Summer:									
Rotation I (S I)									
1. b Value	74	-15.8576	11.62890	6.98706			8.4822	0.96764	697.9130
2. Std. Error		6	0.45561	0.64023			0.72335		1
3. T. Test		9.96217	25.52358	10.91326			11.7262		
		-1.59819					8		
S-II									
1. b Value	66	-14.9323	11.36003	8.93170	11.43648			0.95609	450.0943
2. Std. Error		8	0.41867	0.63888	6.22469				3
3. T. Test		10.96935	27.13321	13.98006	1.83727				
		-1.36128							
S-III									
1. b Value	82	166.3845	10.03276	2.6U24	22.61816	10.7965	49.7935	0.40341	18.27831
2. Std. Error		1	1.98811	13.21167	49.66897	1	3		
3. T. Test		152.1440	5.84183	0	0.45537	54.6537	77.9570		
		4		0.19764		5	3		
		1.09307				0.19754	0.63873		
S-IV									
1. b Value	79	-38.4679	12.29322	8.08767	45.54884	11.1486	13.2554	0.93436	207.8263
2. Std. Error		2	0.48106	3.93600	19.32167	9	4		9
3. T. Test		50.72685	20.55438	2.05479	2.35739	19.8731	28.1490		
		-0.68062				0	3		
						0.56099	9.47090		

**Table 2.8. Regression Coefficients of Different Crops and NLBC, Rotationwise**

Equation (1)	N	Constant term (2)	Jowar X1 (3)	Gram X2 (4)	R <sup>2</sup> (5)	F (6)
<b>Rabi Season</b>						
<b>Rotation III (R-III)</b>						
1. b Value	8	-97.64318	10.50899	2.21349	0.99167	297.83022
2. Std. Error		197.24226	0.78141	4.03622		
3. T. Test		-0.54475	13.448702	0.54840		
<b>R-IV</b>						
1. b Value	12	-55.01964	9.40166	28.42759	0.98982	437.94000
2. Std. Error		344.67035	0.36182	5.87511		
3. T. Test		-0.15962	25.98389	4.83864		
<b>R-V</b>						
1. b Value	13	-97.70497	9.03065	-2.19806	0.99903	5176.83373
2. Std. Error		67.03470	0.11985	3.53225		
3. T. Test		-1.45752	75.34746	-0.62228		

Note: No irrigation during the first two rotations.

**TABLE 2.8. (Contd.) NLBC - Summer Season**

Equation	N	Constant Term	Cotton	Groundnut	R <sup>2</sup>	F
<b>Summer:</b>						
<b>Rotation I (S I)</b>						
1. b Value	12	8.63003	11.80336	-	0.96046	262.97186
2. Std. Error		59.38016	0.75722			
3. T. Test		0.14533	15.58755			
<b>S-II</b>						
1. b Value	12	-0.46553	12.34322	10.99351	0.99094	492.34321
2. Std. Error		56.26690	1.00148	1.93193		
3. T. Test		8.27376	11.21959	5.69041		
<b>S-III</b>						
1. b Value	12	373.12159	-0.06555	7.68032	0.66560	8.95732
2. Std. Error		204.16646	6.70690	4.85072		
3. T. Test		1.82753	-9.77393	1.58333		
<b>S-IV</b>						
1. b Value	8	-265.33015	1.40343	30.84107	0.95051	48.02013
2. Std. Error		292.00810	4.29752	3.33218		
3. T. Test		-0.90863	0.32656	9.25550		
<b>S-V</b>						
1. b Value	12	-119.53730	15.00112	11.92668	0.99215	569.39442
2. Std. Error		57.77204	1.94382	1.76959		
3. T. Test		-2.06912	7.71732	6.73977		
<b>S-VI</b>						
1. b Value	12	-138.18565	17.74997	8.70028	0.98870	393.73351
2. Std. Error		123.32895	2.95230	1.69507		
3. T. Test		1.12046	6.01223	5.13268		
<b>S-VII</b>						
1. b Value	9	41.98032	6.82377	15.01317	0.99889	1865.40597
2. Std. Error		36.97455	1.83228	1.44831		
3. T. Test		1.13538	3.72419	10.36598		

2.20 All these go to suggest that, in the first place, the norms about the quantum of water demanded at the distributory or canal heads used by the irrigation department are quite different from what is actual on the ground. The conversion ratios used to convert all irrigated crop areas to sugarcane equivalent area were presented in Table 2.2. Now, in Tables 2.9 and 2.10 we present the water requirements at the canal head for different crops, as given in the Maharashtra State Irrigation Commission's Report (1972), and the requirements at the distributory head on the basis of our regression coefficients for PLBC, respectively. Apart from the fact that the Commission's figures refer to demand at the main canal head (which make the figures appear much lower than warranted in terms of our distributory head estimates) the intercrop variations are also quite significant.

2.21 Secondly, these discussions also suggest that there is considerable scope for improvement in the maintenance and management of the canal system and the pattern of water supply, all of which would reduce the loss of water in transit as well as on the field and thereby make lower demand for water at the canal/distributory head for irrigating a given crop pattern.

2.22 Since no firm information is available about the actual application of irrigation water by farmers in the field, we propose to use the data put out by the Irrigation Department for the Lift Irrigation Schemes (See Table 2.11, which is the same as in column 3 and 4 of Table 2.1 given separately for Kharif, Rabi and Summer seasons), which broadly relate to field level requirement of irrigation, to estimate the loss of water in transit below the distributory head, in the year 1978-79. The method used is as follows: The total irrigation water required in one season at the field level is taken as that given in Table 2.11. But the actual number of irrigations available to a crop in the particular season during 1978-79 in PLBC/NLBC was different from the number of irrigations specified in the Lift Scheme (Table 2.11). We have estimated the water per irrigation for a particular crop in a season to be the total water required for the crop in the season divided by the number of irrigations actually available. The actual water let out through the distributaries and the quantity required for irrigation, calculated in this manner are presented below in Tables 2.12 and 2.13.

2.23 We find that, on the whole, 50 per cent of the water let out into the distributories was necessary for irrigating the standing crops in the fields in PLBC: the remaining 50 per cent was



**Table 2.9. Water Requirements of Crops at the Canal Head as Gives in Irrigation Commission's Report**

(In Acre inch)

Name of the crop	No. of waterings	Quantity per watering	Total	No. of waterings	Quantity per watering	Total	No. of waterings	Quantity per watering	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	-----Kharif-----			-----Rabi-----			-----Summer-----		
Sugarcane	7	5.2	36.4	15	5.2	78.0	12	5.2	62.4
Other perennial	7	5.2	36.4	15	5.2	78.0	12	5.2	62.4
Kharif Jowar	2	3.9	7.8	-	-	-	-	-	-
Bajra	2	3.9	7.8	-	-	-	-	-	-
Groundnut	2	3.9	11.7	-	-	-	-	-	-
Paddy	5	5.2	26.0	-	-	-	6	3.9	23.4
Jowar	-	-	-	4	3.9	15.6	-	-	-
Wheat	-	-	-	6	3.9	15.6	-	-	-
Cotton	2	3.9	7.8	2	3.9	7.8	7	3.9	27.3
Gram	-	-	-	3	3.9	11.7	-	-	-

Source: Maharashtra state Irrigation commission Report (1972), Table 36 and 37.

**Table 2.10. Water Requirement of the Crops at Distributory Head as Estimated Through Regression**  
(Acre inch)

	-----Kharif-----			-----Rabi-----			-----Summer-----		
Name of the crop	No. of waterings	Quantity per watering	Total	No. of waterings	Quantity per watering	Total	No. of waterings	Quantity per watering	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sugarcane	5	11.90	59.50	6	7.55	45.30	4	12.16	48.64
Other perennial	5	6.49	42.25	6	8.04	48.24	4	6.75	27.00
Hybrid Jowar	3	5.97	17.91						
Bajra	2	10.63	21.26						
Groundnut	3	6.17	18.51				2	14.30	26.60
Paddy	4	7.66	29.64						
Jowar	-			3	7.14	21.42			
Wheat	-			4	7.76	31.04			
Gram	-			3	17.41	52.23			
Cotton	-						3	25.98	77.94

NOTE: The canal ran for 5 rotations (watering) in kharif, 6 rotations in rabi and 4 rotations in hot weather season in 1978-79. But, except for sugarcane and other perennials no other crop is necessary irrigated in all the waterings.

therefore lost in transit. In NLBC (non-perennial section) the use was only about 45 per cent: 55 per cent was lost in transit. The seasonal variation was quite significant. In PLBC the percentage of water used was the lowest in Kharif, 43 per cent, and highest in summer, 72 per cent. In NLBC, it was just the reverse: 63 per cent in Kharif and 38 per cent in Summer. While concentration of sugarcane area under irrigation in Summer in PLBC may account for the high utilization level in that season, the variations are too much. The factors discussed earlier (para 2.19) surely must be responsible for this.

2.24 We noted earlier that nearly 34 per cent of the water let out into the Pravara Left Bank Canal in 1978-79 was lost in transit in the main canal. Of the 66 per cent water let out into the distributaries only half was estimated to be used on the field. This means, of the total water let out into the canal, roughly one-third was lost in the main canal, another one-third in the distributaries and water courses, and only one third was used by the farmers on their fields.

2.25 While these estimates are based on norms, rather than on the basis of actual field measurements, they appear to agree with similar estimates made by researchers in the Water and Land Management Institute at Aurangabad (Maharashtra). Dhamdhare and Padhye in

discussing the scheduling of irrigation, illustrated for the Mula Irrigation System, write: [4]

"Based on the losses actually observed, following efficiencies are assumed:

	Cumulative losses from Read works	Efficiency
Distributary Head	28	72
Minor Head	35	65
Outlet Bead	42	58
Turn Out (Farm gate)	53	47
Root Zone	65	35

While the authors do not cite any source or give information about the "actual observations", it is presumed it relates to their measurements on the Mula system. It shows a loss of 28 per cent in the main canal, against 34 per cent in PLBC in 1978-79. Between the distributary head and the field head 25 per cent of the water is lost, according to their estimates, while ours comes to 33 per cent. While our estimate of loss on the main canal is based on actual measurements the loss below the distributary head is an estimate. If we assume their estimates for Mula to apply to PLBC as well, the total water lost in transit will be 59 per cent (34+25). The high percentage loss of water in transit is borne out. This is not entirely due to unavoidable seepage in unlined canals. The bad maintenance, and management

of canal and undetected unauthorised use of water are also important reasons for this.

2.26 There appears very considerable scope for improvement in the management and maintenance of the canal sys-

tem. Moreover, proper assessment of need of irrigation water at different stages of the growth of a crop, determination of the frequency of water supply to the crop and design of a system of delivery that will

**Table 2.11. Irrigation Water Requirement of Crops as Prescribed in the Lift Irrigation Schemes, Government of Maharashtra**

(Acre inch)

Name of the crop	Kharif			Rabi			Summer		
	No.of waterings	Quantity per watering	Total	No.of waterings	Quantity per watering	Total	No.of waterings	Quantity per watering	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Sugarcane	4	3.0	12.0	12	3.5	42.0	12	4.5	54.0
Other perennial	4	2.4	10.0	12	2.5	30.0	12	3.0	36.0
Kharif Jowar	2	3.0	6.0	-	-	-			
Bajra	2	3.0	6.0	-	-	-			
Groundnut	2	3.0	6.0	-	-	-	12	3.0	36.0
Paddy	2	4.0	8.0	-	-	-	5	4.5	22.5
Jowar	-	-	-	4	3.0	12.0	-		
Wheat				6	3.0	18.0			
Gram				3	3.0	9.0			
Cotton	2	3.0	6.0	2	3.0	6.0	7	3.0	21.0

**Table 2.12. Estimated Utilisation of Water as Proportion to the Actual Amount of Water Released from Distributory Head Under PLBC**

Season	Water actually released in the distributories/ minors in acre inches	Estimated utilisation of water at the field level acre inches	Percentage utilisation at field level
Kharif	291121	123892	42.56
Rabi	497759	236458	47.50
Summer	161830	116290	71.86
Total	950710	426640	50.14

**Table 2.13. Estimated Utilisation of Water as Proportion to the Actual Amount of Water Released from Distributory Head Under NLBC (non-perennial zone).**

Season	Water actually released in the distributories/ minors in acre inches	Estimated utilisation of water at the field level acre inches	Percentage utilisation at field level
Kharif	454546	34330	62.95
Rabi	146106	61972	42.42
Summer	94511	35732	37.81
Total	295163	132034	44.73

ensure delivery of the required quantity of water at the field level will ensure more efficient use of irrigation water than is practiced today. It is proposed to discuss these questions in a general way at a later stage. The next chapter will take the present estimated water requirements at the field level for granted, and examine the economics of the use of water under the existing crop pattern and any alternatives, with a view to maximising returns per unit of water.

**NOTES**

1. *Maharashtra state Irrigation Commission Report, 1982*, p. 139.

2. *Maharashtra Composite Irrigation Project: Feasibility Report*, New Delhi: Water and Power Development Consultancy Service (India) Ltd., May 1979, Vol. I, pp. 43-45.

3. *Ibid.*

4. Dhamdhare, H.V. and Padhye, V.S. "Scheduling of Irrigation", published in *National Workshop in Scheduling of Irrigation*, Nov. 12-13, 1983; Aurangabad: Water and Land Management Institute, November 1983 (Publication No.5), p.42.

**APPENDIX TABLES****Table A.2.1. Irrigated Area Under Different Crops During each Rotation, Under PLBC, 1978-79**

(Area in Acres)

Season Rotation/ Sugarcane	Other Perennials	Hybrid Jowar	Bajra	Groundnut	Paddy	Others	Total
Kharif:							
1. 985.92	436.58	2585.89	392.64	164.99	85.63	123.5	4774.90
2. 1183.89	473.83	5862.59	1117.65	267.01	189.5	489.46	9583.93
3. 1937.43	465.83	6380.23	1041.52	277.36	205.0	471.14	10778.51
4. 2319.83	471.98	5609.38	924.26	261.11	187.5	409.38	10191.44
5. 1332.73	337.75	3222.14	228.35	172.01	74.25	163.77	5531.00
K.Total 7759.80	2185.97	23660.23	3704.42	1142.48	741.88	657.25	40859.78

**Table A.2.1. (Contd.)**

Rabi	Sugarcane	Other Perennials	Jowar	Wheat	Gram	Total
1	1249.12	440.13	6021.03	3992.60	392.24	12094.92
2	1235.23	395.48	3131.51	5145.21	209.64	10121.07
3	1306.21	3257.50	3163.14	5474.16	360.76	10629.77
4	1745.69	426.40	5490.86	8096.06	435.13	16194.14
5	1306.65	264.80	1235.18	6972.25	191.70	9970.58
6	1074.52	430.91	1178.47	4991.14	63.00	7738.04
R.Total	7917.42	2283.22	20220.19	34671.42	1648.47	66748.52

Summer	Sugarcane	Other Perennials	Cotton	Groundnut	Others	Total
1.	1050.77	428.28	-	44.0	421.89	1900.94
2	1007.03	422.78	22.26	-	1.5	1452.07
3	4425.60	412.78	60.56	64.0	40.5	5003.44
4	5033.01	447.78	43.13	64.0	31.15	5619.07
S.Total	11516.41	1711.62	125.95	172.0	495.04	13975.52

**Table A.2.2. Irrigated Area Under Different Crops During each Rotation, Under NLBC, 1918-19**  
(Area in acres)

Season Rotation/ Sugarcane	Groundnut	Cotton	Hybrid jowar	Bajra	Tur	Maize	Fodder	Total
Kharif:								
1	928.00	888.25	956.25	187.00	90.50	140.5	7.5	3198.00
2	1564.5	1615.5	1006.75	699.13	225.00	262.5	8.0	5381.38
3	271.38	428.5	953.5	271.75	207.00	239.0	7.5	2378.63
4	10.00	60.0	28.0	-	-	-	-	98.00
K.Total	2773.88	2992.25	2944.5	1157.88	522.5	642.0	23.0	11056.01

Table A.2.2. (Contd.)

Rabi	Jowar	Gram	Total
3	2226.38	252.9	2479.28
4	6461.05	359.5	6820.55
5	5790.86	173.4	5964.26
6	208.00	47.0	255.00
R. Total	14686.29	832.8	15519.09

Summer	Cotton	Groundnut	Total
1	562.00	-	562.0
2	748.88	359.13	1108.01
3	528.75	606.14	1134.89
4	273.00	485.11	758.11
5	772.26	995.88	1768.14
6	793.38	1032.08	1825.46
7	400.00	437.88	837.88
S.Total	4078.27	3916.22	7994.49

Note: The first two rotations in Rabi were not given since there was sufficient rainfall at the times.

### CHAPTER III

#### Economics of the Use of Irrigation Water

3.1 Irrigation in the dry, drought prone regions of Maharashtra is mainly sugarcane centred. A little over 10 per cent of the total irrigated area in the State is under sugarcane. However, since sugarcane is a heavy water using crop compared to others, it used between 50 to 60 per cent of the total irrigation water in the State. Sugarcane is concentrated in the dry, drought prone regions; and, therefore, the percentage of irrigation water used by sugarcane in this region is likely to be even higher.

3.2 Does this pattern of use of water give the best return per unit of water? The question is particularly relevant in the context of canal water which can be used in varying amounts and for varying periods during the 8 months after the supply reservoir is filled by the beginning of October every year. The same approach would not work for wells, though given his endowments of land and water, the irrigator with a well may also be expected to maximise return per unit of the factor in relatively short supply. In order to estimate the net returns to the farmer per unit of water under canal

irrigation, it is necessary first of all to find out the net returns per acre of different irrigated crops. Then the returns per unit of irrigation water used in different crops/crop rotations can be calculated and compared.

3.3 For this purpose two different sources of data are sought to be used. The first is a survey into the costs and returns of a sample of farmers selected from the command areas of PLBC and NLBC (non-perennial zone), relating to the year 1978-79. The second is the data extracted from the enquiries into costs of production of farm products, conducted by the Ministry of Agriculture of the Government of India, in all regions since 1972-73. We have used the data relating to the irrigated crops in the samples drawn from regions in or near which our selected command areas are located. We present below brief accounts of the composition of the sample farms and the costs and returns relating to different crops from these two sources.

### THE SAMPLE

3.4 The Pravara Left Bank Canal had approximately 25,000 acres of net irrigated area (1978-79), of which 22,000 acres came under perennial irrigation zone and around 2,300 acres under non-perennial irrigation zones. As mentioned earlier non-perennial zone is a zone

where no perennial crops are allowed to be grown on canal water. It was decided to cover a 5 per cent sample of the irrigated area each from the perennial part and non-perennial part, which amounted to 1,100 acres and 115 acres, respectively. The entire length of the left bank canal was divided into 4 parts, each part having roughly 25 per cent of the irrigated area. In the next stage such number of the distributories from each part were chosen at random so as to cover roughly 275 acres from each part in the perennial area of the canal. The third stage of the sampling was to cover all the beneficiary farmers under the command area of the selected distributaries. However, wherever because of the inclusion of a large distributory/water course, the total irrigated area exceeded 275 acres, the beneficiary farmers in such distributaries were again chosen randomly so as to confine the area surveyed to around 275 acres. Similarly, from the nonperennial area the distributaries were chosen randomly, so as to cover around 115 acres of irrigated area, and all the beneficiary farmers were covered under those distributaries. Similar procedure of sampling was followed in case of the Nira Left Bank Canal (non-perennial zone).

3.5 The household size and agricultural worker composition of the sample households classified according to their

size of operated land holding are presented in Appendix Tables A.3.1 and A.3.2 Size of the household, the number of agricultural workers per household and the number of annual farm servants per household increases with the size of operated holding.

3.6 The smallest size group of operational holdings, with 5 acres or less of land, constituted 40.5 per cent of all cultivators, but cultivated only 13.3 per cent of the total cultivated land. On the other hand, the largest cultivating households, with holdings of more than 10 acres, constituted 28 per cent of all cultivators, but cultivated 60.9 per cent of all cultivated land, in PLBC area (Ref. Appendix Table A.3.3). The average size of operational holdings was 9.35 acres.

3.7 In NLBC (non-perennial zone), the size distribution was somewhat different. Here the large size farmers constituted the largest single group, 42.73 per cent of all cultivators and accounted for 74.26 per cent of all cultivated land. The small and medium cultivators were in roughly equal proportions, though of course the medium operated about 3 times the land area operated by the small. This was a region of comparatively larger holdings than PLBC area. The average size of holding was 11.53 acres (Ref. Table A.3.4).

3.8 Only one-third of the total operated land of the cultivators under the PLBC command, was irrigated by the canal. Another 42 per cent of their land was irrigated by wells in or near the command area. One-fourth (24.67 per cent) of their land was without any irrigation facility. Size-wise the smallest cultivators had the maximum, i.e., 51.68 per cent of their land irrigated by the canal, the largest had only 29 per cent of their land under canal. Incidence of well-irrigation however was less uneven: the smallest had 36.23 per cent well irrigated land while the largest had 40.22 per cent: only the middle farmers had about 50 per cent of their land under wells. Therefore, the unirrigated lands with the smallest sized farmers was only 12 per cent while in case of the largest it was nearly 31 per cent.

3.9 In the non-perennial zone under NLBC, on the other hand, much smaller per cent of the total operated area of the cultivators in the command area, 18.58 per cent only, was under canal irrigation. Land under wells accounted for another 20 per cent, leaving more than 61 per cent of the total operated area of the farmers unirrigated. Here also the smallest farmers had nearly half their land irrigated by canals, the medium about 30 per cent, while the large farms only 13 per cent. The extent of well irrigation did not vary significantly among the three size-classes. Greater irrigation facility has, all



along in India, been associated with small average size of land holding. That again appears to be borne out by the difference between PLBC and NLBC (non-perennial) regions, observed here. Another point worth noting in the context of these two regions is that larger the proportion of operated area of farmers covered by canal water, the larger the extent of well irrigation. This is plausible, since the wells are able to tap and recycle seeped canal water, and greater the coverage under canals, greater this possibility of tapping underground water.

3.10 The cropping pattern of the sample farms is presented in Appendix Tables A.3.5, A.3.6, A.3.7 and A.3.8 for the two regions separately. Under PLBC, only 5 per cent of the gross cropped area, canal irrigated, was under sugarcane. This is broadly in keeping with the sugarcane block area mentioned earlier. However, nearly four times as much sugarcane land, normally irrigated by wells were provided with 2/3 irrigations from the canal in summer. If we add this area as well as the sugarcane area which was an overlap of 1977-78 year and took water pending harvest, mainly in the Kharif and early Rabi seasons, to the gross cropped area under canal as well as to area under sugarcane, we find that nearly 24 per cent of the gross cropped area under canal was under sugarcane. Cereal crops, millets and wheat

accounted for the bulk of the canal irrigated land. As against this, not only was the total area under well irrigation under PLBC higher, but the area under sugarcane was nearly 28 per cent of the gross irrigated area under wells. If we add the sugarcane overlap area to the total as well as to the sugarcane area, sugarcane accounts for nearly 40 per cent of the gross irrigated area under wells. The area under well irrigated millets was just about as large as the area under sugarcane. Wheat was another important cereal. Long staple cotton was grown mainly under well irrigation in summer, while it was very little under canal. Besides, a wide range of seasonal crops as well as fodder and lucerne were grown mainly under well irrigation. In the unirrigated portion of the land holdings of the sample farmers the main crops grown were local variety of jowar in the Rabi season (nearly 70 per cent of the gross cropped area), bajra and a variety of pulses in the kharif season.

3.11 The distribution of the total gross cropped area (irrigated plus unirrigated), according to the size class of land holdings, is presented in Appendix Tables A.3.7 and A.3.8. An interesting fact to note in this context is that while the small farmers had more than half their land irrigated by canal and nearly 88 per cent of their total land irrigated from either

source, the area under sugarcane constituted just about 10 per cent of their gross cropped area. What is more, most of this sugarcane was under wells: the sugarcane area under canal in their case was very small, constituting less than 1 per cent of their net irrigated area under canal. (Data not separately presented.) Out of the total sugarcane area under canal (excluding overlap area), 60 per cent was with the large farmers, over 38 per cent with the medium, and only about 2 per cent with the small farmers, while they occupied 53, 26 and 21 per cents, respectively of the total canal irrigated land. Even if we include the overlap sugarcane areas, the distribution amongst the size classes remains broadly unchanged. This shows that, under the block system of giving canal water to sugarcane land, the small farmers had little place; the blocks were mainly with the medium and large farmers, more so with the latter. The small farmers were recipients of canal water for seasonal crops (presumably under Form VII which is given after the available water has been apportioned to the various block areas). We shall return to this inequality of distribution of sugarcane blocks among farmers of different size holdings in a later chapter.

3.12 In the non-perennial zone of NLBC the canal irrigated land was devoted to mainly 3 crops: Rabi jowar, Kharif and Summer groundnut and long

staple cotton in summer. Under well irrigation about 10 per cent of the gross cropped area was under sugarcane. Wheat, maize and cotton were the other important crops, besides Rabi jowar. Here too, like under wells in PLBC command areal a number of other seasonal crops were grown in the kharif and Rabi seasons, a phenomenon much less visible in the lands irrigated by the canals. On the unirrigated lands, which formed the bulk of the total cultivated area, Rabi jowar and Kharif pulses were the only two crops being grown.

### **NET INCOME FROM IRRIGATED CROPS**

3.13 Detailed data on inputs, costs and outputs, cropwise, were collected from the sample farmers. These were valued at the prevailing prices paid or received by the farmers during the year. The net income per acre was calculated for the various crops grown by the farmer under canal and well irrigation, as well as under rainfed condition. The net income was calculated by valuing the main product plus the by-product, if any, of a crop and deducting from this the values of all material inputs, whether purchased or home-supplied, including feed, fodder, etc., expenses of bullocks or cost of hiring bullocks, irrigation costs and the wages paid to casual or annual farm workers hired for operations on the crop and imputed wages of family labour. The

average per acre costs and returns for a 3.14 We examined such data separately for farmers in the three different number of irrigated crops are presented in Tables 3.1 and 3.2 for PLBC and size classes of land holdings (data not NLBC, respectively. presented here),

**Table 3.1. Cost and Return per Acre of Principal Crops Grown in PLBC Command Area, as per Sample Survey**

Name of the crop	Seed (Kg.)	F.Y.M. (cart load)	Fertilizer (Kg.)	Pesticide	Cultivation exp. incl. labour	Irrigation charges	Total cost	Main product (Quin)	By product (stalks)	Gross income	Net income (11-8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Sugarcane	Q.13000	10	700	-	-	-	-	37	-	-	-
	sets							tons			
Value	Rs. 600	150	1050	-	1000	550	3350	4810	-	4810	1460
2. Hybrid Jowar	Q. 3	2	50	-	-	-	-	7	300	-	-
Value	Rs. 35	30	75	20	280	30	470	735	113	848	378
3. Jowar	Q. 4	2	25	-	-	-	-	4	300	620	-
Value	Rs. 8	30	40	-	220	30	328	500	120	620	292
4. Bajra	Q. 2.5	2	20	-	-	-	-	-	280	-	-
Value	Rs. 9	30	30	-	230	30	320	375	100	475	155
5. Wheat	Q. 40	1	85	-	-	-	-	6	6	-	-
Value	Rs. 88	15	130	15	280	30	558	900	50	950	392
6. Gram	Q. 25	-	-	-	-	-	-	2	-	-	-
Value	Rs. 50	-	-	-	160	30	240	360	30	390	150
7. Cotton	Q. 2	5	160	-	-	-	-	4	-	-	-
Value	Rs. 75	75	225	150	400	60	985	1600	-	1600	615
8. Groundnut	Q. 30	6	70	-	-	-	-	5	-	-	-
Value	Rs. 165	90	105	-	320	50	730	1250	-	1250	520
9. Fodder (lucerne grass)	Q. 16	30	300	-	-	-	-	530	-	-	-
Value	Rs. 640	450	450	30	350	100	2020	2915	-	2015	895
10. Onion	Q. 3	10	150	-	-	-	-	6	Tons	-	-
Value	Rs. 150	150	225	150	480	50	1205	2100	-	2100	895

**Table 3.2. Cost and Return per Acre of Principal Crops Grown in NLBC (Non Perennial Zone) Command Area, as per Sample Survey**

Name of the crop	Seed (Kg.)	F.Y.M.	Fertilizer	Pesticide	Cultivation expenses	Irrigation charges	Total cost	Main product	By product	Gross income	Net income (11-8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Sugarcane	Q.12500 sets	10C.L.	800kg	-	-	-	-	38 tonnes	-	-	-
Value	Rs. 565	180	1200	-	1000	550	3495	4940	-	49940	1445
2. Hybrid Jowar	Q. 3kg	5C.L.	60kg	-	-	-	-	8Quin. 300stalks	-	-	-
Value	Rs. 35	75	90	20	280	30	530	850	100	940	410
3. Jowar	Q. 4kg	3C.L.	25	-	-	-	-	3Quin. 280	-	-	-
Value	Rs. 8	45	35	-	200	30	318	375	100	475	157
4. Bajra	Q. 2kg	2C.L.	-	-	-	-	-	2Quin. 250stalks	-	-	-
Value	Rs. 7	30	-	-	200	20	257	250	100	350	93
5. Wheat	Q. 40kg	3C.L.	100kg	-	-	-	-	6Quin. 6 quin.	-	-	-
Value	Rs. 80	45	150	15	280	30	600	900	50	950	350
6. Gram	Q. 20kg	-	-	-	-	-	-	2Quin. -	-	-	-
Value	Rs. 50	-	-	-	180	30	260	375	20	395	135
7. Cotton	Q. 2kg	12C.L.	150	-	-	-	-	4Quin. -	-	-	-
Value	Rs. 70	120	200	150	400	60	1000	1600	-	1600	600
8. Groundnut	Q. 40kg	10C.L.	30kg	-	-	-	-	5.5Quin. -	-	-	-
Value	Rs. 200	160	45	-	350	50	805	1375	-	1375	570

but did not find any significant differences among these. Difference between canal and well irrigation, in terms of inputs and outputs were not noticeable in case of many crops, like jowar, bajra, groundnut, etc. But in case of three crops, namely sugarcane, wheat and long staple cotton, the inputs, mainly fertilizer application, were somewhat higher on the well irrigated lands and so was the output per acre. As against this the labour cost per acre was higher on canal irrigated

lands, particularly for sugarcane, and the cost of irrigation was higher under well irrigation. The relatively higher fertilizer application on these crops, irrigated by wells, was possibly due to the greater control over water supply, particularly in terms of frequency and timeliness. Fertilizer is applied on the eve of water application, and there is longer interval and greater uncertainty associated with canal irrigation. The higher labour charge is presumably due to the practice of

contracting out of a number of operations on the sugarcane field, particularly by the large and even some medium farmers who alone were having canal water for sugarcane, while the small farmers who had almost entirely well irrigation used less of hired labour and there too less contracting out of work to labour gangs. Because of these higher and lower costs and returns in regard to these three crops, the net income per acre in these cases was only marginally higher on well-irrigated lands. We have, therefore, chosen to take the weighted averages of the per acre costs, outputs and net incomes of these as well as the other crops grown under canals and wells. This means that in using these net income data to compare the net incomes per unit of irrigation water used in different crops under canal irrigation, we are somewhat over stating the case for sugarcane in particular. This does not matter. Hopefully, improved management of canals, now being slowly started, would lead to this difference being wiped out. In any case, the other set of data relating to farm costs and returns over a number of years which we also propose to use for our exercise, does not permit us meaningful separation of canal and well irrigated crop lands, due to smallness of the samples. For all these reasons, the data in Tables 3.1 and 3.2 give the weighted average per acre costs, returns

and net income of a number of crops under irrigation in the sampled farms during 1978-79.

3.15 The data show that the net income per acre under irrigation is the highest for sugarcane. Indeed, it is more than 50 per cent higher than the next highest net income yielding crops, onion and lucern grass. It was 9 times that of irrigated Bajra, 5 times that of irrigated Rabi jowar and 4 times that of hybrid Kharif jowar; and so on. It is not surprising that given ample supply of irrigation water compared to this total land holding, a farmer in this region would prefer to grow sugarcane, except to the extent required by rotational requirements of good agronomic practice.

### **NET RETURNS BASED ON FARM COST ENQUIRIES**

3.16 The farm costs and return data presented above related to the PLBC and NLBC areas, for a particular year. Year to year variations in costs and returns are not unreasonable to expect, even under irrigated conditions, not only due to variations in weather, but also variations in frequency and quantum of water supply as well market conditions. The data collected by the field survey relating to a single year cannot help take care of this. Moreover, these data were collected by a quick survey of the sample farms. There

is possibility of errors arising out of inaccuracy in recollection by the respondents. Greater reliability can be ensured if daily accounts could be kept by the farmers or for him, for the entire agricultural year. But this would have proved very expensive and time consuming.

3.17 Fortunately, such data were (and are) available for the irrigated crops in the region for a number of years. Since 1973 the Union Ministry of Agriculture has been conducting with the help of Agricultural Universities and other institutions, a comprehensive scheme for collection of data on costs of cultivation of different crops in the country. For each crop, called the main crop, a systematic multistage sample is drawn for the region(s) of the State predominantly growing that crop. The information from the main sample, and, after a few years, of a sub-sample, is collected continuously for a certain number of years. For Maharashtra, we copied out, with the permission of the Economic and Statistical Adviser to the Ministry of Agriculture, detailed information relating to 3 main crop samples, sugarcane, jowar and bajra. Under the scheme the talukas in each district are selected where the particular crop is grown as main crop. From each taluka (cluster) five villages are selected and from each village two farms growing the crop as main crop are

selected, keeping in view different sizes of holdings. In addition two progressive farms are also selected from these villages. Thus, in each cluster twelve farms are selected for the particular crop. Detailed information from these farmers relating to land holding, land revenue, imputed rent on own land as well as rent paid for leased in land (plotwise), particulars of attached farm servants, material inputs and irrigation charges (cropwise) record of production (cropwise), running and maintenance expenses of farm machinery and implements is collected periodically. In addition, records of daily operations, plot wise for each crop are also kept by the cost-accounting method. Data on the above items are recorded not only for the main crops but also for the other crops grown by the selected farmers.

3.18 We obtained data for 5 districts, viz., Nashik, Ahmednagar, Pune, Satara and Solapur, for our purpose, for the sugarcane main sample, data are available for the years 1973-74, 1974-75, 1975-76, 1976-77 and 1977-78. For jowar main sample, data are available for 1973-74, 1974-75, 1975-76 and 1977-78, and for bajra main sample, data are available for only 1976-77. In all, data for 61 clusters were available and collected; as mentioned earlier, on the basis of 12 farmers per cluster, it works out to 723

farmers, for whom the data on the above-mentioned variables were available.

3.19 It may be mentioned here that so far as sugarcane, jowar and bajra are concerned, the input-output analysis is based only on the data from each of the respective main sample clusters; for instance, for sugarcane the data are processed only for sugarcane grown in the main sample sugarcane cluster and not for sugarcane grown in jowar and bajra clusters. Similarly, for jowar and bajra data are processed only from their main sample clusters. It is only in the case of other crops (other than sugarcane, jowar and bajra) that the data from all the main sample clusters are pooled together for the individual crops separately for further processing and analysis. Other than sugarcane, jowar and bajra, only those crops are considered which show a sizeable area under cultivation in the sample farms, and not all crops that are reported to be grown by the sample farmers.

3.20 Making use of the data of the sample farms mentioned above we have computed the amount of each of the physical inputs used and output realised per unit (acre) of land for different crops. Before we go into the results of the physical input coefficients of different crops estimated, it is necessary to take note of a few things.

3.21 First of all, scrutiny of the recorded data shows that size groupwise break-up of the input-output data, cropwise, leaves the sample size for each crop in each size-group so small, in terms of area under the crop, that estimating average input coefficient from such a small sample does not seem to be very meaningful. In those cases, however, where area under given crop was found to be substantial in each size-group, the estimates of input coefficients for different inputs did not show any marked variation from one size group to the other except for fertilizer in some cases. While estimating input coefficient, therefore, we have pooled the data for all the size-groups together. So the estimates of inputs coefficients are in the nature of averages for all farms, irrespective of size.

3.22 Secondly, the input-output data for each crop are recorded separately for that grown under well irrigation, canal irrigation and under dry condition. Again, if we considered the case of a crop grown on well and canal separately, the sample size (area under the crop) would be very small. Further, estimated input coefficients for a given crop grown on well and on canal did not show any marked variation from each other. In

view of this our estimated input coefficients are in the nature of averages for irrigated crops irrespective of source of irrigation.

3.23 Thirdly, the year to year variation in input coefficients is also not found to be significant, in other words, there is no marked variation from one, year to other in the use of basic inputs, like seed, human labour, farm yard manure, irrigation, etc. As per the annual Season and Crop Report of the State Government, the year 1973-74, 1974-75, 1975-76, 1976-77 and 1977-78, for which we have the data recorded for most of the major crops grown, have been more or less normal years in terms of rainfall and its distribution, except 1974-75, when the rainfall and its distribution was less than normal. But even for 1974-75, most of the basic inputs were not significantly different from those of other years. In view of this, the input estimates are not presented for each year separately, but only the average of the years. Since the PLBC command area, located in Ahmednagar district is the subject of study, the data from the cost of production survey in Ahmednagar district alone is used here. The estimated input coefficients are presented in Table 3.3.

3.24 An interesting aspect relating to the use of inputs, particularly fertilizers and insecticides, In different crops, as seen from these data, may be noted here.

It is seen that only in case of five crop - sugarcane, groundnut, cotton, onion and wheat - was there any significant application of fertilizers. There was little of it in case of all the other irrigated crops, not to mention the dry ones. Sugarcane recorded the highest amount per acre, but it was quite below the doses recommended by the extension agency. In case of the other four crops, it was even lesser. Similar was the picture in regard to farm yard manure. Insecticides/pesticides were reportedly used only on irrigated cotton fields, and to a lesser extent on wheat. In regard to all other crops, neither provision of irrigation nor use of improved seeds appeared to have led to any noticeable use of chemical fertilizers, insecticides, etc.

3.25 There was considerable variation in the rates of yield of most crops from year to year as well from farm to farm in the same year. This was largely due to differences in local soil, climate conditions and cultural practices besides the weather. Therefore, the average of yield rates over the years and sectors have been calculated and are given in Table 3.3. The



problems arising out of the variations noticed will be discussed in the next chapter.

3.26 The physical inputs and outputs, which are average of the observed figures for a number of years, are valued at 1978-79 prices, as in case of the special sample survey farmers, presented earlier. The problems arising out of the variations in the relative prices of various outputs as well as inputs will be taken up in the next chapter.

3.27 The gross value of output per acre includes the value of by-products as well as the main product. The costs (inputs) taken into account include costs of all materials used, whether purchased or home supplied, costs of bullock labour hired, purchased or farm supplied, the labour charges, both hired as well as the imputed value of family labour. Since the interest is in estimating the net income due to a unit of canal water, the costs due to machine hours and diesel oil used, essentially in irrigation from wells, presented in rows 8 to 9 of Table 3.3, are excluded in calculating the total cost given in row 10.

3.28 The comparative picture per acre of net return of various crops under irrigation, given in Table 3.4, is very similar to what was seen earlier under the sample survey of PLBC and NLBC farmers. Sugarcane, whether 'Adsali' (18-20 months) or 'Suru' (annual), gives the highest net income per acre under irrigation. The next highest irrigated crop, onion, gives only two-thirds of the income from 'Adsali' sugarcane, but was not far below the annual sugarcane. The irrigated cereals, like wheat (HYV), Hybrid Jowar and Hybrid Bajra gave less than one-third of the income of 'Adsali' sugarcane. But, this is not the proper way to compare the data. In the first place, 'Adsali' sugarcane stands for 18 to 20 months on the field before harvest, and 'Suru' for about 12 months. Most seasonal crops stand for about  $4\frac{1}{2}$  months, so that at least two seasonal crops can be grown in a year and more than 3 in 18-20 months on the same land. Moreover the requirements of water of these crops are quite different. Therefore, the proper way to compare these returns is to calculate the net return per unit of irrigation water from every crop.

**Table 3.3 per Acre Inputs and Outputs in Physical and in Value Terms for the Principal Crops  
(Ahmednagar District)**

		Name of the Crop							
		Cotton (HYV)	Groundn ut (HYV) Kh. Irri- gated	Groundn ut (HYV) Kh. Dry	Groundn ut (Lo- cal) Kh. Irri.	Groundn ut (Lo- cal) Kh. Dry	Maize (Irri- gated)	Onion (Irri- gated)	Lucern (Irri- gated) Fodder
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Area under the crop (Acres)		7.41	18.41	18.88	10.83	25.02	4.42	4.67	8.21
1) Seed	Q. (Kg)	2	35	28	40	39	10	4	11
	V. (Rs.)	40	175		160	171	25	180	25
2) F.Y.M.	Q. (Kg)	1000	500	200	500	450	2000	1500	1000
	V. (Rs.)	35	20	5	15	15	70	55	35
3) Fertiliser	Q. (Kg)	100	50	-	25	-	50	150	-
	V. (Rs.)	50	75	-	40	-	75	225	-
4) Pesticide	Q. (Kg)	-	-	-	-	-	-	-	-
	V. (Rs.)	100	-	-	-	-	-	75	-
5) Irrigation									
charges: (Canal)	V. (Rs.)	50	30	-	30	-	30	50	300
6) Human labour days	Q.	70	45	30	30	20	30	90	20
	V. (Rs.)	280	180	120	120	80	120	360	80
7) Animal labour days	Q.	8	8	6	8	6	10	8	4
	V. (Rs.)	96	95	70	95	70	120	95	48
8) Machine hours	Q.	134	22	-	24	-	25	100	38
	V. (Rs.)	94	20	-	18	-	19	100	21
9) Diesel Oil Ltrs.(Irrg)	Q.	150	80	-	70	-	-	100	-
	V. (Rs.)	375	200	-	175	-	-	250	-
10) Total cost									
Excl. Cls. 8 & 9	V. (Rs.)	751	650	3411	460	336	440	1040	488
11) Main Product	Q.	3.5	4.5	2.0	3.0	2.0	5.5	60.0	70.0
	V. (Rs.)	1400.0	1125.0	500.0	750.0	500.0	825.0	2100	1050.0
12) By-product (quintal)	Q.	-	6.0	2.5	4.0	2.0	6.0	-	-
	V. (Rs.)	-	50.0	30.0	50.0	25.0	50.0	-	-

(continued)

**Table 3.3. (continued)**

		Name of the Crop							
		Jowar (HYV) (irri.)	Jowar (Local) Irrigated	Jowar (Local) Dry	Bajra (Hy.) Kh. Irri.	Bajra (Local) (irri.)	Bajra (Local) (Dry)	Wheat (Hy.) (irri.) (Dry)	Wheat (Local) (irri.)
(1)		(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Area under crop (Acres)		16.83	57.53	162.90	17.62	18.90	59.23	180.66	85.90
1)	Q. (Kg)	3.0	4.0	4.0	2.5	2.0	2.5	37	35
	V. (Rs.)	35.0	8.0	8.0	25.0	4.0	5.0	88	77
2)	Q. (Kg)	1500	1000	100	1500	1200	200	1000	700
	V. (Rs.)	50	35	5	50	40	7	35	25
3)	Q. (Kg)	30	15	-	20	15	-	100	50
	V. (Rs.)	50	20	-	30	25	-	50	75
4)	Q. (Kg)	3	-	-	-	-	-	-	-
	V. (Rs.)	20	-	-	-	-	-	-	-
5)	V. (Rs.)	30	30	-	30	30	-	30	30
6)	Q.(days)	40	25	15	40	30	15	36	30
	V. (Rs.)	160	100	60	160	120	60	145	120
7)	Q.(days)	7	7	4	7	7	5	8	7
	V. (Rs.)	80	80	48	84	80	60	95	80
8)	Q.(Hrs.)	4	10	-	14	13	-	42	29
	V. (Rs.)	1	3	-	12	11	-	19	24
9)	Q.(Ltrs)	40	20	-	35	15	-	75	50
	V. (Rs.)	100	50	-	85	35	-	185	125
10)	V. (Rs.)	425	273	121	379	299	132	543	407
11)	Q.	8.0	4.0	1.5	6.0	4.0	2.0	6.5	4.0
	V. (Rs.)	840.0	500.0	187.0	750.0	500.0	250.0	975.0	600.0
12)	Q.	15.0	18.0	6.0	13.0	8.0	6.0	7.0	7.0
	V. (Rs.)	70.0	90.0	35.0	70.0	50.0	36.0	60.0	50.0

(continued)

Table 3.3. (continued)

		Name of the Crop						
		Wheat (Local)	Gram Irrigated	Gram Dry	Cotton (Hy.) Hot Weather	Groundnut (Hy.) Hot Weather	Sugarcane (Adsali)	Sugarcane (Suru)
(1)		(18)	(19)	(20)	(21)	(22)	(23)	(24)
Area under crop (Acres)		34.79	54.51	79.43			62.64	13.75
1)	Q. (Kg)	27	21	19	2	30	13,500	13,000
	V. (Rs.)	54	46	38	70	130	600	600
2)	Q. (Kg)	100	115	-	1500	1000	5000	4160
	V. (Rs.)	5	6	-	55	35	175	145
3)	Q. (Kg)	-	25	-	150	100	600	480
	V. (Rs.)	-	40	-	225	50	900	700
4)	Q. (Kg)	-	-	-	-	-	-	-
	V. (Rs.)	-	-	-	100	-	-	-
5)	V. (Rs.)	-	30	-	150	100	550	400
6)	Q.(days)	15	22	15	80	45	140	120
	V. (Rs.)	60	88	60	320	180	700	600
7)	Q.(days)	5	6	4	10	8	20	20
	V. (Rs.)	60	70	48	120	95	240	240
8)	Q.(Hrs.)	-	12	-	-	-	350	280
	V. (Rs.)	-	8	-	-	-	350	280
9)	Q.(Ltrs)	-	25	-	-	-	350	280
	V. (Rs.)	-	60	-	-	-	875	700
10)	V. (Rs.)	179	280	146	1040	690	3165	2705
11)	Q.	2.0	3.0	1.5	4.5	4.5	360.0	300.0
	V. (Rs.)	300.0	540.0	270.0	1800.0	1125.0	4680.0	3900.0
12)	Q.	3.0	3.0	1.0	-	6.0 0	-	-
	V. (Rs.)	20.0	30.0	10.0	-	50.0	-	-

NOTES: 1) Physical coefficients of inputs are based on averages for the year 1973-74 to 1975-76 in the case of jowar, for the year 1976-77 in the case of Bajra, for the year 1973-74 to 1977-78 in the case of Sugarcane and all other crops.

2) Irrigation charges shown in the computation of total cost per acre are for canal irrigation only. In the case of lift irrigation, instead of canal irrigation charges, cost of machine hours and either of diesel oil or of electricity need be considered assuming that the entire machine hours is for irrigation only.

**Table 3.4. Cost and Return per Acre of Principal Crops (Irrigated) from Cost of Production Survey**  
(Ahmednagar District)

Name of the Crop (all Irrigated)	Avg. cost of cultivation	Avg. Production per acre		Value of Production per acre		Total	Net Income (per acre) (7)-(2)
		Main product (Quintal)	By-product (Quintal)	Main product (Quintal)	By-product (Quintal)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sugarcane (Adsali)	3,165	360.0	-	4,680	-	4,680	1,515
Sugarcane (Suru)	2,705	300.0	-	3,900	-	3,900	1,195
Hybrid Jowar-Kharif	425	8.0	15	840	70	910	485
Jowar (local) Rabi	273	4.0	18	500	90	590	317
Bajra (HYV)	379	6.0	13	750	70	820	441
Bajra (local)	299	4.0	8	500	50	550	251
Wheat (HYV)	543	6.5	7	975	60	1,035	492
Wheat (local)	407	4.0	7	600	50	650	243
Groundnut	650	4.5	6	1,125	50	1,175	525
(HYV)-Kh.	460	3.0	4	750	50	800	340
Groundnut (local)	751	3.5	-	1,400	-	1,400	649
Kh.	280	3.0	3	540	30	570	290
Cotton (HYV)- Kha-	440	5.5	6	825	50	875	435
rif	488	10.0	-	1,050	-	1,050	562
Gram (local)	1,040	60.0	-	2,100	-	2,100	1,060
Maize (local)	1,040	4.5	-	1,800	-	1,800	760
Lucern (Fodder)	690	4.5	6	1,125	50	1,175	485
Onion							
Cotton (HYV) HW							
Groundnut (HYV)							
HW							

**Table 3.5. Irrigation Water Requirement of Crops at Distributary Head and the Net Value of Product Per Unit of Water Used (1978-79)**

	Name of the Crop	Water require- ment (acre inch)	Area that can be irrigated per Mcft. of water (acres)	Net profit per acre (Rs.)	Net Value of produce per Mcft. (Rs.)
	(1)	(2)	(3)	(4)	(5)
1.	Sugarcane (Adsali)	175	1.55	1,515	2,348
2.	Sugarcane (Suru)	136	2.00	1,195	2,390
3.	Bajra (HYV-Kharif)	20	13.80	441	6,086
4.	Bajra (local)	20	13.80	251	3,464
5.	Groundnut (HYV-Kharif)	24	11.50	525	6,038
6.	Groundnut (local-Kharif)	24	11.50	340	3,910
7.	Cotton (HYV-Kharif)	24	11.50	649	7,463
8.	Maize (local-Kharif)	20	13.80	435	6,003
9.	Hybrid Jowar (Kh.)	15	18.40	485	8,924
10.	Jowar (local-Rabi)	22	12.50	317	3,962
10a.	Jowar (Hy-Rabi)	22	12.50	485	6,063
11.	Wheat (HYV)	30	9.20	492	4,526
12.	Wheat (local)	30	9.20	243	2,235
13.	Onion (Rabi)	36	7.65	1,060	8,109
14.	Gram (local)	18	15.30	290	4,437
15.	Onion (Hot weather)	42	6.55	1,060	6,943
16.	Maize (Hot weather)	36	7.65	435	3,328
17.	Cotton L.S.(hot weather)	42	6.55	760	4,978
18.	Groundnut (Hot weather)	36	7.65	485	3,710

### NET RETURN PER UNIT OF IRRIGATION WATER

3.29 In order to calculate the net return per unit of water from different crops, we should have the data on total irrigation water requirement of different crops. For this purpose we propose to use our estimate of demand from different crops at the distributary head, presented in Table

2.10, after some adjustments made on the basis of other relevant data. These are given in Table 3.5. It is useful to use the estimated water requirements of different crops at the distributary head rather than at the field head in order to take account of the loss in transit. This is also how the irrigation department estimates irrigation requirements as well as allocation of water to crops in a season. This leaves the

possibility of improvement in the water distribution system that can further reduce the demand of various crops at the distributory head open. Now, given a discharge of one million cubic feet (Mcft) of water at the distributory head we calculate the area of a crop that can be irrigated with that quantity of water in the command area below the distributory. These can also given in Table 3.5. Given the area of a crop that can be irrigated, the net income generated by that area of the

crop is estimated by multiplying it with the net income per acre in Table 3.4. The last column of Table 3.5 gives this. A similar set of data, based on the per acre costs and returns of different irrigated crops, derived from the special survey in PLBC command, (Table 3.1) are also presented in Table 3.6. Since the two tables show similar results, we propose to use the information in Table 3.5 for discussion and further use.

**Table 3.6. Economics of Alternative Crops in Terms of Net Income per Unit (Mcft) of Water**

Crop	Per acre water requirements in acre inches	Area that can be irrigated per Mcft of water in acres	*Net value of produce per Mcft of water in Rs.
(1)	(2)	(3)	(4)
Sugarcane	175	1.60	2336
Hybrid jowar	15	18.40	6955
Bajra	20	13.80	2139
Groundnut (Kharif)	24	11.50	5980
Jowar	22	12.50	3650
Wheat	31	9.20	3606
Gram	18	15.30	2295
Cotton (Summer)	42	6.60	4059

\* Net income per acre of irrigated land taken from Table 5.1.

3.30 The net income per Hect of irrigation water, generated from different crops reverses the ranking of crops seen on a per acre basis earlier. Sugarcane turns out to be the crop that generates the lowest income per Mcft of water, at the given level of prices of the inputs and

outputs. All the cereals crops show a higher net income per Mcft of water; hybrid jowar in particular shows comparatively very high net income. Among the cash crops, cotton, onion and groundnut show very high incomes. All this happens because though the net

income generated per acre of the irrigated seasonal crops is lower than that from sugarcane, many more acres of the seasonal crops can be irrigated with an Mcft of water. It is clear that in situation like in the drought prone dry agricultural regions of Maharashtra, where irrigation water is potentially in short supply and where therefore the question of choice and crop or crops for irrigation arises, use of the water for sugarcane turns out to be economically least efficient.

3.31 the matter can be examined from a somewhat broader social angle as well. The calculations above have been in terms of the net income generated, per acre or acre-inch of water. The measure of net income used is relevant for the farmer in deciding the choice of crops for the use of scarce water. The matter can be looked at from the social point of view, where it would be useful to find out what addition to the gross national product can be the use of a given quantum of water make in agriculture of the region. The approximate gross national product or gross value added per acre of the different irrigated crops are arrived at by deducting the cost of all material inputs from the gross value of output. In our calculation in Table 3.3, the only item that will not be taken into account is the cost of human labour I both family and hired. The gross value added per acre of different irrigated crops is presented in Appendix Table

A.3.9. The picture is very similar to that relating to net income per acre. The gross value added per Mcft of water also shows a similar relative position as net income per acre inch of water. It is clear that under prevailing conditions use of irrigation water for sugarcane adds the least to social income. Most other crops are much better placed in that regard.

3.32 It was noted earlier (Chapter I) that cultivators in the past were reluctant to use water for irrigating seasonal crops, except in years of abnormally low rainfall. M. Vishweswaraya had mentioned that while irrigating a seasonal cereal crop gave greater yield, its cost was also higher, leaving no greater net income than what the unirrigated crop would give in a year of normal rainfall. This picture appears to have changed. The net incomes per acre of irrigated jowar and bajra are higher than that of unirrigated ones. What is more, the new hybrids give a distinctly higher net income. There is no reason to think that farmers would be reluctant to irrigate hybrid jowar or bajra crops even in a year of good rainfall in these drought prone regions. Newer varieties, stabler and higher yielding, are gradually being introduced; these and better extension would lead to greater use of plant nutrients leading to higher net incomes from these seasonal crops. The



developments are likely to further improve the efficiency of irrigation water in all such crops.

3.33 While most other irrigated crops give a higher net income compared to sugarcane, one cannot expect farmers to grow anyone of these crops exclusively. Normally, farmers follow certain crop rotations, depending on soil condition, agronomic requirements, labour supply position, besides market condition. A number of such crop rotations, as alternatives to (i) *Adsali* sugarcane, which stands on the field for 18-20 months (July to February) and (ii) *Suru* sugarcane which stands on the field for 12 months (November to November) are proposed in Table 3.7. These rotations have been finalised in consultation with and on the advice of the Professor of Agronomy at the Water and Land Management Institute at Aurangabad.

3.34 On the basis of these crop rotations, the total water requirement of the entire rotation can be estimated and the number of acres on which everyone of these rotations can be practised with one Mcft of irrigation can be worked out. This gives a basis for estimating the net income from everyone these crop rotations from one Mcft of water, which can then be compared with the net income

from the corresponding area under *Adsali* or *Suru* sugarcane, as the case may be. This is attempted in Table 3.8.

3.35 The exercises show that every alternative crop rotation generates greater total net income than sugarcane, in all cases more than two times that of sugarcane. Further, if any of the alternative crop rotations is followed on a single plot of land (on which the alternative is sugarcane), then the alternatives to *Adsali* sugarcane can irrigated 30 to 60 per cent more net sown area, and the alternatives to *Suru* 50 to 100 per cent more net sown area, depending upon the alternative crop rotation.

3.36 This point of view has acquired growing acceptance and support from informed irrigation engineers, scholars and knowledgeable public men. In the *Interim Report of the Committee* (set up by the Government of Maharashtra) to study the *Introduction of Eight monthly supply of water on the Irrigation projects in Maharashtra* this point of view has been very strongly advocated. In fact, this Committee for a comparatively smaller irrigation project on the same Pravara river (Mahaldevi Project) shows (Table 8 of the Report) difference among returns to per acre-inch of water from different crops, similar to those calculated here in this study. Indeed, in the serious water scarce regions, the Committee advocates

extensive irrigation, covering one-fourth of the total cultivated area of the cultivator in the Kharif season and another one-fourth in the Rabi season, thus covering 50 per cent of the command area with irrigation. Our crop rotations above are in the nature of intensive irrigated farming on the same piece of land, three crops being grown in the three seasons of the year. If this is relaxed and farmers are persuaded or permitted to take water of only a given amount, without any specification of crop rotation on a given piece

of land, a much wider area can be irrigated for at least one, possibly two crops during the year. This, of course, would not affect the net income generation, estimated earlier. We shall turn to these and other related questions in chapter V. But before that it is necessary to raise and answer some questions relating to the basis of our calculations in this chapter, and the farmers' attitudes in the matter, to which we now turn.

**Table 3.7. Alternative Crop Rotation to (i) Adsali and (ii) Suru Sugarcane**

	Kharif	Rabi	Summer
	Sugarcane (Adsali) (July plantation) Sugarcane	Sugarcane  Sugarcane (harvested by the end of February)	Sugarcane
	<b>Alternative to Adsali Cane</b>		
1st	Groundnut (HYV) (mid June- October end) Cotton (L.S.) -Sept. end)	Wheat (HYV) (Mid Nov.- February end) Hybrid Jowar Mid Oct.- Mid Feb.)	Cotton (L.S.) (Mid March)
2nd	Hybrid Jowar (Mid June-Sept. end) Bajra (HYV) (July-Oct.)	Wheat (HYV) (Nov.-end Feb.) Wheat (HYV) (Nov.-end Feb.)	Groundnut (HYV) (March-June) Mid Mid
3rd	Cotton (L.S.) (Mid June- Mid Nov.) Hybrid Jowar (July-Mid Oct.)	Gram (Nov. end Feb. end) Onion (Oct. end Dec. end)	Groundnut (HYV) (Mar. mid-June mid)
4th	Bajra (HYV) (Mid June-Mid Oct.) Cotton (L.S.) (Mid Oct.)	wheat (HYV) (Nov.-Feb.) Gram Nov. end - Feb. end)	Cotton (L.S.) (Mid March)
5th	Cotton (HYV) (Mid June-Mid Nov.) Hy. Bajra (July-Mid Oct.)	Wheat (HYV) (Nov. end Mid March) Onion (Oct. and - Jan. end)	Groundnut (HYV) (April-June mid)
6th	Groundnut (HYV) (Mid June- Sept. end) Bajra (HYV) (Mid June- Mid Sept.)	Wheat (HYV) (Nov.-end Feb.) Hy. Jowar (Oct.-Mid Jan.)	Onion (March-May end)

(continued)

**Table 3.7. (Contd.)**

Kharif	Rabi	Summer
Sugarcane	Sugarcane (Suru) (November- Plantation)	Sugarcane
	Sugarcane (harvested by the end of November)	
<b>Alternative to Suru Cane</b>		
1st	Hybrid Jowar (Beg. Oct.-Feb)	Groundnut (HYV) (Mar.-June) Mid Mid
Bajra (HYV) (July-Oct.)		
2nd	Wheat (HYV) (Nov.-Feb. end)	Groundnut (Mid-March- Mid June)
Hy. Jowar (July-Oct.)		
3rd	Wheat (HYV) (Nov.-end Feb.)	Groundnut (Mid-March- Mid May)
Cotton (HYV) (June-Nov.)		

**Table 3.8. Economic Alternative of Different Crop Combinations in Terms of Net Value of Produce Per Mcft of Water (1978-79).**

Crop Combination	Water requirement (Cubic feet)	area that can be irrigate per Mcft of water (acres)	Net Value of produce per Mcft of water (Rs.)
(1)	(2)	(3)	(4)
Sugarcane (Adsali) 1 1/2 Year Crop (July planting)	635,250	1.55	2,348
<b>Alternative Combinations to adsali cane</b>			
1st combination	428,340	2.35	5,316
2nd combination	475,530	2.10	5,030
3rd combination	468,270	2.15	6,383
4th combination	399,300	2.50	4,958
5th combination	529,980	1.89	5,910
6th combination	500,940	2.00	6,006
Sugarcane (Suru) One year crop (November planting)	500,940	2.00	2,390
<b>Alternative combinations to Suru cane</b>			
1st combination	283,140	3.55	5,009
2nd combination	294,030	3.40	4,971
3rd combination	320,700	3.06	4,976

## APPENDIX TABLES

**Table A.3.1. Average Size of Sample Households of which Working in Agriculture and Average Number of Permanent Farm Servants per Household in PLBC**

Size-group of operated holding (in acres)	No. of households	Average size of households	of which engaged in agriculture			Annual farm servants per household
			Male	Female	Children	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Upto 5.00	149	7.09	1.61	1.40	0.06	0.12
2. 5.01 to 10.00	116	8.14	1.74	1.47	0.02	0.51
3. 10.01 and above	103	9.47	2.14	1.63	0.08	1.16
TOTAL	368	8.08	1.80	1.49	0.05	0.53

**Table A.3.2. Average Size of Sample Households, of Which Working in Agriculture and Average Number of Permanent Farm Servants per Household in NLBC.**

Size-group of operated holding (in acres)	No. of households	Average size of households	of which engaged in agriculture			Annual farm servants per household
			Male	Female	Children	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Upto 5.0	67	6.43	1.64	1.75	0.07	0.06
2. 5.01 to 10.00	63	8.81	1.94	1.95	0.11	0.29
3. 10.01 and above	97	10.35	2.70	2.36	0.17	0.63
TOTAL	227	8.77	2.18	2.07	0.13	0.37

**Table A.3.3. Operated Area Irrigated Sourcewise, in the Sample Farms in PLBC**

(Area in acres)

Operational land holding size-group (acres)	No. of house- holds	Total Operated area	Irrigated		Un- irrigated	Average operated area
			Canal	Wells		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Upto 5.0	149	459.67	237.55	166.53	55.59	3.09
	(40.5)	(13.3)	(56.66)	(36.23)	(12.09)	
2. 5.01 to 10.00	116	887.54	302.26	436.84	148.44	7.65
	(31.5)	(25.8)	(34.06)	(49.22)	(16.52)	
3. 10.01 and above	103	2095.27	607.65	842.64	644.98	20.34
	(2.0)	(60.9)	(29.00)	(40.22)	(30.78)	
TOTAL	366	3442.46	1147.46	1446.01	849.01	9.35
	(100.0)	(100.0)	(33.33)	(42.00)	(24.67)	

NOTE: Figures in brackets are percentages to total, figures in brackets in cols. 4, 5, 6 are percentage to the total operated area in the row.

**Table A.3.4. Operated Area Irrigated Sourcewise, in the Sample Farms in NLBC**

(Area in acres)

Operational land holding size-group (acres)	No. of house- holds	Total Operated area	Irrigated		Un- irrigated	Average operated area
			Canal	Wells		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Upto 5.0	67	181.18	88.42	36.93	55.83	2.70
	(29.52)	(6.92)	(48.80)	(20.38)	(30.82)	
2. 5.01 to 10.00	63	492.45	146.75	111.22	234.48	7.82
	(27.95)	(18.82)	(29.80)	(22.59)	(47.61)	
3. 10.01 and above	97	1943.06	250.96	370.90	1321.20	20.03
	(42.73)	(74.26)	(12.92)	(19.09)	(67.99)	
TOTAL	227	2616.69	486.13	519.05	1611.59	11.53
	(100.0)	(100.0)	(18.58)	(19.64)	(61.58)	

NOTE: Figures in brackets are percentages to total, figures in brackets in cols. 4, 5, 6 are percentages to the total operated area in the row.

**Table A.3.5. Distribution of Gross Cropped Area of Sample Farms,  
Under PLBC, in 1978-79, According to Source of Irrigation**

(in acres)				
Season/Crop	Canal irrigated	Well irrigated	Un-irrigated	Total
(1)	(2)	(3)	(4)	(5)
1. Sugarcane	72.04*	451.84**	-	523.88
<b>Kharif</b>				
2. Bajra	156.78	98.08	127.33	382.19
3. Groundnut	46.28	33.51	-	79.19
4. Pulses	5.00	7.25	37.83	50.08
5. Others	1.00	2.63	17.75	21.38
6. Maize	2.75	11.88	-	14.63
7. Hy.Jowar	225.35	120.24	2.65	348.24
8. Vegetable	0.50	14.21	-	14.71
9. Cotton	-	4.50	-	4.50
10. Onion	-	-	-	-
11. Paddy	6.00	4.50	-	10.50
12. Lucern	8.43	74.59	-	83.02
13. Fodder	11.50	23.29	-	34.79
14. Chillies	-	1.63	-	1.63
<b>Rabi</b>				
15. Wheat	308.34	302.66	74.00	615.00
16. Gram	48.05	32.96	11.48	92.49
17. Jowar	498.18	224.96	479.40	1202.54
18. Onion	-	3.16	-	3.16
19. Chillies	-	0.25	-	0.25
20. Fodder	-	1.50	-	1.50
21. Vegetables	-	4.64	-	4.64
22. Fruits	3.95	3.78	-	7.73
<b>Summer</b>				
23. Cotton	11.75	204.42	-	216.17
24. Groundnut	8.75	13.25	1.00	23.00
25. Fodder	-	2.00	-	2.00
Total	1414.65	1641.73	681.44	3737.82

\* Besides this, there was an overlap of 60.34 acres of sugarcane from 1977-78. \*\* Besides this, the overlap from 1977-78 was 326.45 acres.

**Table A.3.6. Distribution of Gross Cropped Area of Sample Farms, Under NLBC, in 1978-79, According to Source of Irrigation**

(Area in acres)

Season/Crop	Canal irrigated	Well irrigated	Un-irrigated	Total
(1)	(2)	(3)	(4)	(5)
1. Sugarcane	6.71*	73.11**		79.82
Kharif				
2. Bajra	11.00	6.45	4.00	21.45
3. Groundnut	34.20	113.50	-	47.70
4. Pulses	8.25	2.58	310.55	321.38
5. Others	-	1.50	-	1.50
6. Maize	11.60	89.71	-	101.31
7. Hy.Jowar	10.00	18.13	1.25	29.38
8. Vegetable	0.25	13.38	-	13.63
9. Cotton	12.00	46.95	-	58.95
10. Onion	-	3.50	-	3.50
11. Paddy	1.50	7.26	-	8.76
12. Lucern	-	-	-	-
13. Fodder	1.50	19.94	-	21.44
14. Chillies	-	2.25	-	2.25
Rabi				
15. Wheat	20.45	105.13	-	125.58
16. Gram	6.75	16.13	5.00	27.88
17. Jowar	426.80	254.84	1120.64	1802.26
18. Onion	-	3.50	-	-
19. Chillies	-	-	-	-
20. Fodder	-	-	-	-
21. Vegetables	-	7.75	-	7.75
22. Fruits	-	5.13	-	5.13
Summer				
23. Cotton	43.35	51.25	-	94.60
24. Groundnut	68.50	11.00	-	29.50
25. Fodder	-	-	-	-
Total	662.86	752.99	1441.44	2857.29

\* Besides this, there was an overlap of 1977-78 area under sugarcane from 3.88 acres.

\*\* Besides this, the overlap of 1977-78 area under sugarcane, 52.41 acres.

**Table A.3.7. Cropping Pattern of the Sample Farmers on their Total Operated Holdings Pravara Left Bank Canal**

(Area in acres)

Size group of operational holding	rabi jowar	Wheat	Bajra	Sugar-cane	Hybrid jowar	Summer Cotton	Ground-nut	Lucern fodder	Pulses	Others	Gross cropped area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Upto 5 acres	154.10 (25.99)	142.60 (24.00)	30.01 (5.06)	63.38 (10.69)	83.54 (14.09)	42.24 (7.13)	27.01 (4.57)	23.94 (3.70)	14.29 (2.41)	13.37 (2.30)	594.48 (100.00)
2. above 5 acres and upto 10 acres	638.96 (30.25)	359.20 (17.01)	244.68 (11.59)	299.60 (14.19)	190.20 (9.01)	140.43 (6.65)	48.28 (2.29)	70.92 (3.34)	66.28 (3.14)	53.26 (2.55)	2111.81 (100.00)
3. Above 10 acres	409.48 (39.70)	113.20 (10.98)	107.50 (10.42)	160.90 (15.60)	74.50 (7.22)	33.50 (3.25)	27.50 (2.67)	26.45 (2.47)	62.00 (6.01)	16.50 (1.70)	1031.53 (100.00)
	1202.54 (32.19)	615.00 (16.46)	382.19 (10.23)	523.88 (14.02)	348.24 (9.82)	216.17 (5.79)	102.79 (2.75)	121.31 (3.15)	142.57 (3.82)	83.13 (2.25)	3737.82 (100.00)

Note: Figures in the parentheses indicates percentages to gross cropped area.

**Table A.3.8. Cropping Pattern of the Sample Farmers on their Total Operated Holdings Neera Left Bank (Non-Perennial Zone)**

(Area in Acres)

Size group of operational holding	Sugar-cane	Pulses	Maize	Vegetables	Wheat	rabi jowar	Cotton (mainly hot weather)	Ground-nut (mainly hot weather)	Others	Total Gross cropped area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Upto 5.00 acres	0.75 (0.35)	3.50 (1.66)	7.75 (3.67)	1.25 (0.59)	5.20 (2.46)	154.38 (73.05)	15.00 (7.10)	19.50 (9.23)	4.00 (1.89)	211.33 (100.00)
2. Above 5.00 acres and upto 10.00 acres	15.23 (2.72)	32.05 (5.73)	21.56 (3.86)	3.38 (0.60)	37.89 (6.78)	354.03 (63.31)	44.25 (7.91)	28.00 (5.01)	22.84 (4.08)	559.23 (100.00)
3. Above 10 acres	63.84 (3.06)	285.83 (13.70)	72.00 (3.45)	26.00 (1.25)	82.49 (3.95)	1293.87 (62.00)	94.30 (4.52)	79.70 (3.82)	88.70 (4.25)	2086.73 (100.00)
All sizes	79.82 (2.79)	321.38 (11.25)	101.31 (3.55)	30.63 (1.07)	125.58 (4.40)	1802.28 (63.08)	153.55 (5.37)	127.20 (4.45)	115.54 (4.04)	2857.29 (100.00)

Note: Figures in the parentheses indicate percentages to total gross cropped area.



**Table A.3.9. Gross Value Added by Different Crops per Mcft of Irrigation Water**

Crops		Gross Value Added per acre (Rs.)	No.of acres irrig- able with Mcft (acres)	Total Gross Value Added (2 x 3) (Rs.)
(1)		(2)	(3)	(4)
<b>Irrigated Crops</b>				
1.	Sugarcane (Adsali)	2,215	1.55	3,433
2.	Sugarcane (Suru)	1,795	2.00	3,590
3.	Cotton	929	11.50	10,683
4.	Groundnut (HYV-Kh)	705	11.50	8,108
5.	Groundnut - HYV Sum.	665	7.65	5,087
6.	Cotton - HYV-Summer	1,080	6.55	7,074
8.	Maize Kharif	555	13.80	7,659
9.	Onion Summer	1,420	7.65	10,863
10.	Jowar Hybrid	645	18.40	11,868
11.	Jowar - Local Rabi	417	12.50	5,212
12.	Bajra - Hybrid	601	13.80	8,294
13.	Bajra Local	371	13.80	5,120
14.	Wheat - HYV	637	9.20	5,860
15.	Wheat Local	363	9.20	3,340
16.	Gram	378	15.30	5,783
<b>Unirrigated</b>				
18.	Groundnut - HYV Kh.	309	-	-
19.	Groundnut - Local	269	-	-
20.	Jowar - Local	161	-	-
21.	Bajra - Local	214	-	-
22.	Wheat - Local	201	-	-
23.	Gram	194	-	-

#### **CHAPTER IV** **Returns to Irrigation Water** **under Uncertainties**

4.1 In the preceding chapter, the superiority of different combinations of seasonal crops over a sugarcane based irrigation system, in terms of net returns per unit of water, was established. Despite this, most farmers, given an opportunity, appear to go in for sugarcane in preference to seasonal crops under irrigation water: if the state is willing to supply unlimited water to farmers for growing sugarcane in specified areas, the farmers have no reason to refuse. But there are other considerations besides this. During the field survey, discussion with many farmers brought out their acceptance of the greater returns from irrigated seasonal crops than from sugarcane, for a given quantity of water. But they mentioned a number of other reasons that, in their opinion, make the farmers prefer sugarcane to seasonal crops. These may be summarised below:

- (i) The minimum price of sugarcane is not only fixed (by government), but it is more than supported by the co-operative sugar factories. As against this, the prices of seasonal crops fluctuate highly from year to year and there is no effective check on this in the market.

- (ii) Sugarcane is largely free from pests and diseases, and fluctuations in weather have the minimal impact on yield of sugarcane. On the other hand, the seasonal crops are subject to many diseases and pests and, even when irrigated, are affected by changes in temperature and rainfall.
- (iii) Canal irrigation is not very regular and reliable despite the formal rules laid down by the irrigation department. Sugarcane can stand the stress arising out of this; most seasonal crops cannot, and therefore suffer in yield. Hence the preference for sugarcane.
- (iv) Seasonal crops demand labour at different times, the operations are fixed and time specific and, therefore, cannot be postponed. Sugarcane is just the opposite, with the requirement of labour after planting being essentially for irrigation and application of fertilizers which can stand postponement to a greater extent. And, finally, sugarcane does not demand as much of routine attention and care from the farmer as the seasonal crops do.

These various considerations can be sought to be examined in what follows.

#### **FLUCTUATION IN PRICES**

4.2 In the exercises in Chapter III, the

prices of outputs and inputs used were those for the year 1978-9, prevailing in the PLBC area. However, it is necessary to examine how the relative prices have behaved over the years, in order to be reasonably assured that these prices are not of an exceptional type. For this purpose, the relative prices of a number of relevant crops were examined for a period of 16 years preceding 1978-79. Monthly average price data were collected from the *statistical Abstract of Maharashtra state*, published by the Directorate of Economics and Statistics of the Government of Maharashtra, for 16 years, beginning 1960, for some selected primary market centres in the drought prone region, viz., Ahmednagar, Srirampur, Pune, Barsi. The annual average prices were calculated as simple averages of the relevant monthly prices. The annual average price of every other commodity in a year was expressed as a percentage of that year's price of Bajra, which was used as the base crop for the purpose. The years or centres for which Bajra prices were not available systematically, the price of Jowar was used as the base price. The relative prices of different crops, calculated in this manner, for years 1960 to 1976, for the four market centres, are given in Appendix Tables A.4.1 to A.4.4.

4.3 A perusal of the relative prices shows that except for groundnut and pulses, the relative prices of other crops show no particular trend, though, of course, there are fluctuations from year to year.

4.4 Similarly, independent studies<sup>[1]</sup> show that the relative value of wage rates in agriculture in Maharashtra, that is the money wage rates deflated by the prices of farm products entering into the consumption of the labourers, show no upward or downward trend over long years. On the other hand, the relative prices of the two other major inputs, fertilizers and diesel oil, had shown a rising trend after 1913.

4.5 It is useful to ask the question how low can the relative price of any of the seasonal crops - relative to sugarcane - can go before the net income per Mcft, of water from that crop becomes lower than that of sugarcane? In order to estimate this limit, we have tried to estimate the gross value of output, per Mcft, of water, from everyone of the seasonal crops which will give the same level of net income as annual (Suru) sugarcane. Compared to the observed gross value for the year 1978-19, it indicates upto what extent, given the observed yield rate and the costs of inputs, the price of the seasonal crops can go down before sugarcane becomes more economical. Alternatively, the same percentage can be

interpreted as the extent to which the per acre physical yield of the seasonal crops can go down, given the prices and costs of all crops (at 1978-79 level) before sugarcane becomes more economical in the use of irrigation water. The figures below indicate these percentages for various crops:

1.	Jowar Hybrid-Kharif	48%
2.	Bajra Hybrid-Kharif	36%
3.	Onion - Rabi and Summer	33.3%
4.	Cotton - HYV-Summer	33.3%
5.	Cotton - HYV-Kharif	32%
6.	Groundnut - HYV-Kharif	28%
7.	Maize - Kharif & Summer	26%
8.	Jowar - Local-Rabi	26%
9.	Wheat - HYV	24%
10.	Gram - Local	24%
11.	Bajra - Local	16%
12.	Groundnut Summer	16%
13.	Groundnut - Local-Kharif	16%

4.6 The above table shows that the price of most crops had to fall by 25 per cent relative to the price of sugarcane, and in case of crops like cotton, onion and hybrid bajra by one-third and in case of hybrid jowar in the kharif season by nearly half, compared to the price of annual (Suru) sugarcane before these crops would yield a lower net income per Mcft. of water let out at the distributory head, than sugarcane. Comparison with *Adsali* sugarcane would make these percentages somewhat higher.

4.7 In point of fact, in most of the years since 1960-61, and particularly since 1968-69, the prices of the first 10 crops listed above compared to sugarcane, had not fallen lower than the percentages indicated. Only the price of wheat compared to sugarcane had fallen by about 32 per cent in 20 per cent of the years and the price of jowar by nearly 50 per cent for nearly one-third of the time. One important reason for the price of jowar having remained low compared to the price of sugarcane or bajra for some years, was the policy of monopoly procurement of jowar by the State Government. Since this was given up, the relative price has not gone down to the extent estimated.

4.8 All this goes to suggest that even with very considerable lowering of the relative prices of the irrigated seasonal crops, these crops continue to show greater return per Mcft. of irrigation water than sugarcane. The cultivator's fears do not appear to be borne out, except the fact that fluctuations in the prices of these crops results in fluctuation in net income from these irrigated crops, while this is less so in the case of sugarcane. This may give rise to the feeling of the farmers noted in the beginning of this chapter.

4.9 Another factor responsible for this feeling is the variation in the prices of seasonal crops within a year. This variation, while not uniform from year to year, is sometimes quite high. This can cause genuine feeling of loss to the grower of seasonal crop(s) compared to sugarcane, which exhibits no such post-harvest price fluctuations. One important policy measure to reduce such fluctuations is the formulation and implementation of a minimum support price for the seasonal crops. While the Agricultural Price Commission (now called the Commission on Agricultural Costs and Prices) has been recommending and the Government announcing support prices for most of these crops, for more than two decades now, there is often no purchasing agency available at the primary market level to purchase at the announced support price, in most parts of the country excepting the wheat-rice belt in northern and north-western India, and a few pockets elsewhere. For millets (jowar and bajra) and gram and oilseeds there is no such effective agency in the field; for onions, NAFED has been carrying out this operation irregularly. Cotton is now under monopoly state marketing in Maharashtra. A proper mechanism to enforce support prices would go a long way in erasing this uncertainty relating to price of seasonal crops from the minds of the farmers.

4.10 A related exercise in the context of changing relative prices has also been carried out by using the prices prevailing in the year 1981-82. During this year the price of sugarcane doubled (from Rs. 130 a tonne to Rs. 260), while that of the seasonal crops went up to a much smaller extent; local jowar and bajra Rs. 180 (Rs. 125); hybrid jowar Rs. 140 (Rs. 105); wheat Rs. 220 (Rs. 150); groundnut Rs. 350 (Rs. 250); maize Rs. 180 (Rs. 150); gram Rs. 200 (Rs. 180); onion Rs. 60 (Rs. 35); cotton Rs. 500 (Rs. 400). Similarly prices of many inputs also rose the net income per Mcft. of irrigation water separately for all these crops, by using the 1981-82 prices, but the same physical inputs and outputs as before, are given in Table 4.1. Table 4.2 gives the income from the different crops rotations mentioned in Chapter III.

4.11 The data show that despite a very high increase in the relative price of sugarcane - more than 50 per cent compared to other crops - the other crops, that is, all high yielding varieties and hybrids as well as onion, show a higher net income per Mcft. of water than sugarcane. Therefore, some crop rotations with these crops in particular, are still seen to be comparable to sugarcane.

## FLUCTUATION IN YIELD

4.12 Fluctuations in yields of seasonal crops even under irrigation can be another source of lower returns and uncertainty in that context. However, the table in paragraph 4.5 above can also be interpreted to mean the extent to which the yields of the listed crops can fall below the levels indicated for 1978-79 in this study, without any change in prices and quantities of inputs and prices of all outputs, before sugarcane becomes the higher net income generating crop.

4.13 The observed fluctuations in the average yield rate of seasonal crops from year to year are quite significant, so is the variation in the yield rates of different farmers growing the crop in any particular year. (The detailed coefficients of variation calculated are not presented here.) As far as the year to year variations are concerned, the data in paragraph 4.5 indicates that in most situations crops and crop combinations including the first 4 crops, will prove superior to sugarcane most of the time.

**Table 4.1. Net Income per Acre and Per Mcft. of Irrigation Water, from Different Crops, at 1981-82 Prices**

	Name of the Crop	Net Income per acre (Rs.)	Net Income per Mcft of water (Rs.)
1.	Sugarcane (Adsali)	5,765	8,936
2.	Sugarcane (Suru)	4,735	9,740
3.	Bajra (HYV)	736	10,157
4.	Bajra (Local)	451	6,224
5.	Groundnut (HYV-Kharif)	927	10,660
6.	Groundnut (Local-Kharif)	610	7,015
7.	Cotton (HYV-Kharif)	904	10,396
8.	Maize (Local-Kharif)	567	7,825
9.	Hybrid Jowar (Kharif)	732	13,469
10.	Jowar (Local-Rabi)	517	6,463
10a.	Jowar (HY. - Rabi)	732	9,150
11.	Wheat (HYV)	896	8,243
12.	Wheat (Local)	518	4,766
13.	Onion (Rabi)	1,207	9,234
14.	Gram (Local)	344	5,263
15.	Onion (Hot weather)	1,207	7,906
16.	Cotton (L.S. Hot weather)	1,093	7,159
17.	Groundnut (Hot weather)	875	6,694
18.	Maize (Hot weather)	567	4,338

**Table 4.2. Economic Alternatives of Different Crop Combinations in Terms of Net Income per Mcft. of Water, at 1981-82 Prices**

Crop Combinations	Water requirement (Cubic feet)	Area that can be irri- gated per Mcft of water (acres)	Net income per Mcft of water (Rs.)
Sugarcane (Adsali - one and half year crop - July planting)	6,35,250	1.55	8,936
Alternative Crop-mix to 'adsali' cane 1st combination	4,28,340	2.35	8,573
2nd combination	4,75,530	2.10	8,684
3rd combination	4,68,270	2.15	8,733
4th combination	3,99,300	2.50	7,673
5th combination	5,29,980	1.89	8,728
6th combination	5,00,940	2.00	8,996
Sugarcane (Suru One year crop - Novem- ber planting)	5,00,940	2.00	9,470
Alternative crop combination to 'Suru' cane. 1st combination	2,83,140	3.55	8,318
2nd combination	2,94,030	3.40	8,500
3rd combination	3,26,700	3.06	8,186

4.14 It is useful to remember that low yield rates and low relative prices of all crops compared to sugarcane do not occur to the same or stated extent, in a particular year. While for exercise here such an assumption has been made, in actuality it would be different and therefore the greater economic justifiability of these crops and crop-combinations *vis-à-vis* sugarcane will be strengthened.

#### **REGULARITY AND FREQUENCY OF IRRIGATION**

4.15 Another factor that is said to inhibit irrigation of seasonal crops under

canal is the lesser frequency of irrigation available, and, therefore, the greater interval between irrigations and above all the uncertainty associated with it. Our survey into well as well as canal irrigation in the command area of PLBC and NLBC shows that for the same crop in the same season there were, by and large, more irrigations given from wells and at shorter intervals. (Ref. Tables A.4.5 and A.4.6 in the Appendix.) The patterns of cropping under canal and well irrigation, given in Chapter II, show clearly that the farmers grew a wider variety of seasonal crops under well irrigation than under canal.

4.16 The quantum of irrigation water and the interval between two depend upon the nature of the soil, the root structure of the plant, the stage of growth of the plant and the rate of evapotranspiration. Given the structure of the soil, the shallower rooted plants would require replenishment of moisture around the root zone at more frequent intervals. In a canal system, serving different types of crops in the same season under the same distributory/water, course, the rotations can be only a common rotation, not necessarily designed to suit every individual crop separately. In the system in the Deccan, the intervals are worked out, in different seasons, in a manner that will suit a crop like sugarcane, which can stand water stress, without much adverse effect, for longer periods. This naturally discourages farmers from growing a wide variety of seasonal crops under canal irrigation, and sometimes affect adversely those crops that are usually grown. Given the demonstrated superiority of seasonal crops over sugarcane in the economic use of water, farmers can be encouraged to adopt these alternatives, if supply of water can be ensured at reasonable intervals.

4.17 Experimental work by agronomists and irrigation engineers working in the Command Area Development Authorities in the State of Maharashtra

have resulted in different recommendations. One suggestion is to provide water more frequently but in smaller doses, to the fields, through the canal system. This, it is said can be done by examining continuously the rate of evaporation through Evaporation Pans at suitable locations in the command area. Since different crops need different quantities of water, for a given evaporation rate, a weighted average can be worked out depending upon the crop pattern in the command area at the time, and their stages of growth. Once the water is found to have gone below a certain specified level, irrigation should be provided. This irrigation should be in the smallest possible dose, say 35 to 40 mm. The frequency will vary with the rate of loss of soil moisture, but it is sure to be more frequent than what is practised. Frequent irrigation has also the advantage of cycling irrigation to specific distributory, minors and outlets; larger intervals result in simultaneous demand all round, resulting in greater costs and losses to the canal system. In black cotton soils, the appropriate intervals appear to be 14 days in Rabi and 7 days in the Hot Weather.<sup>[2]</sup>

4.18 Another suggestion[3] for scheduling irrigations in vertisols, which are subject to water logging is the opposite of the earlier one. This advocates deficit irrigation for crops, at somewhat larger



intervals, say 21 days in the Rabi season, so that the crop develops some water stress, while at the same time the actual evapotranspiration is less than under full irrigation. While this may affect yield per acre somewhat, the total production from the given quantum of irrigation water in the system will be higher since the quantum of water saved can be used to irrigate wider areas. While this has some justification, the stress in summer may require a lesser interval than 21 days; similarly taking a deep rooted crop like sugarcane out of the irrigation system may lower the interval by increasing the stress factor.

4.19 One essential point in both these experiments is the necessity of ensuring supply of a given quantum of water to a crop on the field at the time of irrigation. Unfortunately, the existing canal system in the Deccan has no mechanism for ensuring this. As noted earlier, under present practice, there is no control over the volume of water supplied to a field: only when one farmer says he had had enough, does the next man get this turn. Fortunately, control over volumetric supply of water to a field can be established through the *warabandi* method, common in canal systems in the North, and now modified into the Rotational Water Supply System (RWS) in Maharashtra.<sup>[4]</sup>

4.20 The essence of RWS is to ensure stated volumes of water per rotation to the fields of every cultivator by ensuring a specified volume of flow at the outlet of the water course and fixing the time for which the cultivator can divert the water from the water course to his field. Most outlets to water courses, from the distributory or minor, are supposed to be designed to discharge one cusec of water. Given the area and the crop to be irrigated and the requirement of water per irrigation for that crop, the total volume of water and therefore the time period for which the water in the water course can be diverted by the cultivator to his field can be calculated. The RWS in Maharashtra was further designed to supply water in smaller doses, about 2 acre inches at a time in two successive doses in two consecutive weeks, leaving the third week as a gap - the cycle starting again from the fourth week. The irrigation should begin with the tail-end water course and also from the tail end farmer along the water course. Given these requirements the turn and time for each irrigator can be worked out before the rotation, in a meeting of the officials and the irrigators. This method ensures timely supply of a specified volume of water to every field.

4.21 while this method, first tried out in some sections of a couple of projects, is being gradually extended, the real difficulty appears to be the defective design of many outlets, which despite the stipulation, do not in fact record one cusec discharge but much less. This involves remodelling the outlets in most cases - a time - consuming process, delaying the introduction of RWS. Of course, pending such redesigning, the time period for every farmer for irrigating from the water course can be worked out on the basis of the actual discharge at the outlet. But this requires that the actual discharge at every outlet must first be measured, and it must be ensured that there are no other defects that can upset this arrangement. For, if the trust of the irrigator in the capacity of the channel to deliver the stated quantity of water in the specified period is upset, the entire arrangement is sure to break down. Therefore, in the interest of more economic use of water, it appears urgently necessary to undertake these tasks in the existing irrigation projects and ensure the compliance of actual construction to these required norms in the new projects.

4.22 The calculation about the delivery of a stated volume of water to the field, given a stated discharge at the outlet head,

also depends upon negligible loss of water in transit in the water course. This requires that the length of the water course, and therefore the command area of a water course, should be reasonably small. The norm set out by irrigation engineers for the purpose is about 8 ha., (i.e., 20 acres). However, many water courses have, in fact, much larger command areas, offer more than 40 ha., (i.e., 100 acres), and are consequently much longer. It is necessary to ensure a shorter length and smaller command area in the new projects. In the existing ones, redesigning, whenever possible, will be useful. Otherwise, it would be necessary to line the water courses in order to eliminate loss of water in transit, so that the stipulated volume of water to the field can be supplied under the RWS. If a case for lining of canals is to be made, it appears it must start from the water course, for the reason mentioned here.

4.23 Other experimental works have been carried out to see if there can be greater economy in the application of water in the field by having different designs of layout of the field, and strips and furrows for cropping.<sup>[5]</sup> If these and any other methods turn out to be effective

and can be reasonably adopted by farmers, the field water requirements of different crops can be further reduced, thereby increasing the irrigable area under the canal system. The more water economising methods of irrigation, like sprinkler and drip, now being advocated under the well/tube well systems - drip mainly for orchards and certain plantation crops - will require considerable redesign in the canal irrigation system and use of power, and are, therefore, not immediate prospects. Pending all these, the introduction of the RWS appears urgently necessary to ensure timely and controlled volume of water supply, not only to prevent loss of water on the field, but to take out a major source of uncertainty faced by the irrigators in irrigating seasonal crops.

### LABOUR CONSTRAINTS

4.24 The labour problem involved in the alternative crop patterns to sugarcane centred irrigation can be looked at from two points of view. Firstly, will the demand for total labour, self-employed plus wage labour, be greater or less under

the alternative croppings than sugarcane? Secondly, is there a possibility of seasonal constraints in supply compared to demand under alternative cropping systems? The first question may be taken up first for examination.

4.25 The following Table 4.3 gives the total number of labour days that would be required to grow different crops with one Mcft. of irrigation water. The data on average per acre labour days required are taken from the cost of production enquiries conducted by the Union Ministry of Agriculture. It is quite clear that except for hot weather maize, every alternative crop to sugarcane generates more labour days of employment, with the help of one Mcft. of water than sugarcane. Any of the crop rotation-s/combinations, mentioned in Chapter III, would also generate greater demand for labour. In an economy where rural underemployment is widespread and chronic, leading to high incidence of poverty, a cropping system under irrigation giving rise to greater employment opportunity should be a most desirable proposition.

**Table 4.3. Total Number of Labour Days Required by the Individual Crops that can be Irrigated With one Mcft. of Water**

	Crop	Labour days per acre	No. of acres per Mcft. of water	Total labour days (2 x 3)
	(1)	(2)	(3)	(4)
1.	Sugarcane (Adsali)	140	1.55	217
2.	Sugarcane (Suru)	120	2.00	240
3.	Bajra (Hy.-Kh.)	40	13.80	552
4.	Groundnut (BYV-Kh)	45	11.50	518
5.	Groundnut (L-Kh)	30	11.50	345
6.	Cotton (8YV-Kh)	70	11.50	805
7.	Maize (L-Kh)	30	13.80	414
8.	Jowar (By-Kh)	40	18.40	736
9.	Jowar (L-R)	25	12.50	313
10.	Wheat (BYV-R)	36	9.20	331
11.	Wheat (L-R)	30	9.20	276
12.	Onion (R)	90	7.65	689
13.	Gram (L)	22	15.30	337
14.	Onion (HW)	90	6.55	590
15.	Maize (HW)	30	7.65	230
16.	Cotton (HYV-HW)	80	6.55	524
17.	Groundnut (HW)	45	7.65	344

Kh. = Kharif; R = Rabi; HW = Hot Weather; Hy = Hybrid; HYV = High yielding variety; L = Local variety.

4.26 Would the alternative cropping patterns generate constraints of labour supply in seasons of peak labour demand? Surely, seasonal demand for labour would be higher under the alternative cropping patterns than sugarcane. But two things have to be remembered in this context. First, as noted earlier (Chapter III), substitution of the alternative cropping patterns to sugarcane, in which there is a separate crop on the irrigated land in the three seasons of the year, will lead to increase in net irrigated area by 30 to 60 per cent. If cultivators grow only two irrigated crops a year on any irrigated plot of land, then the net irrigated area would easily double. This will mean not only the bringing of the presently unirrigated lands in the irrigated villages under irrigation but extent irrigation to other lands that are currently deprived of it. The greater irrigated area and therefore greater labour demand would be spread over wider areas the consequent coverage of larger number of households, as farmers and wage labourers, would obviate the problem of shortage of labour at seasons of peak demand. Moreover, labour today seasonally migrates from unirrigated vil-

lages in the neighbourhood and more distantly located, to the sugarcane growing areas. There is nothing to prevent this from happening in these drought prone regions, where nearly half the cultivated land is, in any event, going to remain unirrigated. If labour migrates seasonally to the irrigated rice and wheat fields of the Punjab from long distances, there is no reason to doubt this from happening in Maharashtra, without cross country movements. Indeed, dispersal of migrant labour over wider irrigated area may be more desirable than the concerted demand that sugarcane makes. In any case, there need be no fear of labour shortage at peak seasons.

4.27 The analysis of the problems arising out of fluctuations in prices and yields and uncertainty of water supply shows that despite these uncertainties the alternatives to sugarcane under canal irrigation yield better returns, and improvement through price support policy and improvements in the design of water courses and distribution system will further improve the situation. Not only will greater area, and, therefore, larger number of farmers receive irrigation, but also it will generate greater total employment than sugarcane based irrigation. This, however, raises the

question of the status of sugarcane in these drought prone regions of Maharashtra, which accounts for a substantial portion of sugar production in the country. This question will be examined in the next chapter.

#### NOTES

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2. This is worked out and reported by S.N. Lele and A.V. Chandorkar in *Scheduling of Irrigation by Variable Frequency and Doses of Supply*, in *National Workshop in Scheduling of Irrigation*, Nov. 12-13, 1983, WALMI, Publ. No. 5, pp. 98-115.

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4. *Rotational Water Supply in Girna Canal Sgstem*, Joint Study by Project Formulation Cell, Planning Department, and Command Area Development Authority of Irrigation Department, Bombay, Government of Maharashtra, 1979.

5. Kairnar, B.G., *Water Management by Border Strip Method - a Working Paper*, Jalgaon, Command Area Development Authority, Girna and Upper Tapi Projects, December, 1980.

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## APPENDIX TABLES

Table A.4.1. Relative Prices of Principal Crops in Ahmednagar Market (Base Crop: Bajra = 100)

Crops	1960- 61	1961-62	1962-63	1963-64	1964-65	19,65-66	1966-67	1967-68	1968-69
1. Wheat	124.44	118.15	128.18	135.67	148.55	112.80	123.62	153.93	138.92
2. Jowar	90.15	78.11	91.38	86.74	77.07	50.87	63.78	65.19	64.67
3. Gram	93.43	99.12	98.73	115.20	132.72	129.68	177.75	214.90	103.29
4. Tur	-	82.04	102.69	141.92	116.76	83.79	110.04	158.16	106.49
5. Mung	120.25	113.00	-	-	-	-	145.66	162.98	135.93
6. Groundnut	147.25	153.21	137.16	154.39	119.45	113.22	187.79	160.27	136.83
7. Sesamun	275.34	272.43	229.43	222.99	-	-	-	-	-
8. Safflower	129.82	114.78	127.29	127.32	102.57	86.05	146.98	114.39	101.10
9. Gur	-	83.81	124.58	198.36	118.75	55.11	91.59	210.67	185.63
10. Cotton	280.01	285.50	304.98	345.87	195.59	170.77	299.60	206.45	131.74
11. Sugarcane	-	-	-	-	8.52	6.08	7.44	20.17	13.47
12. Potato	-	-	-	-	-	-	-	-	-

(Continued)

**A.4.1. (Continued)**  
**(BASE CROP: BAJRA = 100)**

Crops	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
1. Wheat	127.60	134.53	141.79	101.20	126.14	120.16	125.90	138.77
2. Jowar	64.35,	68.42	76.11	50.11	41.83	100.15	112.50	128.08
3. Gram	102.78	128.93	134.21	118.86	131.70	142.09	124.56	117.84
4. Tur	105.96	139.84	160.03	129.13	119.32	117.25	103.80	142.60
5. Mung	135.25	134.54	159.69	196.48	-	128.26	205.08	-
6. Groundnut	136.14	199.99	191.63	152.87	166.12	170.51	135.61	217.77
7. Sesamun							-	-
8. Safflower	100.00	179.12	153.47	121.70	126.14	144.85	105.08	190.20
9. Gur	184.70	91.46	170.90	142.43	107.84	99.99	117.19	169.50
10. Cotton	131.08	318.04	340.53	108.46	-	-	-	-
11. Sugarcane	10.01	11.47	18.08	12.80	10.03	8.97	9.44	10.70
12. Potato	-	-	-	-	-	-	-	-

**Table A.4.2. Relative Prices of Principal Crops in Barsi Market  
(Base Crop: Jowar = 100)**

Crops	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69
1. Wheat	127.99	139.83	118.88	134.18 2	17.65	217.65	194.76	228.56	205.56
3. Jowar	-	-	-	-	-	-	-	-	-
4. Gram	-	-	88.90	110.73 1	60.48	249.84	267.13	317.44	144.91
5. Tur	100.99	98.72	104.20	150.29 1	70.24	158.43	160.04	225.93	157.09
6. Mung	118.41	124.77	-	- -	-	-	-	-	216.20
7. Groundnut	157.54	179.00	130.06	167.90 1	80.46	209.16	287.81	219.76	215.13
9. Safflower	131.92	129.55	118.00	118.87 1	41.60	167.98	226.39	161.51	155.41
11. Cotton	209.02	236.90	195.62	-	-	-	-	-	-

Crops	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
1. Wheat	198.30	195.06	177.37	198.05	301.56	124.45	98.77	105.87
3. Jowar	-	-	-	-	-	-	-	-
4. Gram	197.22	167.44	168.75	226.20	310.55	141.10	108.28	85.23
5. Tur	190.74	227.78	219.64	272.32	268.75	126.38	105.26	129.29
6. Mung	184.72	179.17	237.50	392.09	304.69	126.38	134.36	-
7. Groundnut	288.74	307.09	235.27	303.41	420.03	159.00	116.56	167.55
9. Safflower	238.74	254.31	190.62	230.21	-	138.71	100.97	143.12
11. Cotton	-	-	-	-	-	-	-	-

**Table A.4.3. Relative Prices of Principal Crops in Pune Market  
(Base crop: Bajra = 100)**

Crops	1960- 61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69
Wheat	134.63	114.14	117.70	132.98	127.07	120.49	-	-	-
Jowar	-	-	108.94	101.05	92.42	50.13	65.65	62.47	64.93
Gur	115.09	80.81	135.75	220.74	130.44	60.62	110.76	220.67	199.59
Onion	30.01	45.29	45.43	50.12	34.41	20.23	42.04	21.69	42.38
Potato	69.81	109.59	104.47	95.35	88.09	48.49	84.10	85.71	53.60
Sugarcane	-	-	-	-	8.66	6.34	7.34	20.24	12.98

Crops	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
Wheat	-	-	-	-	126.91	-	-	-
Jowar	66.25	61.71	73.91	48.43	42.08	99.87	118.40	-
Gur	110.62	99.62	145.61	148.39	122.41	109.01	134.82	179.73
Onion	35.79	26.76	42.23	36.39	41.64	26.29	59.90	32.66
Potato	65.02	81.80	71.93	65.10	64.11	55.14	55.06	85.78
Sugarcane	10.67	11.08	18.08	11.37	9.86	8.88	9.27	11.23

**Table A.4.4. Relative Prices of Principal Crops in Srirampur Market  
(Base Crop : Bajra = 100)**

Crops	1960- 61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69
1. Wheat	117.98	-	121.77	129.65	132.75	110.47	119.95	145.47	128.36
2. Jowar	85.14	78.52	89.09	86.91	84.77	50.04	65.13	63.78	60.85
7. Groundnut	136.63	134.04	135.64	169.39	116.68	105.97	159.74	139.71	134.28
10. Gur	97.14	78.68	124.79	202.74	121.65	66.48	114.45	206.90	175.68
12. Sugarcane	-	-	-	-	-	-	8.20	18.31	62.72

Crops	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
1. Wheat	115.69	120.14	132.62	101.73	132.55	115.84	133.00	131.10
2. Jowar	60.17	62.73	75.34	50.99	43.96	102.13	127.76	128.55
7. Groundnut	163.14	174.49	181.62	149.78	197.38	164.49	150.14	204.18
10. Gur	71.41	85.01	171.30	150.23	112.64	102.39	130.90	176.81
12. Sugarcane	9.98	10.57	17.10	12.51	9.60	9.22	10.95	11.16



**Table A.4.5. Number of Waterings and Interval Between Waterings, in Different Seasons, for Different Crops under Canal and under Wells in PLBC Command Area**

Season	No. of waterings		Interval between waterings (days)	
	Canal	Well	Canal	Well
<b>Sugarcane (Adsali)</b>				
1. Summer 1978	4 - 5	7 - 9	26	15 - 17
2. Kharif 1978	5	7	17 - 21	16
3. Rabi 1978	6 - 7	9	20	14
4. Kharif 1979	5	7	21	16
5. Rabi 1979	6 - 7	6 - 8	18	15
<b>Sugarcane (Ratoon)</b>				
1. Summer 1978	4	7	27	17
2. Kharif 1978	5	7	20	16
3. Rabi 1978	6	8	20	16
4. Kharif 1979	6	7	20	16
5. Rabi 1979	3-7	7	19	15
<b>Sugarcane (Suru)</b>				
1. Summer 1978	6	8	21	20
2. Kharif 1978	5	7	18	16
3. Rabi 1978	8	8	17	14
4. Kharif 1979	6	6	18	16
5. Rabi 1979	7	8	15	15
<b>Sugarcane (Adsali)</b>				
2. Kharif 1978	2	2	24	21
4. Kharif 1979	5	2	15	10
<b>Groundnut (KH.)</b>				
1. Summer 1978	-	9	-	15
2. Kharif 1978	4	5	20	17
3. Rabi 1978	-	9	-	15
4. Kharif 1979	4	3	18	21
<b>Pulses</b>				
2. Kharif 1978	3	2	21	22
3. Rabi 1978	-	4	-	21
<b>Maize</b>				
2. Kharif 1978	3	3	22	21
3. Rabi 1978	4	4	21	15
4. Kharif 1979	3	5	20	18
<b>Hybrid Jowar</b>				
2. Kharif 1978	3	3	22	21
3. Rabi 1978	2	-	26	-
4. Kharif 1979	2	2	36	22

(Contd.)

Table A.4.5. (contd.)

Season	No. of waterings		Interval between waterings (days)	
	Canal	Well	Canal	Well
<b>Cotton</b>				
2. Kharif 1978	-	5	-	13
3. Rabi 1978	-	7	-	15
<b>Lucern</b>				
1. Summer 1978	5	11	21	11
2. Kharif 1978	5	8	19	14
3. Rabi 1978	6	11	19	12
4. Kharif 1979	5	9	15	14
5. Rabi 1979	7	13	8	8
<b>Wheat</b>				
3. Rabi 1978	4	5	22	17
<b>Gram</b>				
3. Rabi 1978	2	2	24	22
<b>Onion</b>				
3. Rabi 1978	-	10	-	11
<b>Jowar (R)</b>				
3. Rabi 1978	2	3	25	22
<b>Chillies (K and R)</b>				
2. Kharif 1978	-	9	-	13
3. Rabi 1978	-	7	-	16
4. Kharif 1979	-	14	-	8
<b>Vegetables (K and R)</b>				
2. Kharif 1978	6	6	15	15
3. Rabi 1978	3	5	20	15
4. Kharif 1979	6	6	20	19
<b>Cotton (Summer)</b>				
1. Summer 1978	4	5	18	16
2. Kharif 1978	4	4	19	15
<b>Groundnut (Summer)</b>				
1. Summer 1978	4	3	22	17
2. Kharif 1978	3	4	23	20
<b>Fruits</b>				
1. Summer 1978	3	6	26	20
2. Kharif 1978	4	5	24	16
3. Rabi 1978	5	7	22	18
4. Kharif 1979	-	4	-	15
5. Rabi 1979	-	8	-	15

**Table A.4.6. Number of Waterings and Interval Between Waterings in Different Seasons, for Sugarcane and Onion, under Canal and Well Irrigation in NLBC Command Area**

Season	No. of waterings		Interval between waterings	
	Canal	Well	Canal	Well
<b>Sugarcane (Adsali)</b>				
1. Summer 1978	6.5	8.47	18.75	14.57
2. Kharif 1978	6.15	6.0	18	18.46
3. Rabi 1978	10.73	8.43	11.6	14.07
4. Kharif 1979	5.5	5.65	17.5	18.71
5. Rabi 1979	12	7.7	10	12.75
<b>Sugarcane (Ratoon)</b>				
1. Summer 1978	-	9.62	-	11
2. Kharif 1978	-	6.15	-	17.55
3. Rabi 1978	-	10.21	-	12.59
4. Kharif 1979	-	6.3	-	18.5
5. Rabi 1979	-	7.75	-	15.13
<b>Sugarcane (Suru)</b>				
1. Summer 1978	-	7	-	16.3
2. Kharif 1978	-	6	-	19
3. Rabi 1978	-	6.6	-	15.83
4. Kharif 1979	-	6.5	-	17.18
5. Rabi 1979	-	6.67	-	16.29
<b>Onion (K and R)</b>				
2. Kharif 1978	-	6.33	-	17.33
3. Rabi 1978	-	14.3	-	10.00

\* The canal irrigated in this non-perennial zone, is partly by special permission, and in other cases appear unauthorised. That may account for many rotations, taking water twice in the same rotation.

## CHAPTER V

### Prospects for Sugarcane under wells

5.1 The distinct superiority of seasonal crops over sugarcane, in generating income from a given quantity of irrigation water, would imply a denial of canal water for sugarcane in the potentially water-short regions of the State. This policy implication raises a number of questions : (a) In the first place, it is pointed out that Maharashtra today produces a sizeable proportion of the total

sugarcane and sugar produced in the country. A sudden cessation of this will seriously affect not only the sugar supply position, but will greatly raise the relative price of sugar. This in turn will affect the relative economics of sugarcane and seasonal crops under canal irrigation in the State, thereby upsetting the very empirical basis of the policy. (b) Even if the new policy is applied, to start with, to only the new irrigation projects to be brought into existence in the State, and

the change over in the old project areas is only slow and gradual, this may affect the relative price of sugarcane, arising out of the growing demand for sugarcane, that has a fairly high income elasticity of demand, in the years to come. The result may be the same as in (a) above. (c) Maharashtra has developed a large number of sugar mills, most of them in the co-operative sector, (more than 60) during the last three and half decades, based on water for sugarcane. A reversal of policy in this regard will see huge losses for the sugar mill enterprises, and decline and death of this industry that has been the source of growth of indigenous enterprise in many other fields, as well as considerable social investments and development. These questions are sought to be discussed in what follows.

5.2 The demonstration of the inferiority of sugarcane under canal irrigation, from the point of view of the social economy, cannot be construed to mean a sudden reversal of the present policy of assured irrigation water to sugarcane grown on certain portion of the ICA of any existing project. Apart from the unreality or impracticability of such a sudden switch over, there are problems of organising the irrigation system to meet the requirements of the new approach. Some of these were examined in the previous chapter. What one might reasonably advocate and expect to be followed is the adoption of

this new policy in all the newer flow irrigation projects in the water scarce regions of the State. In addition, it would be necessary to correct the irrigation channel structures in the existing flow irrigation project to operate the RWS system, and simultaneously notify the irrigators in the command area of a gradual reduction in sugarcane area under canal, including well-irrigated sugarcane area getting supplementary water from canals, to nil by the end of a reasonable number of years.

5.3 This policy will bring about no sudden changes in the supply of sugarcane in these areas. What is more, it is fair to expect other sources of sugarcane supply to step into these potential vacuum caused by the change in irrigation policy. Two of these deserve mention here.

5.4 In the first place, it is fair to expect the potentially irrigation water abundant regions to grow sugarcane, assuming other agronomic conditions are favourable. The Indo-Gangetic plains, which are such regions have been traditionally sugarcane growing areas. Agronomically, these are also considered suitable regions. For variety of reasons, the production of sugarcane there has been of a poorer quality and quantity. The growing need to diversify agriculture from the overwhelming stress on wheat and rice, should lead to better growth of cane in the

region. The pressing market situation with regard to both wheat and rice and the emerging situation with regard to sugarcane is likely to promote this development.

5.5 The implicit rise in the relative price of sugarcane, can be expected to be held in check by this development. At the same time, it is useful to remind ourselves that even a 50 per cent or higher rise in the relative price of sugarcane in 1981-82 did not appear to put sugarcane in a superior position *vis-à-vis* other crops in Western Maharashtra. This is a reasonable limit within which the relative price of sugarcane may be expected to fluctuate in the ensuing years, thereby creating no condition to upset the factual basis of the new policy.

5.6 A second source of supply of sugarcane in Maharashtra is wells, and this is likely to continue to be so. Indeed, over years, wells in the command areas of the flow irrigation projects in Western Maharashtra have come to be the major source of production of sugarcane. In 1962, the Maharashtra State Irrigation Commission pointed out that while 12,000 acres of sugarcane were under perennial flow irrigation in the two Pravara canal areas, the sugarcane area under wells in the command was about 10,000 acres. By 1980, while the canal irrigated basic sugarcane area had come down to

about 7,500 acres, the sugarcane area under wells had risen from 10,000 acres to 27,000 acres.

5.7 Indeed, realising the social injustice of concentrating the bulk of the scarce irrigation water on a small portion of the cultivated land (and cultivators) growing sugarcane under the block system, the State Government by a resolution in 1965<sup>[1]</sup> introduced the 1:4 Block system in place of the 1:3 blocks for sugarcane. However, wherever this has been implemented, the reduction of area under canal has been more than made good by the increase in area under well irrigation. Of course, it is necessary to note that in many instances the sugarcane lands normally irrigated from wells, are given a few supplementary irrigations from canals in the hot weather when the water in the well becomes inadequate for the purpose.

5.8 The major source of ground water in the command areas of irrigation projects is the water seeped underground from the canals and the irrigated fields. The data and observations of the Ground Water Survey and Development Agency in the state also bear out the fact that the ground water potential, reusable for irrigation, is larger in the command areas of perennial canals. Ground water potential, without and with canal irrigation, has been assessed by the Agency for six different project areas, given below.

**Number of Wells Possible in the Command Areas of Some Irrigation Projects in Maharashtra, with and Without Recharge from Canals**

Name of Project	No. of wells possible without recharge from canals	No. of wells possible with recharge from canals
1. Bhima	1,530	6,700
2. Krishna	1,905	3,340
3. Kukadi	5,255	4,860
4. Upper Penganga	1,620	3,530
5. Upper Wardha	1,475	2,230
6. Warna	1,770	4,800
<b>TOTAL</b>	<b>13,555</b>	<b>25,460</b>

Source: *Maharashtra Composite Irrigation Project, feasibility Report*, Vol. I, New Delhi: Water and Power Development and Consultancy Service (India) Ltd., May 1979, Table 1, p. 103.

5.9 Data relating to areas irrigated from canals and wells in case of the sample farmers in. PLBC and NLBC (non-perennial zone) presented in Tables A.3.3, A.3.4, A.3.5 and A.3.6 above, bear this out. The data show that the larger the total irrigated area under canals the larger the total area irrigated by wells. This is essentially due to greater seepage. For the same reason, given the total net irrigated area from canals, the greater the area under sugarcane, proportionately higher the area irrigated from wells in the command. This is indicated by the gross cropped area under wells as a proportion of the gross cropped area under canals being somewhat higher in case of the sample farmers under PLBC, which had sugarcane under canal, than under NLBC, which had little, being in the non-perennial zone.

5.10 The quantity of water in the wells in the command area and outside, in different seasons of the year, has been routinely collected for consecutive years by the GSDA for a few (7 or 8) observation wells in the Pravara Canal area. The height of water columns in the wells during October, December, March and May are observation wells in the Pravara Canal area. The height of water columns in the wells during October, December, March and May are presented for 4 years in Appendix Table A.5.1. These data naturally show variations from well to well. But the general feature that comes out of these data is that the water column in the wells located outside the command area becomes smaller by May, than that in the wells located within the command area, while the wells outside the command area are on an average, deeper than those within the command. However,

these data relate to a few wells only.

5.11 In order to get information from a large sample of wells about this and other relevant information, a special survey of wells was conducted in the command areas of PLBC and NLBC. The total number of wells surveyed during 1979-80 in PLBC command was 299, and in the NLBC (non-perennial zone) command was 209. A few wells, 14 and 8, respectively, were also surveyed outside the PLBC and NLBC commands. The number of wells outside the command was understandably much smaller, and it would have meant field work over very wide areas to cover a larger number of wells. Some relevant data relating to the wells are presented in Appendix Tables A.5.2 to A.5.7. Distribution of wells according to the height of the water column in the different seasons shows that a large proportion of wells outside the command had smaller water columns, particularly in the Rabi and Summer seasons than those within the neighbouring canal command. Similarly, pumps on a somewhat larger percentage of wells within the command could pump for longer hours at a time, and a somewhat larger percentage of wells within the command took less time to refill than those outside the command, particularly in summer and even in Rabi season. This is because of the recharging of ground water from canals and irrigated fields,

through seepage, a facility absent for wells outside the command. The most important point, however, is the much larger number of wells in the command area, due to the possibility of tapping seeped water.

5.12 Thus, there is no doubt that sugarcane can be and is grown under well irrigation in the command areas of irrigation projects without any water being provided specifically to sugarcane from the canal. Of course, the area under sugarcane will be limited to the area that can be irrigated from the wells in summer. The ability of the wells, even in the command area, to irrigate, goes down very considerably in summer. Tables A.5.2 and A.5.5 show that while more than 80 per cent of the wells in PLBC command and 70 per cent of the wells in NLBC command had water columns of more than 11 feet in Kharif and Rabi season, about 47 per cent of the wells in PLBC command had less than 7 feet of water in summer 1 and this proportion in NLBC command was as high as 62 per cent. It is not surprising, therefore, that on about 40 per cent of wells in PLBC command pumps could work for less than 2 hours at a time in summer, and more than half the wells needed more than 8 hours to be refilled for the next 2 hours of pumping. In NLBC command the situation was a little more difficult: more than 53 per cent of the wells could stand

continuous pumping of water for less than 2 hours only, and more than 71 per cent of the wells needed more than 8 hours rest to be refilled to permit another round of pumping for an hour or two.

5.13 The, observed differences between the irrigation capacity of wells in these two commands, as elsewhere, would depend partly on the underground geological structure, and partly on the amount of water flowing through the canals and the amounts applied to the fields, we have little information on the first aspect. But, as for the second, it is known that a larger proportion of the gross cropped area of farmers in the command of PLBC came under canal irrigation and more than 30 per cent of the total canal water was given to sugarcane. Therefore the percentage of gross cropped area under well irrigation was also high - somewhat higher than under canal irrigation, but nearly 28 per cent of the total cropped area under wells was under sugarcane. As against this, in the non-perennial zone of NLBC a smaller percentage of the gross cropped area of farmers covered by the canal command was under canal irrigation, and therefore the percentage of area under well irrigation and also smaller, though it was higher than under canal. But what is more, only 10 per cent of the gross cropped area under wells was under sugarcane. This was mainly because the

volume of water per acre of net irrigated land was smaller here since there was no sugarcane under canal, and hence the wells had lesser seeped water to trap. It is necessary to mention here that the 28 per cent of cropland under sugarcane in the well-irrigated lands in PLBC command overstates the potentiality of the wells there: for a sizeable part of this sugarcane-under-wells heavily depended on 2-3 supplementary irrigations from the canal in summer.

5.14 Similar example presented in the Interim Report- of Committee to study the Introduction of Eight Monthly Supply of Water on the Irrigation Projects of Maharashtra (February, 1979), relating to the Adhala Project in Ahmednagar district (paragraphs 47 to 52), shows that while 10 of the 20 thousands acres of the culturable command area was being irrigated in the 3 seasons, without sugarcane or other perennials, there was more than 2,500 acres under wells in the command of which anywhere between 40 to 50 per cent was under sugarcane.

5.15 Therefore, while it is difficult to predict with any degree of accuracy the extent to which sugarcane can be grown under wells in the command area of canals not providing any water to sugarcane and other perennial crops, it appears reasonable to suggest that at least as much area can be brought under wells as under



canals, and the sugarcane area under wells can vary from 10 to 40 per cent of the gross cropped area under wells, depending on the soil structure, sub-soil layers and the number of wells sunk in the command area.

5.16 Before discussing the further problems arising out of growing of sugarcane under well irrigation in the command area of canals, a couple of related questions may be examined here. In the first place, it is possible to consider other forms of conjunctive use of surface and ground water visualised here, namely canal water for non-perennials only and well water for all crops including sugarcane and other heavy water using crops. The Maharashtra State Irrigation Commission, in its Report in 1962 examined four different alternatives. (These have been fully examined in the *Interim Report* referred to in paragraph 5.14 above.) The Commission did not visualise complete stoppage of canal water for sugarcane, while the canal was running for all the 12 months. It, however, examined cessation of canal water supply to sugarcane for Kharif and Rabi periods. This was ruled out on the ground that since canal would be flowing during the period for other crops, it would be administratively difficult to control unauthorised use of canal water for sugarcane. If the proposal mooted here had been examined, it presumably would have been rejected on identical ground. The proposal to close the canals from

March to May was also rejected since stoppage of flow in the canals would dry up the wells as well, leading to cessation of sugarcane. Therefore, alternative irrigations for sugarcane, with the other half from wells, was the alternative form of conjunctive use of surface and ground water advocated by the Commission.

5.17 The introduction of volumetric water supply, calculated for each field, under the RWS system should go a long way to meet the administrative difficulties the Commission visualised for a seasonal crop based irrigation. Since every irrigator's volume of water and therefore the time available for irrigation is to be rigidly fixed, there is no chance of stealing water under the pretext of the "field not yet being fully irrigated", as is the situation at present. Of course, this would not preclude an irrigator from using his water quota for sugarcane, even if the amount had been worked out on the basis of a seasonal crop. If a farmer does so, he can irrigate only a small fraction of his total irrigable area, since sugarcane takes many times more water than other seasonal crops. If the exercises in this study are correct representation of the prevailing economics of use of water, the farmer will suffer a loss of total income thereby. If nevertheless he chooses to do so, it would not be necessary to seek to force him to do what was planned. That, in any case, would be administratively difficult. Therefore, the proper approach appears to be to calculate the volume of

water a cultivator would need in a season - and in its rotations - based on an economic seasonal crop pattern, and ensure prorata delivery for each rotation. Then it should be left to the cultivator to decide the particular use to which he will put this water.<sup>[2]</sup> If he chooses to grow sugarcane with the water, no one need hold back his hand. Hopefully such farmers will learn, sooner than later. Sugarcane in canal area of Maharashtra is popularly in the village referred to as the "idleman's crop", since it requires the least attention and timely care. If the farmer chooses to be "idle" and pay a price for this in terms of lost income, it cannot be helped. It is, however, reasonable to think that most farmers will see the loss and act otherwise.

5.18 One reason why farmers do not follow this logic in regard to their well water may be this. However, one would think that if a farmer has more water in the well compared to his land area, he would be economically rational in using the excess water for sugarcane. From the social point of view, such a situation does not exist in regard to canal water, and, therefore, its use for sugarcane does not appear justifiable.

5.19 Confining canal irrigation to seasonal crops would result in the actual irrigated area being extended beyond that when it is permitted. In regard to PLBC, we find that sugarcane used more than 2.9 lakh acre inches of the 9.5 lakh acre

inches of water let out at the distributory head, calculating on the base of the regression coefficients in Chapter II and the rotation-wise total sugarcane area receiving water. This makes it over 31 per cent of the total irrigation water. It is presumably more, may be about 40 per cent, for reasons discussed in Chapter II. If this water were to be made available to a single crop in the Rabi season, say jowar or wheat (HYV) then the irrigated area under PLBC can extend by at least 12 thousand or 8,500 acres (possibly more) ... Today only about 25,000 of the 40,000 acres under ICA are provided with water from PLBC. The alternative will cover the bulk of I.C.A. If the water is given for two different seasonal crops, say Jowar (Hy.) in Kharif and Wheat and/or onion in Rabi, then the net irrigated area can expand by another 3 thousand acres.

5.20 Such a diversion does not imply no irrigation in summer. Indeed, as we have seen in PLBC and NLBC command, groundnut and longstaple cotton are also irrigated in Summer, besides Rabi crops like onion which have a carry over requirement of water in early summer. This will keep the canal flowing, even if the full 3-season crop rotations discussed in Chapter III are not fully followed that in turn will recharge the wells, which will help sugarcane in summer. An even more important requirement is the need for drinking water in summer, which in many areas depends heavily on the canals

flowing in summer. It is for these reasons that complete closure of canals after February or March may not be justifiable.

5.21 Extension of the irrigable area under the canal would not seriously affect the area under sugarcane, since a growingly larger proportion of the sugarcane in the canal areas is being grown under well water.. Stoppage of sugarcane under canal, including supplementary irrigation in Bummer to sugarcane under wells, will directly reduce the sugarcane area under canal and also reduce somewhat the area under wells in the existing irrigated area. As against this, extension of canal irrigation to unirrigated areas will increase the scope for sinking wells and using a part of this water for sugarcane. This may, in the net, result in greater spread of well irrigation, including sugarcane under wells, the historical development of concentrated area of sugarcane cultivation under canal has resulted in concentration in well irrigation as well. That largely explains the growth of individual sugar factories, starting with a crushing capacity of 400 tonnes, now reaching more than 4,000 tonnes. It is this geographical concentration of sugarcane cultivation which is likely to be affected by the change in the use pattern of canal water. In the areas to be newly irrigated by new irrigation projects in the region, this may mean smaller sugar mills scattered over the entire irrigated area, possibly manufacturing brown sugar,

with a single central cooperatively owned mill processing all this brown sugar into white the year round, these are technical possibilities, the economics of which has to be worked out before adoption. In the already established commands, the change over has to be gradual, and wells in the command, existing and new, should be able to meet the normal needs of the established sugar factories. In recent years the crushing season has often extended beyond appropriate limits to accommodate excessive sugarcane supply in the season. Restoration of normalcy in this matter should not cause any difficulties. The *Interim Report*, referred to above, visualises at most reallocation of a stray factory in the Pravara belt. All in all, therefore, there appears no possibility of sugarcane disappearing or its area in the existing canal commands being substantially reduced as a result of change in policy in regard to use of canal water. The advantages will be substantial: not only will canal water irrigate larger areas bringing greater stability to seasonal agriculture in this drought-prone region and benefit larger body of farmers, but also spread the benefits of well irrigation, including cultivation of sugarcane and other perennials, over wider areas and larger body of farmers.

#### NOTES

1. Gandhi, P.R., *op.cit.*, p. 127.
2. A similar approach has been advocated by Dhamdhare and Padhye in their paper, *op.cit.*

## APPENDIX TABLES

Table A.5.1. Height of Water Column Different Periods in a Year in the Observation Wells

## (a) Outside the Command Area of P.L.B.C.

Obs. Well No.	Depth of well	1975				1976			
		March	May	October	Dec.	March	May	October	Dec.
1.	13.41	4.12	3.03	3.97	6.61	6.74	5.75	6.09	11.02
2.	14.25	-	-	-	-	-	-	-	-
3.	10.51	5.17	3.15	7.72	8.28	7.46	5.58	8.42	9.70
4.	9.14	4.33	3.25	7.79	7.76	7.05	6.24	6.65	8.35
5.	9.14	3.58	3.10	5.15	3.61	3.35	Dry	3.60	7.05
6.	15.66	10.13	9.17	14.25	13.01	12.31	11.63	12.76	14.33
7.	12.10	10.88	10.93	11.04	11.03	11.03	10.84	10.83	10.75

Obs. Well No.	Depth of well	1977				1978				1979	
		March	May	October	Dec.	March	May	October	Dec.	March	May
1.	13.41	5.21	3.46	3.91	4.41	4.11	3.81	-	-	-	-
2.	14.25	-	-	-	-	-	-	-	3.00	1.90	1.03
3.	10.51	7.16	5.56	5.61	5.76	5.41	3.51	4.03	4.66	4.01	dry
4.	9.14	6.14	5.64	5.89	6.24	6.14	4.89	5.14	5.24	4.94	2.84
5.	9.14	1.24	0.24	3.59	3.54	3.54	0.49	2.24	2.64	2.84	1.84
6.	15.66	11.56	10.61	10.31	12.61	11.81	10.31	11.56	11.81	-	9.16
7.	12.10	10.95	10.80	10.85	11.10	10.95	10.90	10.90	-	-	6.00

**(b) Within the Command Area of P.L.B.C.**

Obs. Well No.	Depth of well	1975				1976			
		March	May	October	Dec.	March	May	October	Dec.
1.	10.28	3.38	2.63	6.62	4.58	2.72	1.77	3.42	7.96
2.	11.88	7.00	4.72	7.42	8.19	7.59	6.50	7.38	10.43
3.	8.53	3.65	-	5.01	4.38	4.29	3.78	4.49	7.17
4.	11.58	3.40	2.49	4.88	3.96	10.54	3.28	2.99	8.82
5.	10.36	3.31	2.49	5.05	4.90	5.59	5.57	6.09	9.11
6.	13.72	6.71	3.19	9.96	8.43	6.80	6.34	8.28	11.88
7.	11.28	6.02	4.77	5.54	5.48	5.41	5.21	4.70	9.27
8.	13.25	9.43	8.72	11.99	10.84	9.67	8.42	10.36	12.11

Obs. Well No.	Depth of well	1977				1978				1979	
		March	May	October	Dec.	March	May	October	Dec.	March	May
1.	10.28	2.58	1.83	2.78	2.68	2.08	2.08	3.49	3.48	2.58	2.30
2.	11.88	6.73	5.93	6.38	6.43	4.63	4.13	5.41	5.88	4.93	3.43
3.	8.53	4.03	3.03	3.83	4.33	4.13	3.58	4.08	4.83	4.43	4.13
4.	11.58	2.58	1.93	2.83	2.48	2.58	1.98	2.43	-	-	-
5.	10.36	6.16	6.31	6.66	7.06	7.26	-	-	7.16	6.46	-
6.	13.72	7.12	6.52	9.72	7.82	7.37	6.67	7.20	7.72	6.92	7.38
7.	11.28	4.70	4.53	5.28	5.13	4.23	4.58	3.98	5.13	4.13	3.73
8.	13.25	8.25	7.20	8.00	9.00	8.15	6.70	5.26	7.30	7.10	5.77

Source: Ground Water Survey Development Agency, Government of Maharashtra, Pune.

**Table A.5.2. Distribution Wells Within and Outside PLBC Command According to Water Column in Three Seasons, 1979-80.**

Water Column (ft.)	wells				Water Column in summer (ft.)	wells	
	Within Command		Outside			Within Command)	Outside
	Kharif	Rabi	Kharif	Rabi			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
More than 20'	170 (56.86)	93 (31.1)	8	6	More than 15'	17 (5.69)	-
11' to 20'	109 (36.45)	167 (55.85)	3	5	8' - 15'	131 (43.81)	6
6' to 10	10 (3.35)	25 (-8.36)	-	-	4' - 7'	113 (37.79)	4
5' or less	3 (1.00)	6 (2.01)	1	1	3' or less	26 (8.7)	2
Not observed	7 (2.34)	8 (2.68)	2	2	Not observed	12 (4.01)	2
TOTAL	299 (100)	299 (100)	14	14	TOTAL	299 (100)	14

Figures in brackets are percentages to total.  
Source: Special Sample Survey.

**Table A.5.3. Distribution Wells According to Hours of Pumping from Well at a Time, in Three Seasons in 1979-80 in and Outside PLBC Command**

Working Hours of Pump	Wells Within Command			Wells Outside		
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
(1)	(2)	(3)	(4)	(5)	(6)	(7)
- 2 hrs.	7 (2.34)	9 (3.01)	115 (38.46)	1	2	6
2 - 4 hrs.	15 (5.02)	30 (10.03)	68 (22.74)	2	1	4
4 - 6 hrs.	17 (5.69)	38 (12.71)	29 (9.7)	1	2	1
6 - 8 hrs.	17 (5.69)	36 (12.04)	31 (10.37)	2	2	1
More than 8 hrs.	229 (76.59)	170 (56.86)	36 (12.04)	7	6	-
Not stated	14 (5.68)	16 (5.35)	20 (6.69)	1	1	2
TOTAL	299 (100)	299 (100)	299 (100)	14	14	14

Figures in brackets indicate percentages to total.  
Source: Special Sample Survey.

**Table A.5.4. Distribution of Wells According to Hours Taken to Refill in 3 Seasons in 1979-80, Within and Outside the PLBC Command**

Working Hours of Refill	Wells Within Command			Wells Outside		
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
(1)	(2)	(3)	(4)	(5)	(6)	(7)
- 2 hrs.	201 (67.23)	144 (48.16)	39 (13.05)	6	5	-
2 - 4 hrs.	18 (6.02)	28 (9.36)	25 (8.36)	2	3	-
4 - 6 hrs.	14 (4.68)	27 (9.03)	39 (13.04)	-	1	-
6 - 8 hrs.	14 (4.68)	21 (7.02)	24 (8.03)	1	-	2
More than 8 hrs.	34 (11.37)	60 (20.07)	151 (50.5)	4	4	10
Not stated	18 (6.02)	19 (6.35)	21 (7.02)	1	1	2
<b>TOTAL</b>	<b>299</b> <b>(100)</b>	<b>299</b> <b>(100)</b>	<b>299</b> <b>(100)</b>	<b>14</b>	<b>14</b>	<b>14</b>

Figures in brackets indicate percentages to total.  
Source: Special Sample Survey.

**Table A.5.5. Well Classified According to Water Column in NLBC (Non-P) Command, and Out Side, During Three Seasons, 1979-80**

Water Column (ft.)	wells				Water Column in summer (ft.)	wells	
	Within Command		Outside			Within Command)	Outside
	Kharif	Rabi	Kharif	Rabi			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
More than 20'	106 (50.72)	58 (27.75)	3	1	More than 15'	4 (1.91)	-
11' to 20'	78 (37.32)	94 (44.98)	2	3	8' - 15'	57 (27.27)	1
6' to 10	13 (6.22)	44 (21.05)	2	3	4' - 7'	93 (44.50)	3
5' or less	2 (0.96)	3 (1.44)	-	-	3' or less	37 (17.70)	2
Not observed	10 (4.78)	10 (4.78)	1	1	Not observed	18 (8.61)	2
TOTAL	209 (100)	209 (100)	8	8	TOTAL	209 (100)	8

Figures in brackets indicate percentages to total.  
Source: Special Sample Survey.

**Table A.5.6. Distribution of Wells According to Hours of Pumping from Well at a Time, in 3 Seasons in 1979-80, Within and Outside NLBC Command**

Working Hours of Pump	Wells Within Command			Wells Outside		
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Upto 2 hrs.	3 (1.44)	8 (3.83)	111 (53.11)	-	-	4
2 - 4 hrs.	26 (12.44)	49 (23.44)	46 (22.01)	2	3	1
4 - 6 hrs.	16 (7.66)	32 (15.31)	9 (4.31)	2	3	-
6 - 8 hrs.	17 (8.13)	22 (10.53)	3 (1.44)	1	-	-
Above 8 hrs.	135 (64.59)	86 (41.15)	7 (3.35)	2	1	-
Unstated	12 (5.74)	12 (5.74)	33 (15.79)	1	1	3
TOTAL	209 (100)	209 (100)	209 (100)	8	8	8

Figures within brackets indicate percentages to total.

Source: Special Sample survey.

**Table A.5.7. Distribution of Wells According to Hours Taken to Refill, in 3 Seasons in 1979-80, Within and Out Side The NLBC Command**

Hours Taken Refill	Wells Within Command			Wells Outside		
	Kharif	Rabi	Summer	Kharif	Rabi	Summer
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Upto 2 hrs.	93 (44.5)	47 (22.4)	7 (3.35)	2	1	-
2 - 4 hrs.	6 (2.87)	5 (2.39)	10 (4.78)	1	1	-
4 - 6 hrs.	13 (6.22)	8 (3.83)	6 (2.87)	-	-	-
6 - 8 hrs.	7 (3.35)	16 (7.66)	3 (1.44)	1	1	1
Above 8 hrs.	50 (23.92)	98 (46.88)	159 (71.29)	3	4	4
Unstated	40 (19.14)	35 (16.75)	34 (16.27)	1	1	3
TOTAL	209 (100)	209 (100)	209 (100)	8	8	8

Figures within brackets indicate percentages to total.

Source: Special Sample Survey.



## CHAPTER VI

### Costs of the Change in Pattern of Use of Canal Water

6.1 The examination of the economics of change in use of canal water has so far been in terms of the net returns from irrigation with a given quantity of water. The alternative use patterns would also mean a change in cost of supplying water. These costs will be mainly of two types: Given the total volume of water stored in the reservoir,<sup>[1]</sup> a larger irrigated area will mean longer canals, distributories, minors and water courses~ thereby increasing capital cost of the project. Secondly, carrying a given volume of water over longer distances in the channels will mean greater loss of water through seepage, and this loss, which depends essentially on the soil surface that the water comes in contact with, will be proportionately higher than the increase in the length of the carrying channels. The increased net incomes have to be juxtaposed against these increased capital costs in order to find out if the project is economically justifiable.

6.2 If the canals have to be extended to irrigate larger areas, the capital cost of the project, including the headworks, per acre of irrigated land will be smaller: while the canal costs per kilometer may be assumed to be uniform, the fixed costs of the headwork, etc., would now be distributed over a larger irrigated area.

6.3 As for the loss of water in transit, it is necessary to recognise that while carrying water over longer distance will increase loss through seepage, not providing water to sugarcane will mean less water supply in summer and therefore a smaller storage in summer in the reservoir. Since loss through evaporation in the reservoir and seepage in the channels is the maximum in summer, it may not be far wrong to assume that in the net there will be no more loss of water than under the sugarcane based irrigation. Therefore, the cost of longer carrying channels is the only additional cost that may be taken into account.

6.4 In the established irrigation systems, like PLBC, this additional channel cost will be the minimum. As was noted in the beginning of this study, the Pravara canal systems were completed by 1924 to irrigate an irrigable command of 40,000 acres under PLBC. But no more than 25,000 acres have been irrigated so far. Our exercise suggests extension of the irrigated area to cover the entire projected ICA. Since the channels already exist, there is no increased capital cost than putting them into working order. The *Interim Report* had estimated a capital cost of the additional canals for the upper Pravara River Project to be around Ra. 813 per acre of irrigated land, at 1975-76 prices. By 1978-79, this may be expected to have increased by about 10 per cent,

say to Rs. 900. Applying that to PLBC area, and calculating interest at 10 per cent, and depreciation at 1 per cent of capital cost, as is the current practice, with the project authorities,<sup>[2]</sup> the annual cost per additional acres will come to Rs. 79. This is considerably lower than the net income expected to be generated by the crops, to be grown on an irrigated acres (without deducting the irrigation charge as cost); for Jowar (Hy-Kharif) it is Rs. 515, for wheat (HYV) it is Rs. 522, for onion in Rabi or summer, Rs. 1110, etc. There is no possibility of any adverse effect on the Benefit-cost ratio of the entire project.

6.5 A similar tentative calculation can be made for the Bhima irrigation system, located in the Solapur district of the State. It was originally projected to have a total irrigated area of 1,26,000 ha, with 1,50,570 ha. to be cropped.<sup>[3]</sup> The area under sugarcane was planned to be 7,938 ha, i.e., 6.3 per cent of the net irrigable area. The capital cost of the entire distribution system, fully lined upto sub-minors (or water courses), serving 8 ha *Chaks*, was estimated at Rs. 12,008 per hectare of net irrigated area, or approximately Rs. 4,800 per acre. A completely unlined structure would cost much more per acre, since lesser quantity of water would be available for irrigation due to seepage. The ultimate irrigation efficiency is estimated at 50 per cent under

lined canals and only 14 per cent under unlined, and the per net irrigated area capital cost under unlined canals is put at 1.43 times that of lined, that is at Rs. 6,860 approximately, this appears very high compared to the figure quoted in the *Interim Report* for Upper Pravara canals, and needs checking, which is not attempted here.

6.6 Sugarcane is denied water and the water saved is given to two seasonal crops on a plot of land in the Kharif and Rabi seasons, say Jowar (Hy-Kharif) and Wheat (HYV) and/or Onion in Rabi season. The net area irrigable would be about 3.89 times, or approximately 4 times the area under sugarcane. This will mean an extension of the net irrigated area by about 24,000 hectares, thereby increasing the net irrigable area under the Bhima Project by 19 per cent.

6.7 The additional capital cost per acre per year would be Rs. 560/- for fully lined canals. The capital cost due to headworks may be added to this. The headworks cost was estimated at Rs. 3,546 per ha. or Rs. 1,418 per acre. Expansion of net irrigated area by 19 per cent will reduce the per acre cost of Rs. 1,192 per acre. The annual equivalent of this, calculated by current methods would be Rs. 131. The total capital cost per year would therefore be Rs. 691 for lined canal. For unlined canals it would be 1.43 times, that is Rs. 988.

6.8 The net returns per acre (gross of irrigation charge) of the 32,000 acres which may be under two irrigated seasonal crops, Jowar (Hy-Kharif) and Wheat (HYV)/Onion, would come to Rs. 1,331 an acre.<sup>[5]</sup> The Benefit-Cost Ratio would be 1.93 for lined canals and 1.38 for unlined canals. All this, without changing the proposed cropping pattern in the rest of the irrigated area. There is nothing to suggest that the capital cost involved in the more extensive irrigation will be too high to adversely affect the Benefit-Cost Ratio.

6.9 A fully worked out crop pattern and its Benefits and Costs for the entire irrigated area under the new policy for water use would surely not affect the Benefit-Cost ratio adversely. Indeed, a more judicious choice of crops, including a lesser stress on high water consuming seasonal crops in summer may improve the B/C. However, there should be no rigidity but flexibility in the matter to face variations in market conditions.

#### NOTES

1. *The Interim Report* (op.cit.) assumes a change in this as well. This is because the Committee advocate design of irrigation dams with 50 per cent dependability instead of 75 per cent as per current practice. This question is not examined in the present study.

2. This practice does not appear

proper, for, as depreciation is recovered year after year, the interest will have to be charged on a reduced value of net investment in succeeding years. The better arithmetic would be to charge an equated instalment at given interest rate and life time of the asset.

3. The data are taken up for an illustrative exercise from the *Maharashtra Composite Irrigation Project - feasibility Report., Vol. I, op.cit.*, from the data relating to the Bhima project in chapters X and IV.

4. As estimated in the Report cited above, *Ibid.* pp. 109-110.

5. The administrative cost, that is operation and maintenance cost is not taken into account here. But according to the State Government of Maharashtra it varies between Rs. 8 and Rs. 20 per acre per year.

#### CHAPTER VII Conclusion

7.1 The basins of most of the rivers flowing in uplands Maharashtra, excepting those in the 5 eastern most districts and to a certain extent the Krishna basin, are potentially water short. These are also regions where rainfall is mostly less than 30 inches in the year and subject to great variation not only from year to year, but also right within the rainy season. Agriculture in these regions is therefore low yielding

and very unstable. Sizeable parts of this region fall in what are called 'famine' and 'scarcity belts'.

7.2 The severe scarcity of irrigation water in relation to total agricultural land in these basins calls for the most economical use of irrigation water. The way to do this is to use the flow irrigation water such as to maximise net returns per unit of water.

7.3 Amongst the crops grown under canal irrigation, sugarcane is the most water using. Though sugarcane occupies less than 10 per cent of the total irrigated land under canals, it consumes at least half the total irrigation water.

7.4 Examination of the economics of net returns per unit of water under irrigation has shown that sugarcane generates the smallest net income per unit of water; indeed most of the food-grains, like jowar, bajra, wheat (especially the hybrid or high yielding varieties of these) give two to four times as much net income as sugarcane, and other seasonal crops, like cotton and groundnut in the Kharif season and onion, chillies in Rabi give almost  $2\frac{1}{2}$  times as much. Whatever might have been the justification in the past to make sugarcane the central crop under a canal

system, the bio-technological developments of the last two decades have changed that.

7.5 The superiority of these other crops over sugarcane remains even in the face of a 25 per cent fall in the relative price or of yield of these crops in any year.

7.6 Even if an acre of irrigated land, taken out from under sugarcane, is put under three succeeding seasonal crops in the three seasons of the year, (thereby increasing the intensity of cropping on this land, as conventionally measured, from 100 to 300) the net irrigated area will increase by anywhere between 30 and 60 per cent, or 50 to 100 per cent in case of suru sugarcane, depending on the crop pattern followed.

7.7 It is, however, not necessary that every acre of land denied canal water for irrigation, must be given water for 3 crops in three seasons. If every plot of land is given water for seasonal crops in any two of the seasons, and not all the three, the net irrigated area can further expand by a third. Estimates also show that even in a new irrigation project with fully lined canals, this meets more than adequately the financial benefit-cost norms. To the benefits must be added the average annual expenditure on famine and scarcity relief works, which will be saved in these areas.

7.8 This wider distribution of water would bring greater stability to agriculture of the region. It would also be much more equitable, in the sense that larger number of farmers can benefit from irrigation by stabilizing their agriculture and reaping higher incomes, though possibly not as high as sugarcane would have permitted.

7.9 Indeed, the present system of irrigation, with the Blocks for various crops, is characterised by inequality of distribution of benefits. The pattern of cropping of the sample farmers surveyed in PLBC command showed that while the smallest size group of farmers had almost half their total operational holding under canal command, they had little land under sugarcane in their canal operated part. Almost all their sugarcane land was under wells. It means, the small farmers in the irrigated villages got little share in the sugarcane blocks that were cornered by the rest, with the largest size group getting the greatest proportionate land under sugarcane block. This was quite contrary to what the Report of the Irrigation Enquiry Committee appointed by the government of Bombay, under the chairmanship of Sir M. Visvesvaraya, very firmly recommended in 1938. Their recommendations are so important and

interesting in the context of the considerations of equity in distribution of scarce water that some extensive quotations may bear reproduction here.

7.10 Laying down the basic approach to the distribution of water, the Committee said:

"26.... It is now proposed to redistribute the irrigable area under each canal as equitably as possible by giving to each village, and as far as possible to each cultivator in it, just enough irrigable land and no more, so that the average available for irrigation may now here constitute a surfeit, and the cultivator, and also the village collectively, may show a better appreciation of the water advantages placed at their disposal."

"29... From the known carrying capacity of a canal and the storage impounded in its reservoir at the end of the monsoon the discharges that can be advantageously maintained in the canal or canals in each of the three seasons - kharif, rabi and hot weather - can be determined. These discharges will show what crop areas can be maintained on canal water in the

three seasons and what the total acreage of all classes of crops should be in a year of average rainfall.

"The acreage of the various crops which can be cultivated under the whole canal being thus determined, this acreage should be distributed by sections - each section representing, say, about 10 miles of the main canal. The crop areas in each section are in their turn distributed by villages, each village receiving 25 to 40 per cent 'of the total cropped area of the village."

"30.... The crop areas allotted to each village will have to be distributed equitably among the whole body of cultivators residing in it by an authoritative Government Committee whose personnel should inspire confidence in the cultivators. Share lists should be prepared for each village on the basis of the acreage of the holdings of individual cultivators.

"The extent and nature of crop areas given to each village and the shares allotted to individual cultivators in its being

known, the grouping of the shares into blocks - sugarcane and two seasonal should be arranged by the Committee with the consent and co-operation of the cultivators."

**"31. Block system of irrigation**

- It has been explained that the bagait or irrigable area allotted to a village should be about one-third of its total cropped area where the whole of it is under command of a canal distributory or distributories, and that the total average allotted to the village should be distributed among its resident cultivators in proportion to the areas of their holdings in the village."

"32.... the object of the block system has been defined to be to distribute the benefits of an irrigation work over as large a number of villages as possible, and at the same time to concentrate the irrigation given to each village on acre as or blocks of a specified extent and in selected soils and situations favourable to irrigation."

"34.... In the land chosen the blocks the owner of the land will not be permitted to irrigate more

than the share allotted to him. On the rest of the land belonging to but not used by him he can only practise dry cultivation. Since he cannot make use of the land himself there will be every inducement for him to lease it to a neighbour either in exchange for a larger area of other land or for some other consideration to persons who may want land to utilize their share of the irrigation available.

"The contemplated exchange of land will be naturally distasteful to the cultivator and opposition must be expected. But we think that the necessary exchange can be effected and Blocks formed with the aid of a Committee of two or three competent officers specially appointed to introduce the system. The officers would select suitable land, plan blocks, negotiate with the cultivators and endeavour to bring about a speedy understanding between them so that all who are eligible for a share in irrigation may find a place within the blocks."

7.11 The Visvesvaraya Committee Report has been quoted extensively

above in order to give a clear understanding of the concern for the necessity of equitable distribution of scarce irrigation water among villages in the command and among all cultivators in a village. There are many who swear by Visvesvaraya's Block system of irrigation in the Deccan (he introduced it in 1903-04 in the Nira Left Bank Canal and it was recommended by the Indian Irrigation Commission of 1904 to be followed in other systems in the region), but they do not recognise that the principle of equitable distribution, so central to his scheme, was not followed after 1938, like it had been changed after 1903-04 when the equitable distribution had been worked out by a local committee similar to one recommended in the Report. Whatever the operational deficiencies of the block system, (pointed out by the Maharashtra State Irrigation Commission, and in the *Interim Report*) the need for equitable distribution emphasized in the Report remains.

7.12 Equitable distribution of water, in addition to the most economical use of water, has to be a central consideration in designing irrigation systems in these potentially water deficit regions. The considerations that led to the pattern of water use in which sugarcane occupied the most important position during the long years till the Second World War, have changed during the last two decades,

leading to the advocacy of a policy of denying canal water to sugarcane. But even under this new approach there will not be enough water for even one irrigated seasonal crop on every piece of land in these regions. Therefore, the necessity of equitable distribution of water, geographical as well as cultivatorwise, so much emphasised by Visvesvaraya, remains.

7.13 The illustrative exercise with regard to the Pravara Left Bank Canal in this study has shown, as stated above, that even if water is given to three different seasonal crops in the three seasons in place of sugarcane for the whole year, the net irrigated area can increase by 30 to 60 per cent. But this will increase the total net irrigated area by only a small percentage since sugarcane occupies a small part of the net irrigated area. If water is given in any two seasons to a field then the net irrigated area will be almost  $3\frac{1}{2}$  to 4 times the area under sugarcane. All this will not bring even the Irrigable Command Area of 40 thousand acres under two-season irrigation, while the total culturable command area is 1,24,561 acres.

7.14 This implies that irrigation water should be distributed over all the villages in the culturable command area proportionately. The implication of this is that

not all cultivated land in the village can be irrigated. The aim should, therefore, be to irrigate as many acres in the villages as can be provided with water for any two seasons, the greater emphasis being on Kharif and Rabi, and only a smaller part in summer. But at the same time, it must be ensured that every cultivator in the village has prorata share in the irrigation water. If this requires some redistribution of land amongst cultivators, because of location disadvantages in relation to the water courses faced by some, this must be brought about by mutual arrangement with official intervention, before any land in the village is provided irrigation water. Finally, a greater weightage should be given to the smallest farmer households, say, those with less than 1 ha. of cultivated land, they should be provided irrigation, of the type specified, on their total holding, and redistribution should take care of that as well. It will not be advisable to confine irrigation of a piece of land to a single season and design and canal system accordingly, as it would mean very low benefit cost ratio per acre of land.

7.15 The Committee, set up by the Government of Maharashtra, to study the introduction of eight monthly supply of water on irrigation projects in Maharashtra, has also recognised, in its *Interim Report*, the need for equitable distribution of water geographically and



cultivator-wise. Its recommendations on the matter (contained in paragraphs 70 to 74) are broadly along similar lines, and deserve serious consideration. The approach of the "Pani-Panchayat" in Pune district, by which the limited water from wells and percolation tanks is sought to be distributed in terms of a given area of irrigated land (growing only low water using crops) per person in the household, irrespective of the total size of land holding, strongly underlines the need for equitable distribution of water.<sup>[1]</sup>

7.16 Equitable distribution of water requires control over the volume of water supplies to farmers. This needs adoption of the Rotation Water Supply System that ensures volumetric supply of water to the field. One advantage of this system would be a single water rate, per unit of water supplies, irrespective of the crop to which it is applied. Once the volume of water to be supplied to a farmer's fields is estimated on the basis of relevant seasonal crops' requirements, there need be no effort made to ensure that the farmer adheres to that crop pattern. If someone chooses to use the specified quantity of water for growing sugarcane, no objection need be taken, since administratively it would be difficult. Given the economics of use of water for different crops, a farmer is sure to learn, sooner than later, about the loss of income

implicit in the use of the limited water for a heavy water using crop like sugarcane grown on a fraction of the irrigable area.

7.17 There appears no immediate prospects of sharp decline in area under sugarcane or cessation of any further increase in its area in the region, as a result of this policy. Wells in the command areas of canal irrigation projects will take care of that.

7.18 Greater economy in the use of irrigation water is sure to be the growing necessity in these water scarce regions of the state. The question will be attacked from many angles, in the years to come. Greater economy in application of water to the fields by various cultural devices, will be one, the adoption of the sprinkler and drip irrigation methods will be another, though their use in canal irrigation will require both power and further capital investments and, therefore; appear to have only a distant possibility. These can be tried out on wells, and already small experiments have been started by farmers. A third line of approach will be the choice of less water consuming crops, depending on emerging market conditions. As elsewhere in India, the average size of cultivated holding in Maharashtra is steadily declining, and larger proportions of cultivators are becoming small and marginal farmers. Simultaneously, urbanisation is

growing, making a growing demand for diverse kinds of farm products like fruits, vegetables, flowers, milk and meat. Many of these are low water using crops (grapes require about as much water as any seasonal crops, so do lucerne/fodder crops, important for dairy and sheep breeding for meat, etc.) with growing market prospects. The small cultivators can earn a better living growing such products on their lands, by economically using irrigation water. Of course, these are not immediate prospects, but the system of water management should evolve in appropriate direction keeping such prospects in view.

7.19 The policy of using water for crops giving the highest net social return per unit of water, is crucial for adjustment to changing prospects. In the present context, it is thrice blessed: it generates greater total social income from a given volume of irrigation water, it ensures a more equitable distribution of this greater social income through more extensive irrigation involving larger body of farmers, and finally, by providing irrigation to larger cultivated areas, growing seasonal crops, it provides greater stability to agriculture of the region, characterised today by high fluctuations in yield and periodic scarcities and famines. Such policy change is, therefore,

imperative for the water scarce regions of Maharashtra, as well as similar other regions in peninsular India.

#### NOTES

1. It is interesting to note that this policy of ensuring the supply of water to crops that help generate the highest income per unit of water is relevant not only for the canal irrigation schemes, but also for lift irrigation schemes. K.P. Deo in his unpublished Ph.D. dissertation entitled "**Economic evaluation of the Lift Irrigation schemes in Maharashtra**" submitted to the University of Poona in July 1979, and deposited in the libraries of the University and the Gokhale Institute of Politics and Economics, Pune) has worked out the net returns to an acre inch of water under alternative cropping patterns for five co-operative lift irrigation schemes operating on Pavana river in Pune district. He shows that the use pattern in which sugarcane is one of the crops generates the smallest net income, and benefits, for the quantity of water permitted by the Government to be pumped from the river, almost half as many acres and cultivators, as under alternative crop patterns excluding sugarcane examined by him in consultation with local cultivator. Unfortunately, financing institutions giving term loans for such projects as well as the irrigation Department giving permission for pumping a given quantity of water during the year, have not examined if the crop pattern proposed by the co-operatives give the highest net income per unit of water and benefits the largest number of cultivators. It appears necessary that this approach be followed in assessing proposal for lift irrigation from rivers and streams in the region, before loans are sanctioned for the purpose.

#### Acknowledgment

The Gokhale Institute has a long standing interest in the economics of irrigation. The first study into the benefits of irrigation in India, in the Godavari and Pravara Canal areas, was carried out by (late) Prof. D.R. Gadgil in the Institute in 1938-40. Again, the first study in India into

Cost-benefit analysis of a newly proposed multipurpose river dam project, at Hirakud on the river Mahanadi in Orissa, was undertaken in the Institute during 1954-58, by Prof. N.V. Sovani and N. Rath. The scholars in the Institute had also been associated with various other enquiries relating to irrigation in the State in later years. In more recent years, there was a growing feeling that there had been some basic change in the techno-economic conditions underlying irrigation in the drought prone, water-scarce regions of the Deccan, and a fresh look at the problem was necessary.

This study has its origin in the many discussions the then Director of the Institute, Prof. V.M. Dandekar and Prof. N. Rath had with the then member of the Central Water Commission (late) Shri C. V. Gole. The Institute proposed this study and the CWC approved it and agreed to finance it. Soon after the proposal was approved, Shri Gole retired and after a brief service abroad, suddenly expired. We would like to pay our tribute to his memory for his deep and persistent interest in not only the technical but also the economic aspects of irrigation in India, which encouraged the Institute to propose this study to the CWC.

The study had an advisory committee whose members changed over the years. In course of our work we received considerable help and advice from Dr. A.B. Joshi, the then Vice-Chancellor of the Mahatma Phule Krishi Vidyapeeth and his successor Dr. D.K. Salunkhe. They made it easy for us to discuss the agronomic points with the faculty of the University, and the Professor of Agronomy made some of his research results available to us. We are thankful to all of them.

Shri V.R. Deuskar, the then Secretary of the Department of Irrigation and a veteran irrigation engineer, was not only a member of the Advisory

Committee, but also took personal interest in the study, and arranged for us, students of economics, to become familiar with the technicalities and administrative arrangement of distribution of canal water. Our thanks are due to him.

Shri M.A. Chitale, who succeeded Shri Deuskar on the Advisory Committee, and is now the Chairman of the CWC, has been one of our most perceptive Advisors. He has helped us with a seasoned irrigation engineer's perception of the problem, and made many valuable suggestions on our draft chapters. We wish to record our personal gratitude to him.

Shri M.G. Padhye, who preceded Shri Chitale as Chairman, CWC, had read the second and parts of the third chapter and made useful comments and suggestions. The succeeding Chief Engineers of Irrigation, Pune Division, and the Executive Engineers, Nira and Pravara Irrigation Systems, as well the concerned Section Officers of the canals, readily made all information available to us, and helped in a variety of other ways. Our thanks are due to them.

By the time our survey was under way, we came in contact with Shri B.V. Dhamdhare, (the then) Director of the Water and Land Management Institute (set up by the Government of Maharashtra) at Aurangabad, and his colleagues in the faculty. This continuing contact has been of abiding benefit to us. Not only have we discussed various aspects of our study with Shri Dhamdhare and Prof. S.B. Varade, Professor of Agronomy in the Institute, but they have gone through the draft report and made many useful suggestions, particularly on technical matters, which we have been able to incorporate in this study. Our mutual discussions resulted in one of us taking up a part of a study relating to the Mula canal system which WALMI was then undertaking at the behest of CWC.

Another senior engineer who has gone through the draft report, and also discussed with us the nature and requirements of the Rotational Water Supply System and the crop pattern requirements, is Shri S.M. Lele, the then Administrator, Command Area Development Authority, Ahmednagar. We have learnt a lot from him, and we wish to record our deep appreciation of his help and advice.

We also record our thanks to the Economic and Statistical Adviser to the Ministry of Agriculture, Government of India, for permitting the Institute to copy out the detailed annual data relating to the crop costs and returns, based on the cost of production survey in Maharashtra every year since 1972-73. It placed valuable data of a type that it would not have been possible to collect in a single year, at our disposal.

It is not customary to thank colleagues in the Institute for all the help and assistance received. But we record our special thanks to Shri D. B. Sardesai for programming the tabulation and analysis of our voluminous data, and Shri S.M. Kulkarni for typing the report unhesitatingly, under pressure.

Needless to say that we alone are responsible for any errors that may remain.

This study owes its origin to the financial support of the Central Water Commission and we record our sincerest acknowledgement and thanks to the CWC.

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## A NOTE ON AGRICULTURAL PRODUCTION IN INDIA DURING 1955-78#

Nilakantha Rath\*

The purpose of this note is to examine the performance of agricultural production in India, in summary measures and see if there have been any noticeable changes in this during the last two and half decades. This would help us raise questions relating to the underlying factors responsible for such performance, and might permit a broad judgment about the overall production possibilities in the near future.

The summary measures have been arrived at by fitting exponential trend functions to the index numbers (with the triennium ending 1969-70 as base) of production (Table I), area (Table II) and yield rate (Table III) of the major crops grown in India, for the period 1949-50 to 1977-78.

A summary descriptive measure is helpful and therefore necessary to facilitate reading and interpretation of time-series data on production, etc. Difficulty, both in reading as well in arriving at a summary measure, arises because of the fluctuations in the data from year to year, caused by variations in uncontrollable factors like weather as well as in controlled factors like material inputs and labour. As long as the fluctuations in the

time-series data arising out of one or both these sources are within narrow limits, a trend line with a reasonably good fit would give a satisfactory summary description  $\hat{U}$  of the trend. If the fluctuations are not only frequent but also wide, then the trend would not give a good fit; nevertheless it may indicate if there is any underlying trend visible.

The real difficulty arises when such fluctuations are not regular and some are quite wide. Then the trend line fitted to the data can be improved if the few large deviations can be excluded before fitting the trend. The time-series on agricultural production, yield rate and area are plagued by this problem. We presume that the larger part of the year-to-year fluctuations in these time-series for any crop arises due to variations in the uncontrollable factor, weather. Such deviant observations can be eliminated by first fitting the trend line to the entire set of observations and then identifying the particularly deviant observations from the trend line for their exclusion. We have, however, for the present note, used our *a priori* judgment to omit particular observations from the time-series before fitting a trend line to it. Most of the observations excluded are the ones which

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Table I-Annual Compound Growth Rates of Production of Crops in India

Crop	Years				
	1949-50- 1977-78	1955-56- 1977-78	1955-56- 1964-65	1964-65- 1977-78	1964-65- 1977-78*
Rice	2.50	2.26 (2.44) <sup>c</sup>	3.58 (3- 39) <sup>ac</sup>	2.77	(2.41) <sup>c</sup> (3.17) <sup>b</sup>
Jowar	1.18	0.95 (1.63) <sup>c</sup>	3.22 (3.96) <sup>d</sup>	1.16	1.18 <sup>e</sup>
Bajra	2.44	2.53	2.84 (2.08) <sup>g</sup>	1.45	2.16 <sup>f</sup>
Maize	3.11	2.80	3.95 (3- 25) <sup>h</sup>	1.53	3.43 <sup>i</sup>
Ragi	1.64	1.11	1.21	3.56	1.87 <sup>j</sup> (3.90) <sup>k</sup> <sub>l</sub>
Small millets	-0.69	-0.66	-0.39	0.61	0.25 7.06n(11.66) <sup>o</sup>
Wheat	5.85	6.55	3.25 (3.86) <sup>m</sup>	8.31	(4.05) <sup>p</sup>
Barley	-0.09	-0.14	-1.50	0.03	-0.40 <sup>q</sup>
Cereals	2.92	2.91 (3.09) <sup>c</sup> -0.85	3.22 (3.02) <sup>c</sup>	3.59	3.16 <sup>s</sup> (3.27) <sup>o</sup>
Gram	0.28	0.13	-1.05	0.67	-0.39 <sup>r</sup>
Tur	-0.24	0.20	-2.15 (-0.58) <sup>c</sup>	1.05	0.31 <sup>t</sup>
Other pulses	0.39	-0.29	1.64 (0.98) <sup>c</sup>	0.42	
Total pulses	0.22		-0.24	0.64	
Foodgrains	2.56	2.49	2.70 (2.86) <sup>c</sup>	3.25	0.00 <sup>c</sup> 2.80 <sup>s</sup> 2.71 <sup>o</sup>
Groundnut	2.24	1.49 (2.44) <sup>c</sup>	3.92	1.35	0.56 <sup>u</sup> (1.00) <sup>c</sup>
Sesamum	0.13	0.63	1.29	0.07	
Rapeseed and mustard	3.21	3.25	4.10 (4.89) <sup>c</sup>	2.47	
Linseed	1.28	1.60	2.89	3.14	1.43 <sup>v</sup> (1.58) <sup>c</sup>
Castor seed	0.50	1.17 (1.84) <sup>c</sup>	-1.64	5.40	
Oilseeds	2.15	1.83 (2.48) <sup>c</sup>	3.21	1.75 (1.32) <sup>c</sup>	1.08 <sup>v</sup>

(Contd.)

- \* Excluding some years.  
(a) Dropping 1957-58, 1962-63.  
(b) From 1968-69 to 1977-78, dropping 1972-73, 1974-75, 1976-77. The growth rate for the years 1973-78 is 4.3 per cent.  
(c) Only peaks.  
(d) Excluding 1961-62, 1963-64.  
(e) Excluding 1965-67, 1970-74, 1975-76.  
(f) Excluding 1965-66, 1968-69, 1970-71, 1972-74, 1974-75, 1977-78.  
(g) Excluding 1956-57, 1960-61.  
(h) Excluding 1955-56.



- (i) Peaks only, excluding 1970-71.  
 (j) Excluding 1965-69, 1972-73.  
 (k) From 1969-70 to 1977-78, excluding 1972-74, 1976-77. The last seven years show a growth rate of 5- 11 per cent, taking only peaks.  
 (l) Excluding 1965-67, 1968-70, 1971-73, 1974-75, 1976-77.  
 (m) Excluding 1957-58, 1962-64.  
 (n) Excluding 1965-67, 1972-75.  
 (o) For the period 1964-65 to 1971-72, excluding 1965-67.  
 (p) For the period 1971-72 to 1977-78. Excluding the years 1972-75, the growth rate comes to 2.55 per cent.  
 (q) Excluding 1967-68, 1974-76.  
 (r) Excluding 1965-67, 1968-79, 1970-75.  
 (s) Excluding 1965-67, 1972-73, 1974-75, 1976-77.  
 (t) Excluding 1965-69, 1971-72, 1973-74, 1976-77.  
 (u) Excluding 1965-67, 1968-70, 1972-73, 1974-75, 1976-77.  
 (v) Excluding 1965-67, 1968-69, 1972-73, 1976-77.

Table I (Concl'd.)

Crop	Years				
	1949-50- 1977-78	1955-56- 1977-78	1955-56- 1964-65	1964-65- 1977-78	1964-65- 1977-78*
Cotton	2.52	1.73	3.15 (2.95) <sup>d</sup>	1.77	1.57 <sup>b</sup> (1.82) <sup>c</sup>
Jute	1.17	0.30	4.02	-0.04	
Mesta	2.30	-0.02		1.63	5.09 <sup>d</sup>
Fibres	2.18	1.34	3.42	1.34	0.85 <sup>b</sup> (0.76) <sup>c</sup>
Tea	2.44	2.71	2.50	3.19	3.72 <sup>e</sup>
Coffee	5.11	3.84	2.71	4.41	4.44 <sup>f</sup>
Rubber	9.52	10.55	7.28	10.22	-
Plantation crops	3.12	3.37	2.74	3.93	-
Pepper (Bl.)	0.04	-0.61	(-1.89) <sup>g</sup>	-	6.36 <sup>h</sup>
Chillies (dry)	1.45	1.23	3.51	0.77	
Ginger (dry)	4.39	5.37	4.07	7.79	
Condiments and spices	1.57	1.54	2.22	1.35	
Potatoes	5.50	6.23	5.93	6.43	
Fruits and vegetables	4.76	5.04	6.25	4.13	3.83 <sup>i</sup>
Sugarcane (gur)	3.45	3.08	4.69		5.12 <sup>j</sup>
		(3.44) <sup>c</sup>	(5.94) <sup>c</sup>	3.19	2.48 <sup>c</sup>
Tobacco	2.08	1.84	3.04 (2.20)	1.84	2.08 <sup>c</sup>
Non-foodgrains	2.71	2.43	3.45 (3.41) <sup>c</sup>	2.48 (2.01) <sup>c</sup>	2.73 <sup>k</sup>
All Crops	2.60	2.48 (2.59) <sup>c</sup>	2.95 (2.78) <sup>c</sup>	3.00	2.42 <sup>l</sup> 2.44 <sup>m</sup> (2.52) <sup>c</sup>

- \* After excluding some years.  
 (a) Excluding 1959-60.  
 (b) Excluding 1965-67, 1968-71, 1972-73, 1975-77.  
 (c) Peaks only  
 (d) For 1973-74 to 1977-78.  
 (e) For 1970-71 to 1977-78 only.  
 (f) Excluding 1966-68, 1969-73.  
 (g) From 1955-56 to 1972-73.  
 (h) From 1972-73 to 1977-78.  
 (i) From 1964-65 to 1970-71.  
 (j) From 1970-71 to 1977-78.  
 (k) For 1970-71 to 1977-78, excluding 1972-73 and 1976-77.  
 (l) Excluding 1965-67, 1972-73, 1976-77.  
 (m) From 1970-71 to 1977-78.

Table II-Annual Compound Rates of Growth of Area Under Crops in India

Crop	Years				
	1949-50- 1977-78	1955-56- 1977-78	1955-56- 1964-65	1964-65- 1977-78	1964-65- 1977-78*
Rice	1.01	0.92	1.67	0.78	0.67 <sup>a</sup> (0.90) <sup>b</sup>
Jowar	-0.05	-0.44	0.98	-1.25	-1.37 (-0.83) <sup>b</sup>
Bajra	0.60	0.26	0.05	-0.65	-0.85 <sup>c</sup>
Maize	2.39	2.22	2.60	1.46	1.81 <sup>d</sup>
Ragi	0.26	0.13	1.17	0.17	-
		(0.98) <sup>e</sup>			
Small millets	-0.39	-	-	-0.12	-
Wheat	2.81 (2.85) <sup>h</sup>	2.68	1.42	3.42 <sup>f</sup> (3.10) <sup>g</sup>	3.62 <sup>i</sup>
Barley	-1.20	-1.60	-2.10	-1.57	-
Cereals	0.97	0.81 (0.94) <sup>k</sup>	0.96	0.74	0.68 <sup>j</sup>
Gram	-0.37	-1.34	-0.81	-0.34	0.04 <sup>l</sup>
Tur	0.41	0.42	1.12	-0.05	
Other pulses	0.88	0.43	1.39	0.61	
Total pulses	0.42	-0.24	0.48	0.20	
Foodgrains	0.85	0.59 (0.71) <sup>n</sup>	0.86	0.61 <sup>m</sup>	
Groundnut	1.90	1.05	3.85	-0.44	
Sesamum	0.06	0.16	1.42	-1.23	-0.78 <sup>o</sup>
Rapeseed and mustard	1.91	1.50	3.45	1.29	1.26 <sup>p</sup>
Linseed	1.36	1.00	3.93	1.21	
Castor seed	-.0.63	0.40 <sup>q</sup>			
Oilseeds	1.32	0.82	2.84	0.00	

\* Omitting some years.

(a) Omitting 1965-67 and 1972-73.

(b) For 1970-71 to 1977-78.

(c) Excluding 1973-74.

(d) Excluding 1977-78.

(e) Only peaks.

(f) Excluding 1965-66.

(g) Excluding 1964-67.

(h) Peaks only.

(i) Peaks only.

(j) Excluding 1965-67, 1972-73, 1974-75, 1976-77.

(k) Peaks only.

(l) Excluding 1964-65.

(m) The same value of growth rate even if years 1965-67, 1972-73, 1974-75, 1976-77 are dropped.

(n) Peaks only.

(o) From 1968-69 to 1977-78.

(p) Begins from 1963-64 and excludes 1964-66, 1968-69 and 1976-77.

(q) From 1957-58.

Table II (Concl'd.)

Crop	Years				
	1949-50- 1977-78	1955-56- 1977-78	1955-56- 1964-65	1964-65- 1977-78	1964-65- 1977-78*
Cotton	0.60	-0.33	-0.76 (0.36) <sup>a</sup>	-0.22	
Jute	0.72	-0.22	2.43	-0.88	0.48 <sup>b</sup>
Mesta	2.11	0.45	4.95	0.18	
Fibres	0.60	-	0.53	-0.78	-0.62 <sup>c</sup>
Tea	0.80	-	0.55	0.72	0.61 <sup>d</sup>
Coffee	2.64	-	(2.46) <sup>e</sup>	3.27	
Rubber	7.43	-	(8.98) <sup>f</sup>	-	4.96 <sup>g</sup>
Plantation crops	2.40	-	(2.39) <sup>h</sup>	2.19	-
Pepper (BL)	0.88	0.43	1.84	0.00	-
Chillies (dry)	1.16	0.99	(1.58) <sup>i</sup>	-	0.39 <sup>j</sup>
Ginger (dry)	1.25	1.65	3.47	1.40	0.99 <sup>k</sup>
Condiments and spices	1.64	1.65	1.84	1.54	1.59 <sup>l</sup>
Potatoes	4.01	3.89	4.79	3.49	3.52 <sup>m</sup>
Fruits and vegetables	3.55	3.25	4.03	2.47	2.55 <sup>n</sup>
Sugarcane (gur)	2.27	1.85	3.03 (4.10) <sup>o</sup>	1.69	1.05 <sup>p</sup>
Tobacco	0.88	0.43	0.73	0.26	0.87 <sup>q</sup>
Non-foodgrains	1.40	0.93	1.86	0.67	0.64 <sup>r</sup>
All Crops	0.96	0.67	1.08	0.64	0.63 <sup>s</sup>

- \* Omitting some years.  
 (a) Excluding 1959-61, 1962-63.  
 (b) For years 1969-70 to 1977-78, excluding 1973-77.  
 (c) From 1969-70 to 1977-78, excluding 1973-77.  
 (d) Excluding 1964-65.  
 (e) For years 1949-50 to 1964-65.  
 (f) For years 1949-50 to 1965-66.  
 (g) From 1965-66 to 1977-78.  
 (h) For years 1949-50 to 1964-65.  
 (i) Excluding 1964-65.  
 (j) Including 1963-64.  
 (k) Excluding years 1967-71.  
 (l) Excluding years 1968-69, 1969-70, 1972-73, 1974-75.  
 (m) Excluding years 1968-69 and 1970-71.  
 (n) Excluding years 1969-73.  
 (o) Including 1965-66, but excluding 1962-64.  
 (p) Excluding years 1966-69, 1970-73, 1975-76.  
 (q) Excluding 1965-66, 1974-77.  
 (r) Excluding 1968-69, 1972-73.  
 (s) Excluding 1965-67, 1968-69, 1972-73, 1974-75, 1976-77.

Table III-Annual Compound Growth Rates of Per Hectare Yield Rates of Crops Grown in India

Crop	Years				
	1949-50- 1977-78	1955-56- 1977-78	1955-56- 1964-65	1964-65- 1977-78	1964-65- 1977-78*
Rice	1.48	(1.43) <sup>c</sup>	1.93 (1.79) <sup>c</sup>	1.97	1.76 <sup>a</sup> (1.58) <sup>c</sup>
Jowar	1.23	1.40	2.22 (3.06) <sup>c</sup>	2.44	(0.85) <sup>b</sup> (3.42) <sup>d</sup>
Bajra	1.82	2.25 (2.78) <sup>c</sup>	2.78 (2.42) <sup>c</sup>	2.09	(0.14) <sup>b</sup> (7.53) <sup>d</sup>
Maize	0.71	0.58	1.31 (1.28) <sup>c</sup>	0.08 (1.30) <sup>c</sup>	
Ragi	1.38	0.98	0.04	3.40	(6.57) <sup>e</sup>
Small millets	-0.32	-0.22	0.76	0.73	(0.00) <sup>f</sup>
Wheat	2.95	3.75	2.23 (2.86) <sup>c</sup>	4.04 (3.55) <sup>c</sup>	(6.02) <sup>g</sup> (2.81) <sup>h</sup>
Barley	1.11	1.46	0.60 (1.65) <sup>i</sup>	1.57	(1.39) <sup>c</sup>
Cereals	1.66	1.76 (1.90) <sup>c</sup>	1.93 (2.14) <sup>c</sup>	2.34 (2.03) <sup>c</sup>	
Foodgrains	1.43	1.55	1.55 (1.89) <sup>c</sup>	2.15	1.75 <sup>a</sup>
Groundnut	0.34	0.44	0.06 (0.76) <sup>c</sup>	1.78	(0.62) <sup>c</sup>
Oilseeds	0.44	0.62	0.24 (1.28) <sup>c</sup>	1.40	(0.72) <sup>j</sup> (0.98) <sup>c</sup>
Cotton	1.90	2.07	2.94 (3.01) <sup>k</sup>	2.55	(2.03) <sup>l</sup>
Sugarcane	1.15	1.21	1.62 (2.06) <sup>m</sup>	1.46	(1.03) <sup>n</sup>
Non-foodgrains	0.88	0.94	1.40	1.23	(0.92) <sup>o</sup>
All crops	1.28	1.36 (1.44)	1.59 (1.91) <sup>c</sup>	1.81	(1.47) <sup>c</sup>

- \* Excluding some years.  
 (a) Excluding 1965-67, 1972-73, 1974-75, 1976-77.  
 (b) For 1964-65 to 1973-74, peaks only.  
 (c) Only peaks.  
 (d) For 1973-74 to 1977-78, peaks only.  
 (e) For 1973-74 to 1977-78, excluding 1976-77.  
 (f) Excluding 1965-67.  
 (g) For 1964-65 to 1971-72, peaks only.  
 (h) For 1974-78.  
 (i) Excluding 1962-64.  
 (j) Excluding 1965-67, 1968-69, 1972-73, 1976-77.  
 (k) Excluding 1950-51, 1961-62.  
 (l) Excluding 1965-67, 1970-71, 1972-73.  
 (m) Excluding 1961-63, peaks only.  
 (n) Excluding 1965-67.  
 (o) For 1970-71 to 1977-78, excluding 1972-73.

appeared to be lower due to adverse weather, though there are a few cases of very high index numbers which have been omitted because they were very unusual or suspect. The trend lines fitted to such adjusted time-series would give growth rates of production, etc., influenced by more stable factors operating on the crop economy during the period.

In one's effort to isolate the weather factor affecting production, yield rate or even area under a crop, some measures of the weather variable have been tried out in past studies as explanatory factors in regression models. Most of them fail to serve the purpose. The only way to do so is to specify the nature of the weather variables after ascertaining these from proper agronomic experiments under uniform controlled inputs, in a number of years. Even when such specifications are available, they will be weather- and soil-specific. Aggregation of these variables for different soil-climate complexes for studying any particular crop is difficult.

If one is interested in knowing the production potential observed during a given period, by minimizing the adverse influence of weather, it may be useful to take only the peak levels recorded and fit a trend line to this. It cannot entirely eliminate the weather variable. But, since

it may be fair to expect the other inputs like irrigation, fertilizer and new seeds not to change substantially from one year to the next, the trend line fitted to the peaks may give us a growth rate of the yield rate or production, where the adverse effect of weather has been minimized. If in a time-series such peaks are many, then the trend fitted to them would also give a better indication of the actual underlying trend during the period under reference. But we find that in some instances such peaks are only 3 or 4 in say 13 years. A growth rate calculated on the basis of these few observations can only give an indication of the change in the production or yield potential observed during the period.

The other relevant question is the functional form used for fitting a trend: whether a straight line or an exponential, or some other type. Naturally, the best-fitting line should be chosen. However, it is possible that one or the other fit turns out to be equally good. Under such circumstance, one has to decide a priori which particular function to choose; statistics cannot help further. One may think that in a biological production process like agriculture a compound growth rate is the more appropriate.

The official all-India indices of production, area and yield rates for the important crops (based on the triennium

ending 1969-70) are available for the period 1949-50 to 1977-78. For our purposes, however, we confine attention to the period 1955-56 to 1977-78, and exclude the years 1949-50 to 1954-55 from our detailed examination. We have reason to believe that despite official efforts in the past, the available indices of area, yield and production for these years are still plagued by purely statistical differences arising out of changes in reporting area and methods of estimating yield. This does not of course mean that the indices from 1955-56 onwards are entirely free from such defects. But these are present, if at all, to a much smaller extent, and are therefore ignored in our exercise.

We divide the entire period of 23 years, from 1955-56 to 1977-78 into two: from 1955-56 to 1964-65, and from 1964-65 to 1977-78. 1964-65 was the last good crop year before the introduction of the new high-yielding variety (HYV) of seeds, and therefore provides a useful point of division of the entire period into two.

The total agricultural production of India grew at an average rate of 2.48 per cent per year during the 23 years 1955-56 to 1977-78; if we take only the peak years, it is 2.59 per cent. The rate of growth was somewhat higher, 2.95 per cent, during the ten years ending 1964-65, than during

the subsequent 13 years, when it was only about 2.42 per cent (after dropping a few years of poor crop production). The growth rates of the peak levels of production also show the same type of difference—2.78 and 2.52 per cent.

During the decade ending 1964-65 the growth rate of production of non-foodgrain crops was higher (3.46 per cent) than of foodgrains (2.70 per cent). The growth rates of the peak levels also show this difference. In the post-1964-65 years, however, the position was reversed; while the overall rate of growth of foodgrains was maintained or marginally improved (2.8 per cent, after dropping some poor crop years), the growth rate of non-foodgrain production declined (to 2.48 per cent; the growth rate of peaks only from 3.41 to 2.01 per cent). Non-foodgrains' includes plantation crops like tea, coffee and rubber, of whose production growth rate was higher in the post-1965 period; if these are excluded, the growth rate of all other non-foodgrain crops would be even lower in the second period. Thus, the overall growth rate of agricultural production was lower in the years after 1964-65, mainly because the production of non-foodgrains failed to keep up during these years.

The sustained growth of foodgrains production during the 23-year period was due entirely to the cereals. Pulses as a group showed no increasing trend in production, if we ignore the negative growth rates, because most of these trends were statistically insignificant. It is necessary to note that while the area under pulses as a group showed a positive growth rate during 1955-65, the total production remained generally unchanged or even declined somewhat, entirely due to the decline in the rate of per acre yields. Since most other crops did not record any decline in yield rates, we suspect that at least a part, if not all, of this decline in pulses was statistical and not real. Pulses, other than gram, had much higher growth rates in yield during the period 1949-55 and declined subsequently. We suspect that this was more likely due to changes in the method of estimation in yield of these crops in later years, though other possible reasons cannot be ruled out.

The growth rate of production of cereals was 3.22 per cent during the ten years before 1965, and was about the same (3.16 per cent after excluding some poor crop years) in the post-1965 period. (The same was the case with the growth rates for peaks only.) The individual cereals, however, exhibited different trends during the two periods.

In the decade ending 1964-65, all cereals, except barley and small millets, showed positive growth rates. Barley and small millets have steadily been declining over the years. While the yield rate of small millets has not changed significantly over the years, its area has shown a slight declining trend. The production of barely has declined, despite a significant positive growth rate in yield per hectare, because of a steady decline in the area under the crop.

The major cereals, rice, wheat, millets (jowar and bajra) and maize registered a growth rate of more than 3 per cent during the decade ending 1964-65: Wheat and jowar recorded a rate of about 3.9 per cent (excluding a couple of bad years), rice 3.4 per cent and maize 3.25 per cent. About half of the growth rate of rice production was due to an increase in the area under the crop; in the case of wheat, area accounted for a little over one-third; in the case of maize it accounted for more than half. In the case of the two millets, however, the bulk of the increase in production was accounted for by the increase in per hectare yield rates. *Ragi* showed a much lower rate of growth of production, 1.21 per cent, almost all of it due to an increase in the area under the crop.

In the post-1965 period, with the advent of the new HYVs the pattern changed. The only cereals which have been able to keep up or improve upon their past performance are wheat and ragi; if we consider the peaks only, then maize also. The growth rate of wheat production almost doubled during this period-to 7.06 per cent (excluding bad years). Of this, about half was due to an increase in the yield rate and the other half due to an increase in the area. Wheat has gained in area not only due to expansion of irrigation in the *rabi* season, but also at the cost of crops like barley, gram and even in places, cotton; maize has gained in both area and yield rate. The performance of *ragi* has been very significant, and it has been entirely due to great improvement in yield rates; the entire development has, however, been during the seventies. We shall return briefly to this later.

Growth in production of rice and the major millets, however, has not been able to keep up the earlier rates. The growth rate of rice declined to 2.77 per cent in the post-1965 period. (The growth rate of peaks declined from 3.39 to 2.41 per cent.) Even if we take the period 1968-69 to 1977-78 (after excluding a few poor crop years) the growth rate of rice was 3.17 per cent. Jowar's growth rate came down to about 1.18 per cent, and that of bajra to about 2 per cent after excluding

a number of poor crop years. Almost the entire increase was due to an increase in the yield rate; area did not increase, or showed a slight declining trend. Thus the unchanged growth rate of cereals during the years since 1964-65 has been the result largely of the great increase in wheat production, supported by *ragi* and maize.

Turning to non-foodgrains, one finds a decline in the growth rate of all oilseeds except castor, of all fibres except mesta, of all condiments and spices except ginger, of sugarcane, tobacco, and fruits and vegetables. Only plantation crops, mesta, ginger, castor seed and potato recorded increasing trends. The increasing trends in production have been largely due to modest increases in per acre yields, whose rates of growth have, in most instances, been lower than in the earlier decade. The area under oilseeds and fibres showed no upward trend. In the case of a few non-foodgrain crops which showed a higher growth rate of production in the post-1965 period the increase was due both to an increase in area and yield rate, except for crops like ginger which was largely due to expansion of area.

The result of these differential growth rates between cereals and other crops has been a somewhat greater rate of increase in the area under cereals than under other



crops. It implies that cereals and a few other non-foodgrain crops, like ginger, potato, sugarcane, etc., have attracted not only a larger proportion of the new area under crops, but also land from under other crops, during the post-1965 period. The growth rates of per hectare yields of most non-cereal crops have been lower during the later period. It shows what possibly would have happened to the major cereals in the absence of the new hybrid and HYVs.

A further feature of agricultural production that becomes apparent on carefully looking at the series of index numbers is that the general performance of agricultural production and yield rates was poorer during the period 1964-65 to 1970-71, and improved during the seventies. Indeed, during the five years 1973-74 to 1977-78, the indices for many crops not only persisted at a high level rarely recorded in the previous ten years or so, but also some crops recorded rapid increase in it. Rice production recorded for the first time a growth rate of more than 4.2 per cent. The growth rates of jowar and bajra production also sharply improved from the level of near stagnancy or slow increase. *Ragi* which had showed a sluggish trend during the sixties, showed a rapid growth in the seventies. The same was true of some non-foodgrain crops. In the case of all these crops the major reason for rising

production was increasing per acre yields. It is very likely that favourable weather conditions during most of these years were responsible for the sustained high level of production and yields. The high rate of growth in yield rate and production can, however, be only due to extension of irrigation and/or high-yielding seeds and other associated inputs, some of which might have been possible due to persistent favourable weather. Rice production and yield have recorded very significant growth rates in the Punjab and Haryana; it has also increased for the autumn, winter or summer crop in many States of the Union. This could only be due not only to extension of irrigation, but also to the greater use of the new seeds and fertilizers even without irrigation. The same appears to have happened with the major millets, where the hybrids had either not worked or failed due to pests and diseases. We do not know what accounts for the rapid growth in the yield rate of *ragi*.

With all this significant increase in production during the last five years, the growth rate of cereal production has not been greater than 4 per cent. For, not all cereals have shown this trend. Wheat production which had increased at the rate of about 11 per cent during 1964-72, the early years of the new seed, registered only a 4 per cent growth rate during the seventies; its per hectare yield increased

at only 2.8 per cent during the seventies as against 6.57 per cent during 1964-72. This is not surprising: high-yielding wheat had already reached very large areas of the wheat region and the economically high levels of yield had been fast approached. This should not be considered unusual, but natural.

Indeed, this example of the lowered growth rate of wheat when rice and millets seem to be picking up reminds us of the difficulty of sustaining a much higher growth rate of cereal or total agricultural

production than has been possible in the past. We see that total agricultural production has not exceeded 3 per cent rate of growth, and cereals have not reached 3.5 per cent over a period of a decade. It is too optimistic to expect persistently favourable weather for extended periods. Therefore, a very much better than a 3 per cent rate of growth in the case of all agricultural production and 3.5 per cent rate for cereals appear to be an extremely difficult possibility in the foreseeable future.

# PRICES, COSTS OF PRODUCTION AND TERMS OF TRADE OF INDIAN AGRICULTURE\*

Nilakantha Rath†

I am very thankful to the members of the Indian Society of Agricultural Economics for doing me the honour of electing me to preside over this Annual Conference of the Society. I am fully conscious of the generosity and appreciation shown by fellow members to a loyal old member of the Society, which is the premier representative, body of scholars of agricultural economics in India. I shall try to justify your affection and trust to the best of my ability.

This meeting of the Society happily coincides with the Twenty-fifth anniversary of the Agro-Economic Research Centre of the Sardar Patel University, our hosts. This Agro-Economic Research Centre is one of a chain of such Centres, established with the full financial assistance of the Ministry of Agriculture of the Government of India, in different Universities and research institutions in the country. These Centres are standing testimony to the excellent co-operation between the Government and the Universities in promoting research into the problems of India's agricultural

economy. The Agro-Economic Research Centres, in addition to the Agricultural Universities, have made a significant contribution to our understanding of the forces shaping the rural economy and the impact of various policy measures in the field. The Centre at Vallabh Vidyanagar, under able leadership, both past and present to has contributed very effectively to research as well as training of researchers in agricultural economics. I take this opportunity to join you all in wishing the Centre even more active and fruitful contributions to the study of the Indian rural economy in the years to come.

In recent years considerable body of public opinion, including political, academic, as well as farmers', has expressed distress at what is characterized as unfair treatment to the agricultural sector in the economy over the years. This is other than the concern with poverty in rural India. It is concerned with the total farm sector. The leaders of farmers' organizations have tried to highlight this by

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I wish to record my thanks to the Economic and Statistical Adviser to the Ministry of Agriculture, Government of India, for making available to me the unpublished data on Farm Harvest Prices and the Costs of Production of Crops, obtained through the annual surveys. I also wish to thank Ms. Nishita Pradhan for great help with all the calculations. This essay is based on a part of the research work being funded by the University Grants Commission.

drawing a distinction between 'India' and 'Bharat', the former referring to the urban sector and the latter to the rural.

At a sectoral aggregate level there appears justification in this distinction between 'India' and 'Bharat'. The total real Net National Product (NNP) of India, (*i.e.*, approximately the National Income) increased at an average compound rate of about 3.5 per cent during the last 30 years. During the same period, the total population grew at the rate of about 2.2 per cent, giving a growth rate of about 1.3 per cent in the real per capita income. In contrast to this picture for the total economy, the picture for the agricultural sector is characterized by stagnancy of income at the per capita level. While the total NNP in the agricultural sector increased at about 2.2 per cent a year during the last three decades, the proportion of the total population dependent on agriculture for its living remained unchanged at 70 per cent, and therefore recorded the same rate of growth as the total population, leaving the average real per capita income of the people in agriculture unchanged over tilt years. It is obvious that the real increase was in the non-agricultural sector, essentially urban.

Of course, every one realises that these are sectoral averages, and in each sector there were households which had done better than the average and others who had fared worse. In regard to the agricultural sector, two rather sharply opposite views have been presented.<sup>1</sup> One view is that during the last two decades in particular, the cultivator sub-sector of the agricultural sector, consisting of cultivators who have surplus produce to sell, has been able to improve its income position through favourable terms of trade. These benefits; however, have not reached the other sub-sector consisting of marginal farmers and landless labourers. The representatives of farmers' organizations as well as some others, have, on the other hand, maintained that the farm sector has been receiving a raw deal, the terms of trade have moved against the cultivators and therefore their real income situation has, by and large, deteriorated or at best stood unchanged, and the non-agricultural sector has been having it good at the cost of the agricultural sector. If the cultivators are badly off, they say, their labourers cannot be better off. Their approach to the improvement in the farmers' income

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1. See, for example, Ashok Mitra: *Terms of Trade and Class Relations*, Frank Cass and Co., Ltd., London, 1977. R. Thamarajakshi, "Intersectoral Terms of Trade and Marketed Surplus of Agricultural Produce, 1951-52-1965-66", *Economic and Political Weekly*, Vol. IV, No. 26, June 28, 1969, and "Role of Price incentives in Stimulating Agricultural Production in a Developing Economy", in D. Ensminger (Ed.): *Food Enough or Starvation for Millions*, Tata McGraw-Hill, New Delhi, 1977. A. S. Kahlon and D. S. Tyagi, "Inter-Sectoral Terms of Trade", *Economic and Political Weekly*, Vol. XV, No. 52, December 27, 1980.

position is mainly through improvement in their terms of trade. This, they consider, can be achieved by the State fixing prices of different farm products on the basis of their costs of production every year, which would also provide incentive to greater farm production. They contend that the Agricultural Prices Commission (APC) does not determine the support prices of farm products strictly on the basis of cost of production. What is more, the way the cost of production is computed has flaws that adversely affect the interest of the farmers.

Sometimes the advocacy has indeed gone further.<sup>2</sup> It is contended that it is not enough to fix prices on the basis of the cost of production. The prices should be fixed as high as possible (depending on the price elasticity of demand), so that the total sales revenue should be the maximum. The possibility of excess production and accumulation of stocks in such circumstance can be avoided by fixing output quota for individual producers. In effect, it is suggested that the state should operate a cartel for every type of farm produce. This would ensure the highest possible income to the farmers, *i.e.*, 'Bharat', and thereby improve parity with 'India'.

It would be useful to examine the question of fixation of price on the basis of cost of production, and then turn attention to the trend in terms of trade of agriculture during the last two decades.

In India one finds a strong appeal among not only farmers' representatives but many others for the feeling that the price of farm product must cover its cost of production and that the state should ensure a fair price to the farmer by fixing the price of the produce to cover the cost of production. The student of economics can react to this by simply saying that price of a commodity is determined by forces of supply and demand, and to fix the price on the basis of cost of production, which underlies supply, without reference to demand, is sure to give rise to the, chronic problem of surplus. It is, however, not very helpful to dispose of the matter in such summary fashion. During the last two decades students have tried to point out the pitfalls and defects in this rather simplistic approach to price determination.<sup>3</sup> I shall try to summarise these here.

Since most agricultural farms are multi-product enterprises, calculation of the cost of production of a particular

2. Sharad Joshi: *Bharatiya Shetichi Paradinata* (in Marathi), recorded by Suresh Ghate, Shetkari Prakashan, Alibag (Maharashtra), 1982, p. 26.

3. Nilakantha Rath, "On Fixation of Price in Agriculture on the Basis of Cost of Production", *Artha Vijnana*, Vol. 7, No. 4, December 1965, and *Artha Vikas*, Vol. 2, No. 1, January 1966. M.L. Dantwala, "Agricultural Price Policy", *The Economic Times*, February 7, 1981. M. K. Bennett: *Farm Cost Studies in the United States*, Food Research Institute, Stanford, 1928.

product on the farm involves not only the ascertaining of actual purchase or paid-out costs of specific current inputs, but also apportionment of any common cost incurred at the farm level for different products. This requires collection of data of particular sort that is not always readily available. More importantly, if the input is in the nature of a capital equipment, calculation of its depreciation involves all the problems raised by economists about the use of historical values of assets for the purpose. While the economic logic is clear, there are no foolproof empirical methods of applying these. A serious matter in this context is the valuation of the services of land. The farmers' spokesmen have often contended that the cost of land services in the cost of production of crops has been under-valued, and that the going price of the particular type of land should be taken as a basis for valuing the service of land in calculating the cost of production of the crop. Apart from the difficulty of estimating the possible market price of any piece of farm land where very little actual sale purchase transaction takes place in the locality in a year, it is pointed out that land value in India is high partly because of the sense of security and prestige associated with the-possession of land. Therefore, it would be improper to attribute this unascertained value of the service of land to the cost of production of a crop grown on that land. Nor is the basis of the total

allocation of the annual cost of land among the different crops grown on it during a year, very clear. But most important of all is the old economic knowledge that the return to the services of a fixed factor (or factor in short supply), like land, depends on the price of the produce it helps to produce, and not vice versa. Raising the price of a farm produce by attributing a higher value to land may only result in a further rise in land value next year, leading to further rise in price, and so on. The price rise will be reflected essentially in rising rental. The allocation of costs also becomes problematic when the same land grows mixed crops in the same season, or where a crop has important marketable by-products. Empirically there are no satisfactory ways of dealing with these problems.

Besides allocation of costs, difficulties arise in the valuation of inputs not purchased in the market but supplied by the farm households. Valuation of the farm household labour is the most important of these in the Indian context. While current method of valuation of such labour involves an attempt at estimating its opportunity cost, one may suspect that even this in many situations might be an overestimate. Most of farm management studies in India during the last three decades have shown that a significant proportion of farmers, particularly the small and even medium farmers, were

incurring loss, often repeatedly in three consecutive years, when all costs, including land and family labour costs (the so-called Cost C), are deducted from the gross value of output. Since land and family labour are the two major items for which the value is imputed, and since many feel that the land cost is undervalued, one comes to the conclusion that family labour in this situation does not really earn what is attributed to it as its opportunity cost. The costs that are presently being attributed as opportunity cost, therefore, are more in the nature of normative wage rates. Moreover, it is conceivable that the opportunity cost of family labour may not be the same at all times of the year. All these go to indicate the many empirical difficulties and shortcomings in estimating the cost of production of any crop grown by a farmer in any year.

The matter of using cost data for price fixation becomes even more problematic when we notice that different farmers have different costs (however estimated) per unit of output, and that there is no single 'the' cost of production. Indeed, the farm cost data reveal a wide range of costs per unit of output over which farmers, even in a limited group of villages, are distributed. Which cost of production should then provide the basis for price fixation? The average cost has no particular merit; it does not cover the

cost of the same proportion of farmers, or of land under the crop, or of the total produce in any year; and it leaves more or less half of these uncovered. Recognition of this led some in the U. S. A. in the twenties and in India during the last two decades to advocate what is called the 'bulk-line cost' approach to price determination. It simply means that the price should be fixed at such a level as would cover the unit cost of production of the bulk of the output, that bulk being put at 85 per cent of the total produce. There is no justification for this particular percentage, except that it excludes some who presumably are 'inefficient' producers or had accidentally high cost. The arbitrariness of such a cut-off point apart, the real trouble 'with fixation of price with either an average or a bulk-line cost is that it completely neglects the unavoidably important considerations of inter-crop and inter-regional relative prices. Even a cursory look at cost data, crop and regionwise, will show what unintended havoc this approach can play with relative prices and their consequences. Fixation of prices on the basis of cost of production (however defined) might lead to wide differences in regional prices of a crop, completely unrelated to costs of transport from one region to the other. The differences in prices of competing crops even in the same region may lead to great shortages and surpluses of different crops.

Besides the conceptual, empirical and policy implications of the suggestion for fixation of farm product price on the basis of its cost of production, there are operational difficulties as well. The price fixed by the Government, in order to be effective, must be announced before the crop arrives in the market, *i.e.*, some time early in the harvesting season. Now, it is inconceivable that the cost of production data for the current season, collected from the farmers, along with yield estimates, can be processed and made available to the price fixing authority in time for fixation of price on its basis before marketing starts. It is common knowledge that the cost data based on cost of production surveys during the last ten years become available to the price fixing agency with almost a two year lag, despite the use of computers. But what is more, it has been rightly argued that if the price fixed by the state is to affect the decision of the farmer, it must be announced before the sowing of the crop, and not before its marketing. That, however, rules out the possibility of fixing the price on the basis of the actual cost of production. Any other method of estimating possible cost will be conjectural and hence subject to varying degrees of error.

In view of all this, it is no wonder that neither the APC in India during the last two decades of its existence, nor any other country I am aware of, has been able to fix the price of any farm product on the basis of its actual cost of production. The APC merely states that it takes, among other things, costs of production into account in fixing price, presumably because it thinks it can do no better.

An alternative approach that has been widely used in the western world for fixing support price by the state for farm products is the fixation of price of produce at such level as would maintain a certain parity between prices received and prices paid by the farmers. While this approach is followed in order to protect the farmer's real income position, it can also be useful as a price support measure for purposes of production and supply. Scholars in India have tried to compute inter-sectoral commodity terms of trade for agriculture in order to ascertain if the prices received by the farmers were relatively higher or lower than the prices paid by them to the non-farm sector on farm and household account. These exercises,<sup>4</sup> with their limitations of method and data, have been at the all-India level for the entire agricultural

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4. Thamarajakshi, *op. cit.* A. S. Kahlon and D. S. Tyagi: Agricultural Price Policy in India, Allied Publishers Pvt. Ltd., Bombay, 1983. A. S. Kahlon and M. V. George: Agricultural Marketing and Price Policies, Allied Publishers Pvt. Ltd., Bombay, 1985. K. Subbarao, "Farm Prices: A Survey of the Debate", Institute of Economic Growth, Delhi, 1984 (mimeo.).



sector, sometimes consisting also of plantations like tea, etc., and the forest sector which is mainly in the public sector. While they are of use in understanding the country-wide changes in the terms of trade of the agricultural sector, they naturally smother the differences among regions and major crops in this regard. In the context of differential rates of agricultural development not only in different regions but also of different crops, it would be useful to know how terms of trade have changed for different crops in different regions, if one is to have a clearer understanding of the forces operating on production and income distribution in the farm sector. I, therefore, propose to make a modest attempt in this direction within the limitations of the information available to me.

I propose to examine the changing terms of trade of the major crops in the different States for which the relevant data are available for the last two and half decades. For prices received the data used are the farm harvest prices of individual crops in the State concerned. It may be argued that the farm harvest price may not be the best indicator of the price received by the farmer, since most large farmers sell the bulk of the produce not soon after harvest but much later, in the lean season preceding the next harvest. This point was checked by comparing the index of the farm harvest price of a

particular crop with the wholesale price index of that crop in the last four months before the next harvest, during the period 1961-80. (These data and graphs are not presented here to save space.) It was found that there was no evidence to believe that the index of the wholesale price of a crop in the lean season had increased faster than the index of its farm harvest price during the period; in some years there was a slightly higher increase in the case of some crops, in other years the rise was lower. Therefore, there is no harm in using the index of farm harvest prices as the measure of prices received by farmers.

Prices paid by the farmers are of two types ^W the prices of the farm inputs purchased from the non-farm sector, and prices of household consumption items purchased from the non-farm sector. (Normally, inter-sectoral terms of trade are calculated for the farm sector as a whole. I have chosen to compute such terms of trade for individual crops, with all its limitations, because the problems of different regions, even for the same crop, as well as of the different crops, are not the same.) The farm inputs purchased from the non-farm sector consist of five items listed in the farm cost surveys conducted under the aegis of the Ministry of Agriculture: fertilizers; insecticides; electricity, diesel and flow irrigation water; farm machinery and equipment

and their repair as well as farm building. We have used the all-India wholesale price of fertilizer, insecticide, diesel oil, electricity and non-electrical machinery, prepared by the office of the Economic Adviser, as indicative of the prices of the farm inputs purchased from the non-farm sector. In order to arrive at a weighted average price index of all these inputs, we used the percentages of the expenditure on these inputs to their total expenditure for a particular crop in a particular State, as weights. These expenditure data are obtained from the cost of production surveys conducted by the Ministry of Agriculture in various States during the years 1972-83. Where such cost data for a crop were available for a number of years, it was noticed that in most cases the year to year variation in their percentage distribution was rather small. Therefore, we have taken the average percentages for the different years as weights. Naturally, this composite price paid index for farm inputs could be computed only for such crops and States for which the cost of production data were available.

As for the prices paid index for farm household consumption items purchased from the non-farm sector, the basic items for the rural population for each State and their weights were taken from the 17th Round of the National Sample Survey (NSS), 1961-62. (It would have been

preferable to use such data relating to a later period, say the seventies, if they were available to us.) The items included are: Vanaspati, all edible Oils, sugar and gur, tea and coffee, tobacco products, intoxicants, kerosene, cotton, woollen and silk cloth and readymade wear, bedding, medicine, soap and utensils. Items like shoes, transport, consumer durable could not be considered since their price indices were not available for the whole or part of the period. However, these exclusions may not make a significant difference to the prices paid index in view of their weight in the overall per capita expenditure in most States. The price indices used for these commodities are the all-India whole-sale prices. (Regional rural retail price indices would have been better, if available.)

It is, however, not practicable to combine these two composite indices of prices paid, one for purchased inputs and the other for purchased items of household consumption, when the terms of trade index is for an individual crop. We shall, therefore, perforce use these two indices separately to deflate the index of farm harvest price of a particular crop and try to read them together, a rather clumsy job indeed.

The terms of trade index (or the parity index) requires that one refers to a year (or period) during which the relative price

position was considered satisfactory from the farmers' and others' point of view. The effort is then to maintain this parity or terms of trade, in order to protect the farmer's real income position, as also incentive for production. It may be difficult to find a single year or even a 2-3 year period during the last 20-25 years which might satisfy this requirement for all crops in all States. We have chosen 1961-62 as the base year for our purpose, since the beginning of the sixties was a generally satisfactory period for agriculture. However, choice of a different year or period during the years 1961-83, can be made and the indices appropriately recalculated (of course, with the same weights) from our tables, if preferred. For computing the terms of trade with respect to the input prices, the prices index of the output of a year, say 1962-63, is divided by the composite input price index for the financial year 1962-63. For the terms of trade index with reference to household consumption goods purchased from the non-farm sector, the price received index of, say 1962-63, is divided by the composite price paid index of 1963, and so on, and the 1961-62 terms of trade index equated to 100. The data are presented in Tables I and II.

Examination of the terms of trade index with respect to input prices, for as

many crops and States for which the relevant data were available (Table I), shows the following trends:

(i) The index for all crops (except jute) in all States showed a high level, till 1974-75. The indices reached peak high levels around 1967-69, declined somewhat around 1970-72, and then increased till 1974-75. But never did the indices come down to the level of the early sixties during these 15 years.

(ii) From 1975-76 till 1982-83 (the latest year for which farm harvest price data are available to us) there was a visible decline in the terms of trade index. However, all crops do not show the same trend. The index for cereals, *i.e.*, rice, wheat, jowar, bajra, ragi and barley showed a downward trend. The millets and ragi in most States in most years, and particularly in the years of the eighties showed an index lower than 100, meaning thereby that the commodity terms of trade index had become distinctly unfavourable to these crops compared to the early sixties. The index for rice became distinctly unfavourable in the eighties (1980-83) in all States, while in some States like Punjab, Bihar and Assam it was so since 1976-77. Similarly, the index for wheat showed that the terms of trade for farmers since 1975-76 had fluctuated around 100, but became distinctly unfavourable in the eighties.

(iii) As against the cereals, the pulses, and cash crops like oilseeds, sugarcane and cotton did not exhibit unfavourable terms of trade. Indeed the index, though fluctuating over the years, remained considerably above 100 for gram and groundnut, indicative of the position in regard to pulses and oilseeds in general. So was the position with regard to sugarcane. In regard to cotton, the index came almost to the level of the sixties in a few States like Karnataka and Haryana in the late seventies and early eighties, but never showed a distinctly persistent unfavourable terms of trade.

(iv) The one crop showing very distinctly unfavourable terms of trade is jute. Its harvest price has highly fluctuated from year to year. But for most of the years since 1961-62, the terms of trade index has been below that of the base year. The situation was persistently unfavourable in the seventies and declined further during the early eighties.

Before drawing conclusions about the changing pattern of terms of trade, it is necessary to turn our attention to the other part of the terms of trade, where the farm harvest price index is compared with the composite price index of items of household expenditure purchased from the non-farm sector (Table II). The picture that emerges on this account may be summarised as follows:

(a) The terms of trade of all crops, with reference to household purchases, moved up significantly for most crops till about 1968-69. But thereafter the index for most cereal crops declined in the beginning of the seventies (1970-72), almost to the level of the base period in the beginning of the sixties. Subsequently, till 1974-75 there was a fresh upward spurt. But after that for many cereals, and after 1977-78 for all cereals in all States, the index declined sharply to the level of the beginning of the sixties, or even lower than that.

(b) In regard to pulses and most of the traditional cash crops like oilseeds and sugarcane, the terms of trade " have remained consistently higher than in the beginning of the sixties, despite considerable fluctuations from year to year.

(c) The index for cotton shows sharp fluctuations over the two decades, and cannot be said to have remained consistently higher than in 1961-62, though it does not show any persistent unfavourable trend either. Jute, on the other hand, not only showed great fluctuations, but also unfavourable trend in more recent years.

We may now make an attempt to read the two indices together, in order to judge what might have happened to the farmers

growing different crops in the different States during the last two and half decades.

Compared to the beginning of the sixties, the commodity or barter terms of trade of farmers increased very significantly upto 1968-69. After that there was a decline. This decline was more in relation to the index involving household expenses than that involving farm inputs, and more for cereals than for other crops. Therefore, one may infer that farmers growing cereals using little inputs purchased from the non-farm sector saw their terms of trade decline to near the position of the early sixties. Farmers growing other cereals with significant purchased inputs, as well as those growing pulses and cash crops had still favourable terms of trade.

Both the terms of trade of all farmers again improved upto 1974-75. But after that, and particularly after 1978-79, the terms of trade of all cereals declined to the level of the early sixties or even lower. The favourable terms of trade of pulses and most cash crops like oilseeds, sugarcane, however, continued with fluctuations and at a some what lower level than in the later parts of the sixties.

This overall picture shows that during the period 1961-62 to 1982-83, the barter terms of trade of farmers did not show

either a continuous rise or a continuous decline. There was a steady all-round rise till about 1968-69, then a decline, in case of certain crops almost to the 1961-62 level in 1970-72, then again a sharp rise till 1974-75, and after that a general decline, often to the 1961-62 level, or even lower, particularly in the case of cereals.

It is well understood that the barter terms of trade are not a safe guide to the changing real income position of the farmers, because it does not encompass the technological changes in agriculture affecting per acre yields, the changing crop mix in farms and the changing size of holdings. The income terms of trade can be expected to catch the first two of these three factors. Absence of relevant data prevents us from trying to build up such a time-series for various crops or regions. However, it is possible to make a few qualitative statements on the matter.

The high barter terms of trade during the middle of the sixties for all crops coincided with the steep fall in farm production and widespread famine conditions during 1965-67. Therefore, one can say that the high barter terms of trade during this period cannot be interpreted to mean improved real income position of the farmers in most regions. The high terms of trade during the subsequent two

or three years, however, indicated distinctly improved income position. This was much more so for those farmers- who switched over to the new high-yielding variety (HYV) of wheat and rice.

The decline in the index in 1970-72 was more noticed in the case of cereals, but this was more on account of the greater rise in the price of non-farm consumables purchased by the rural households. Therefore, farmers who produced cereals with very little non-farm inputs (like fertilizer, water, etc.) may be said to have suffered a decline in their real income position, back to the level of the early sixties. The producers of millets, ragi as well as rice in major rice growing regions, like eastern India, as well as wheat producers outside the northern belt, may be said to fall in this category.

The subsequent all-round rise in the farmers' terms of trade till 1974-75 was more due to the inflationary conditions prevailing in the country, than the drought conditions in some parts. This upsurge also saw both a spurt and consolidation of the new HYV technique in regard to cereals. Surely, farmers of most crops in most parts of the country, except

those subjected to drought, may be presumed to have benefited in their real income position.

The situation changed after 1974-75, essentially because of the sharp rise in the prices of farm inputs, and the anti-inflationary measures adopted soon after this year. There was a general decline in the index of terms of trade for all crops; but it was most noticeable for all cereals including wheat and rice. The situation persisted till 1983, the last year for which data are available to us. This decline, however, does not represent a worsening of the real income position of all cereal farmers in all States. Thanks to the new seed technology, the farmers producing these crops found that compared to the pre-HYV period they needed a smaller portion of their output to buy the new inputs than before, thus indicating a growingly favourable real income situation. This was the position till 1974.<sup>5</sup> After 1974, available cost and return data for crops like wheat and rice suggest that in the HYV regions, despite increased proportions of the produce being used to buy the inputs, the farmers, thanks to higher per acre yields, were left with either the same output, as in the case of wheat, or with larger output, as in the case

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5. A. Mukhopadhyaya: *Inter-Regional Variation in cost and Production and Relative Profitability of Some Major Crops in India*, Ph.D. Thesis, University of Poona, Pune, 1980-81.

of rice, than before 1974. This suggests that despite unfavourable barter terms of trade during the last some years, the wheat and rice farmers in these HYV regions were not only in a better income position compared to the early sixties, but were certainly not in an inferior position compared to the pre-1974 position. This is broadly the situation in regard to the Punjab, Haryana, Uttar Pradesh, and rice areas of Andhra Pradesh and Tamil Nadu.

The same, however, cannot be said about the rice growing eastern India (i.e., Bihar, Assam, West Bengal, and presumably Orissa, as well as the rice region of Madhya Pradesh) which has recorded a declining barter terms of trade for rice, its most important crop (except West Bengal), but no significant upward trend in per hectare yield of rice. It is well-known that the new variety of paddy seeds has still to make any impact on the main winter paddy in these States; the real change is noticed only in summer paddy in these regions, which, unfortunately, is very limited in area due to limited irrigation facility. It means, therefore, that the declining barter terms of trade for rice farmers in this region in the late seventies and early eighties also indicate a declining real income position or at best a stagnant one compared to the early sixties.

The same appears to be the situation with regard to the jowar, bajra and *ragi* farmers who account for the bulk of the unirrigated farms in the dry agricultural region of peninsular India. Their barter terms of trade have deteriorated in the late seventies and early eighties, and their per hectare yields have not registered any significant increase during the period, suggesting thereby an adverse income terms of trade compared to the early sixties. This is more likely to be the case with regard to *rabi* jowar than *kharif* jowar and bajra which have recorded some increase in yield rates due to adoption of hybrid seeds.

The producers of pulses and oilseeds have obviously not suffered any loss in real income position but rather gain in it, though fluctuating, almost entirely due to favourable barter terms of trade, since these crops have not registered any noticeable rise in yield rates. The position of sugarcane growers is similar in that while the barter terms of trade have remained favourable, the yield rates have either increased or remained unchanged, implying an improvement in their real income position.

It is difficult to say anything even in such general terms about cotton, since the trend in prices as well as yield rates of

distinctly different varieties have surely not been the same, but time-series data for these are not readily available.

Jute is a particularly unfortunate crop since its barter and income terms of trade appear to have declined during the last decade or so. If the farmers have continued to produce this, it is apparently because there is no alternative to the use of most of this land, on which transplanted paddy follows jute most of the time.

This rather long review of the changing terms of trade in relation to different crops in various States and their impact on the farmers' real income situation appears to us instructive. The two opposing perceptions of a steadily favourable terms of trade for farmers on the one side, and of worsening terms of trade all-round, on the other, appear untenable. The picture is a mixed one, type-of-farmingwise and regionwise. The northern irrigated regions as well as the coastal deltas have seen distinct improvement in the farmers' real income position not only compared to the early sixties but also compared to the early seventies, though in the later period it has seen a smaller improvement compared to the earlier period. As against this, the unirrigated agricultural regions of peninsular India and the entire eastern Indian region have seen stagnation and some

marginal deterioration in the late seventies and early eighties, preceded by some favourable trends till the early seventies.

The reasons for this may not be far to seek. Regions which have seen rapid growth of perennial irrigation facilities and successful adoption of new high-yielding seeds have been able to improve their position even in the face of declining terms of trade in recent years. The other regions have stagnated or suffered due to the absence of these basic conditions.

Can price policy change this situation? The evidence suggests that price policy can play only a very limited role in this context. That merely favourable or rising barter terms of trade cannot deliver the goods is indicated by the fact that while the barter terms of trade of pulses and oilseeds have been continuously favourable over the last two decades, often rising quite high, it has resulted in no significant increase in production of these crops. If anything, wherever it was possible to switch over such lands to the new HYV crops, it has been done. The major source of change has to be in the provision of irrigation and biotechnological improvement.

The dry agricultural farmers of peninsular India, growing unirrigated jowar, bajra, *ragi*, groundnut and cotton, have yet to be favoured with irrigation water



which can change their income and lives. These potentially water-short regions are today characterized by uneconomic use of water which at the same time limits the area of land and the number of farmers benefited. A change in the use of such water can not only help produce more per unit of water than at present, but also enable the use of more productive seeds and crops than at present. Irrigation can greatly increase productivity of millets as well as pulses, oilseeds and cotton. Indeed, extension of irrigation may lead, usefully, to a decline in the area under millets, since with increased production of rice and wheat the relative price of millets will continue to be under pressure. Today these farmers have no choice; if denied irrigation for long their real income position will deteriorate simply because of the better performance of wheat and rice in the green revolution belt.

The eastern Indian rice regions hold great potentialities provided perennial irrigation facility and suitable high-yielding paddy varieties and other crops can be developed for the winter paddy lands. The matter is complex, and mere favourable terms of trade cannot do the trick.

But this does not mean that the terms of trade have no relevance in this context. While very favourable terms of trade by themselves cannot provide great incentives to greater production,<sup>6</sup> unfavourable or declining terms of trade cannot create the necessary conditions for adoption of better techniques and higher production. One may recollect that, thanks to the liberal supply of wheat under P. L. 480 and its distribution at fixed unchanging price all over the country, the price of wheat relative to the general price level was declining during the early sixties. This situation, however, sharply changed in 1965-66 due to the severe shortfall in agricultural production and the simultaneous closure of the P. L. 480 tap. Relative price of wheat improved, and this coincided with the introduction of the HYV wheat seed. It is a matter for speculation if the new seed technology would have been adopted as fast and as widely if the price had not improved and been supported by the Agricultural Prices Commission that came into existence at the time. It is not proper to believe that eastern India will adopt any new techniques rapidly in the face of deteriorating terms of trade of most crops grown there. Policy, therefore, should ensure that the terms of trade

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6. Raj Krishna : *Agricultural Growth, Price Policy and Equity*, The World Bank, Washington, D. C., January, 1982, quoted in Kahlon and George, *op. cit.*, p. 199. Raj Krishna reports a positive but small response of aggregate farm output to terms of trade of farmers, and concludes that "a favourable price environment is essential for agricultural growth."

are not allowed to deteriorate when one is planning and executing new techniques and crops for the region.

This implies that one can think in terms of a somewhat differential price policy for certain crops, like rice in eastern zone, millets in peninsular India, than in more developed region. The present price situation in the developed agricultural regions does not appear to have led to deteriorating income terms of trade of farmers not only with reference to the pre-HYV period of the early sixties, but also compared to the much better income position of the early seventies. The only caution one may advocate here is to ensure that the emerging price situation there does not lead to deterioration in the income terms of trade. In the other regions, however, where declining barter terms of trade indicate also declining income terms of trade, in the prevailing price situation, it appears necessary and advisable to prevent this from happening in the interest of greater acceptance of newer techniques. If this implies marginally higher procurement/support price (and now the two are the same) of paddy

or rice or millets in the more agriculturally undeveloped regions, this may be considered both necessary and desirable.<sup>7</sup>

The fixation of support price appears to have neglected these considerations. In the first place, the effort is to fix a single price for a crop for the whole country. Our examination of the data would suggest that this is not equally fair for every region. A regionally differential support price, so fixed that the price difference between any two regions does not exceed the transport costs, would be useful. Secondly, examination of the procurement prices over the years show that the increase in procurement prices kept pace with the rise in price of farm inputs, but not necessarily with the rise in the price index of household commodities purchased by the farm sector. Since many of the commodities in the relatively under-developed regions involved little inputs from the non-farm sector, the relevant prices to compare with, in their case, would be the prices of consumables purchased by the farm households. It would be necessary to keep this in view in fixing support prices for such crops. Today the object of agricultural price policy is to provide a support price to farm

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7. The problem of jute requires special attention. Till 1977-78 the farm harvest price of raw jute appears to have generally kept pace with the wholesale price of jute manufactures. Therefore, the rather depressed terms of trade may be a reflection of the conditions of demand affecting jute manufactures. However, after 1977-78 the farm harvest price of jute appears to be steadily lagging behind the wholesale price of jute manufactures. Whatever the reason, it raises a question about the appropriate support price for jute.

products against sharp fluctuations in the - market, and not compulsorily buy a part of the produce for sale at subsidised prices. Support in this context must take changing prospects of both demand and supply into account. While doing so, it has to take the changing income terms of trade into consideration so that farmers do not suffer a loss in real income.

It may not be out of place to mention here that in these under-developed agricultural regions one sometimes finds farmers selling their produce at prices lower than the announced support price, simply because there is no official agency to buy at the stated price. If failure to take such elementary precaution persists, all other advocacy on price policy shall be no better than paper exercises.

In the absence of technological improvement, mere favourable barter terms of trade will amount to only increasing the rental component in farm income. This surely cannot be the solution to the problem of stagnant income of the agricultural sector in India, though the advocacy of state-run agricultural cartels will amount to that. A fair deal to the farm sector will have to start with a fair deal to the farm labourers, and small and marginal farmers who are also mainly wage workers. This can be done not only by ensuring at least a subsistence minimum wage in agricultural operation, but also

by providing such workers with wage work at this wage rate for the remaining days of the year. This can be effectively achieved, like in the case of enforcement of support price for farm products, by the state guaranteeing employment at the minimum wage rate to whosoever wants it in the countryside. An effective minimum wage rate, enforced in this manner, should be able to ensure a better income for farm labourers. It will influence farm product prices in two ways: In the first place, higher wage rates for wage labour, and consequently, a higher opportunity cost for family labour, would get reflected in the cost of production of farm products, and therefore in their support as well as market prices. Secondly, higher income of agricultural labourers will create greater demand for farm products, particularly cereals, thereby helping to keep up prices. Today one sees the extraordinary spectacle of the state carrying a buffer stock of 29 million tonnes of foodgrains while half the rural households is found to be too poor to afford even enough food every day of the year. Improved real income for such people therefore shall be twice blessed.

Of course, a somewhat higher farm product price can be offset by a corresponding rise in non-farm prices, through not only a rise in the cost of inputs from the farm sector but also a rise in the non-farm salaries and wages. Persistent

price adjustments in this manner can only set inflationary spiral in motion, and prove self-defeating. Therefore, it is necessary to acknowledge that the question involved is one of fair distribution of income in the society between the farm and non-farm sector. A proper wages and incomes policy for our society, so often advocated, must have this as one of its important goals. In our anxiety to please everyone, we must not forget that, in the context of a dynamic economy, giving a somewhat higher portion of the incremental income to the under-privileged must mean a much smaller share of the incremental to the others. It is useful to remind ourselves that the country has adopted a policy, however unevenly and haltingly implemented, of putting a ceiling on land holdings. Given the present available technology, a dry farmer in Maharashtra, for example, with a ceiling on land holding of 54 acres for his family, cannot get more than Rs. 20,000 a year as net income from his farm (net of out of pocket expenses), in a normal year. And that is the exemption limit for non-farm income for income-tax purposes. Irrigation surely opens up greater opportunities. But the fact of the

matter is, there is a policy for the farm sector. This needs to be strengthened with a policy relating to the wage labourers in that sector. But there is no policy today relating to the non-farm sector *vis-à-vis* the farm sector. Surely, one cannot pretend that this is not relevant.

The debate on farm price policy in India has suffered from rather extreme and therefore rather simplistic stands. The problems are more complex, both in the regional and temporal sense. The major thrust has to be in the direction of creation of new resources and techniques and appropriate policy frame for their economic utilization. Price policy can play a positive but limited role in this context. A regional and cropwise differential support price policy would appear to be necessary and useful, if judiciously formulated. The wider question of a fairer distribution of income requires a more comprehensive incomes policy than mere higher prices for farm products. A careful understanding of these problems and implications should be a first necessary step in the formulation of appropriate policies.

**Table 1. Index of the Ratio of the Index of Farm Harvest Prices of Individual Crops to the Composite Index of the Prices of Inputs Purchased by the Farmers from the Non-Farm Sector for each Crop in Different States**

(1961-62=-100)

Year	(a) Bihar						(b) Uttar Pradesh		
	Autumn paddy	Winter paddy	Wheat	Maize	Jute	Sugarcane	Barley	Wheat	Paddy
1961-62	100	100	100	100	100	100	100	100	100
1962-63	103	108	82	93	65	112	91	99	103
1963-64	105	113	107	95	72	158	132	129	97
1964-65	138	125	154	165	104	160	158	167	140
1965-66	208	175	166	191	116	140	172	164	182
1966-67	145	254	211	214	122	185	252	253	224
1967-68	254	222	134	238	84	319	159	157	208
1968-69	150	147	133	148	144	197	143	155	150
1969-70	140	151	136	148	95	142	154	168	147
1970-71	143	147	117	133	120	134	123	137	138
1971-72	132	135	112	163	88	204	137	134	134
1972-73	144	153	138	161	96	234	175	135	154
1973-74	182	224	186	205	72	229	212	195	162
1974-75	183	148	111	189	78	158	164	146	152
1975-76	106	97	78	115	51	132	77	92	95
1976-77	116	119	91	110	64	140	103	108	97
1977-78	135	116	89	140	74	138	415	113	118
1978-79	115	168	89	126	81	129	102	106	116
1979-80	111	140	96	137	73	238	118	107	141
1980-81	96	102	86	112	50	148	103	92	107
1981-82	84	110	85	111	42	149	88	92	100
1982-83	120	131	103	125	62	125	103	99	110

(Contd.)

TABLE I (Contd.)

Year	(c) West Bengal			(d) Andhra Pradesh					
	Autumn paddy	Winter paddy	Wheat	Paddy	Jowar	Groundnut	Cotton	Sugarcane	Tobacco
1962-63	104	124	107	95	92	94	125	132	101
1963-64	114	132	125	100	101	98	116	180	100
1964-65	120	138	132	115	136	138	119	202	120
1965-66	143	164	167	119	136	192	141	200	113
1966-67	170	199	175	118	135	206	149	295	114
1967-68	193	216	192	127	130	134	141	529	131
1968-69	165	184	143	147	131	150	132	262	167
1969-70	159	173	139	121	151	169	162	174	159
1970-71	164	176	160	117	151	163	192	244	154
1971-72	163	189	235	135	136	146	173	267	143
1972-73	164	182	246	156	146	207	175	325	136
1973-74	233	217	219	146	136	222	275	261	136
1974-75	168	141	140	120	160	181	130	299	101
1975-76	127	184	126	89	99	93	106	192	97
1976-77	129	140	153	103	110	157	181	206	164
1977-78	124	123	140	102	102	142	145	145	98
1978-79	124	136	132	95	85	132	162	154	149
1979-80	132	156	115	103	82	154	153	302	153
1980-81	110	110	98	92	88	164	146	287	139
1981-82	104	121	109	91	91	149	130	183	135
1982-83	-	141	120	95	82	154	114	158	123

(Contd.)

TABLE I (Contd.)

Year	(e) Assam		(j) Kerala	(g) Tamil Nadu				
	paddy	Rapeseed and mustard	Paddy	Rice	Jowar	Groundnut	Cotton	Sugarcane
1962-63	104	99	93	90	92	92	114	187
1963-64	105	90	101	108	100	98	114	175
1964-65	113	97	151	112	120	123	120	161
1965-66	128	102	191	120	114	164	120	156
1966-67	158	114	210	108	110	160	144	220
1967-68	169	141	246	104	107	143	124	179
1968-69	181	135	194	102	148	140	139	176
1969-70	148	130	189	127	143	184	142	149
1970-71	118	145	148	120	129	160	165	199
1971-72	135	117	160	122	129	153	149	219
1972-73	109	128	181	116	128	158	142	237
1973-74	168	152	258	141	155	216	147	201
1974-75	156	110	213	-	191	247	87	130
1975-76	95	77	147	-	102	171	97	139
1976-77	99	125	125	-	114	204	142	164
1977-78	107	132	118	99	103	207	145	121
1978-79	101	137	112	104	80	86	138	132
1979-80	107	124	115	117	78	158	105	-
1980-81	103	138	99	100	78	136	96	212
1981-82	93	111	104	101	85	139	100	100
1982-83	101	105	118	99	74	158	89	97

(Contd.)

TABLE I (Contd.)

Year	(h) Karnataka				(i) Maharashtra			
	Jowar	Ragi	Groundnut	Cotton	Jowar	Bajra	Cotton	Sugarcane
1962-63	92	82	92	102	104	99	121	141
1963-64	101	92	106	109	115	103	132	204
1964-65	142	173	136	117	121	154	142	200
1965-66	167	235	181	108	143	205	118	163
1966-67	136	181	208	164	136	155	139	298
1967-68	139	173	140	120	126	161	69	417
1968-69	-	154	142	130	130	143	110	259
1969-70	109	133	160	144	126	138	108	158
1970-71	-	120	157	169	144	120	128	189
1971-72	117	117	128	132	150	128	127	258
1972-73	159	150	189	144	177	189	138	331
1973-74	143	179	227	193	229	133	226	253
1974-75	137	154	124	94	182	134	114	201
1975-76	93	75	82	88	136	105	89	164
1976-77	105	123	143	139	120	97	86	172
1977-78	85	95	145	116	110	104	174	148
1978-79	77	81	122	107	108	90	144	129
1979-80	77	83	152	106	104	85	142	-
1980-81	85	102	147	104	110	87	146	256
1981-82	78	93	142	88	96	76	132	138
1982-83	67	90	144	88	96	76	126	132

(Contd.)



TABLE I (Contd.)

Year	(j) Gujarat				(k) Madhya Pradesh				
	Bajra	Jowar		Groundnut	Rice	Jowar	Wheat	Gram	Cotton
		Kharif	Rabi						
1962-63	99	93	-	91	78	97	89	87	101
1963-64	116	102	-	100	91	119	110	127	105
1964-65	150	131	-	111	110	131	129	117	117
1965-66	164	146	-	152	117	126	123	124	115
1966-67	171	148	-	174	131	128	141	123	130
1967-68	147	148	132	119	152	138	160	153	117
1968-69	149	149	144	132	149	138	151	153	113
1969-70	141	152	163	163	138	170	159	176	135
1970-71	97	132	116	158	125	150	131	130	191
1971-72	108	119	140	144	125	154	132	143	137
1972-73	160	172	185	170	140	148	139	199	135
1973-74	148	195	190	211	160	228	196	265	163
1974-75	168	188	-	146	154	186	146	184	115
1975-76	96	97	-	93	118	107	91	110	93
1976-77	99	102	-	109	118	115	116	122	169
1977-78	109	107	-	135	124	122	122	175	144
1978-79	107	100	-	145	114	111	110	163	124
1979-80	97	99	-	158	150	111	125	169	116
1980-81	99	100	-	158	108	111	114	222	127
1981-82	88	86	-	121	104	100	99	146	126
1982-83	89	96	-	162	122	102	115	132	97

(Contd.)

TABLE I (Contd.)

Year	(l) Punjab					(m) Haryana				
	Paddy	Wheat	Maize	Cotton (American)	Sugarcane	Paddy	Wheat	Gram	Bajra	Cotton (American)
1962-63	88	101	91	81	116					
1963-64	76	115	104	86	197					
1964-65	133	131	141	106	178					
1965-66	106	150	151	120	112					
1966-67	116	170	199	155	195	124	205	203	166	125
1967-68	106	150	150	133	400	127	139	173	155	117
1968-69	109	129	133	112	223	119	157	193	147	132
1969-70	109	138	121	123	151	112	158	182	137	143
1970-71	105	131	117	196	143	112	138	151	89	172
1971-72	103	126	118	184	205	112	141	166	108	183
1972-73	95	120	114	183	247	153	135	236	187	188
1973-74	104	154	117	177	192	116	155	275	156	183
1974-75	130	104	156	135	143	85	112	225	131	134
1975-76	73	91	83	87	126	81	96	103	81	90
1976-77	96	104	101	147	143	81	103	130	82	147
1977-78	99	106	128	164	134	87	106	154	91	156
1978-79	86	106	120	96	73	86	107	171	81	137
1979-80	86	102	116	111	174	82	102	212	102	122
1980-81	75	90	106	112	180	79	91	237	94	113
1981-82	64	85	99	126	141	68	92	181	83	110
1982-83	74	87	113	108	140	76	92	163	81	108

(Contd.)

TABLE I (Concl'd.)

Year	(n) Rajasthan					Rapeseed and mustard
	Jowar	Bajra	Wheat	Maize	Gram	
1962-63	88	93	95	97	118	101
1963-64	106	113	114	112	154	118
1964-65	126	128	128	140	179	148
1965-66	130	146	159	168	174	166
1966-67	158	154	207	196	216	179
1967-68	129	135	151	145	184	139
1968-69	139	144	162	174	207	133
1969-70	148	144	163	155	210	147
1970-71	118	95	129	126	167	145
1971-72	132	95	137	129	185	146
1972-73	144	136	156	159	217	165
1973-74	183	139	181	234	330	166
1974-75	195	197	151	226	247	129
1975-76	117	99	91	102	129	80
1976-77	110	92	106	105	163	151
1977-78	119	118	109	138	200	141
1978-79	112	104	107	125	197	140
1979-80	106	100	105	127	219	122
1980-81	94	91	94	118	266	130
1981-82	88	98	97	119	209	115
1982-83	90	89	90	108	185	90

**Table II. Index of the Ratio of the Index of Farm Harvest Price of Produce Received by Farmers to the Index of Prices Paid by Rural Households for Goods of Household Consumption Purchased from the Non-Farm Sector in Different States**

(1961-62=100)

Year	(a) Andhra Pradesh						
	Paddy	Jowar	Ragi	Tobacco	Groundnut	Cotton	Sugarcane
1961-62	100	100	100	100	100	100	100
1962-63	89	90	100	95	92	117	131
1963-64	91	95	86	108	92	102	176
1964-65	99	123	122	100	126	99	187
1965-66	94	115	127	120	158	109	164
1966-67	90	110	128	113	167	112	238
1967-68	102	107	126	145	116	113	469
1968-69	119	109	111	136	126	101	223
1969-70	96	93	97	130	138	119	144
1970-71	91	95	92	117	133	142	195
1971-72	102	116	105	113	177	122	207
1972-73	104	112	107	108	154	116	232
1973-74	96	98	108	101	156	177	182
1974-75	115	149	140	81	172	123	198
1975-76	93	103	91	150	99	110	206
1976-77	89	99	95	143	142	168	184
1977-78	90	92	88	86	129	136	131
1978-79	76	73	72	120	112	150	127
1979-80	78	71	73	117	129	130	227
1980-81	84	85	83	126	153	146	264
1981-82	92	95	90	144	155	141	188
1982-83	91	82	85	117	153	122	155

(Contd.)

TABLE II (Contd.)

Year	(b) Bihar								
	Rice	Maize	Ragi	Wheat	Gram	Sugarcane	Tobacco	Rape-seed and mustard	Jute
1961-62	100	100	100	100	100	100	100	100	100
1962-63	98	87	89	78	97	73	103	103	69
1963-64	93	84	86	96	122	14	175	106	64
1964-65	117	140	143	132	167	138	122	142	89
1965-66	167	153	136	136	156	112	116	154	95
1966-67	173	160	146	159	201	138	89	131	93
1967-68	215	200	194	113	177	267	98	118	71
1968-69	133	126	117	114	146	168	83	124	122
1969-70	117	122	112	113	161	117	119	135	78
1970-71	115	105	107	93	125	105	59	137	97
1971-72	105	124	115	85	129	154	112	139	69
1972-73	107	118	106	101	157	168	85	124	73
1973-74	119	134	106	123	205	149	92	217	48
1974-75	192	196	178	114	184	162	104	145	78
1975-76	117	124	132	84	140	142	126	104	55
1976-77	99	93	93	77	127	117	103	154	55
1977-78	115	118	103	75	174	116	94	161	63
1978-79	93	100	86	72	177	102	101	148	67
1979-80	82	101	83	73	169	176	98	158	58
1980-81	86	102	87	79	215	136	93	166	46
1981-82	86	114	125	88	209	155	94	167	43
1982-83	117	123	114	102	181	123	85	154	62

(Contd.)

TABLE II (Contd.)

Year	(c) Gujarat							
	Rice	Maize	Ragi	Wheat	Gram	Sugarcane	Tobacco	Rape-seed and mustard
1961-62	100	100	100	100	100	100	100	100
1962-63	80	91	90	89	83	83	86	92
1963-64	-	97	105	104	92	93	92	93
1964-65	-	126	134	122	164	109	100	83
1965-66	-	129	130	105	276	113	126	101
1966-67	-	116	122	120	193	111	126	81
1967-68	140	116	108	102	123	111	93	81
1968-69	157	128	121	114	127	94	113	108
1969-70	140	129	114	99	147	134	139	113
1970-71	102	114	75	86	117	171	130	142
1971-72	99	92	77	86	101	129	110	103
1972-73	128	134	106	101	119	99	121	110
1973-74	151	139	99	110	163	99	144	118
1974-75	183	161	144	113	155	134	139	100
1975-76	97	97	81	98	107	132	96	97
1976-77	82	92	82	77	97	64	97	125
1977-78	90	105	98	92	147	70	129	111
1978-79	90	93	86	82	149	75	125	96
1979-80	86	87	75	73	131	57	117	83
1980-81	96	91	88	77	188	76	136	-
1981-82	100	91	90	85	160	104	121	-
1982-83	109	97	86	88	132	91	152	-

(Contd.)

TABLE II (Contd.)

Year	(d) Karnataka						
	Jowar	Ragi	Wheat	Gram	Tobacco	Groundnut	Cotton
1961-62	100	100	100	100	100	100	100
1962-63	84	81	89	-	99	91	100
1963-64	94	83	84	115	64	95	96
1964-65	127	150	84	187	66	118	98
1965-66	140	192	157	189	42	147	86
1966-67	105	136	141	136	42	156	118
1967-68	115	141	130	-	55	115	98
1968-69	111	131	125	135	36	122	171
1969-70	92	111	97	150	77	134	116
1970-71	99	99	96	116	82	130	132
1971-72	95	93	87	119	77	102	98
1972-73	114	112	104	176	71	142	101
1973-74	108	123	135	204	34	155	127
1974-75	131	151	108	165	58	122	94
1975-76	97	79	77	115	74	87	94
1976-77	95	111	94	104	82	128	130
1977-78	78	87	91	165	43	130	110
1978-79	66	70	82	141	45	102	94
1979-80	62	67	77	145	57	119	87
1980-81	80	97	106	207	35	135	102
1981-82	83	100	93	166	68	150	97
1982-83	69	92	97	139	56	145	94

(Contd.)

TABLE II (Contd.)

Year	(e) Madhya Pradesh							
	Rice	Jowar	Bajra	Wheat	Gram	Tobacco	Groundnut	Cotton
1961-62	100	100	100	100	100	100	100	100
1962-63	75	94	84	84	83	117	98	91
1963-64	81	101	85	100	120	142	89	91
1964-65	96	119	109	115	108	162	122	98
1965-66	94	107	110	101	106	166	157	90
1966-67	98	101	121	106	98	157	171	94
1967-68	125	113	124	130	125	140	129	90
1968-69	128	118	114	129	131	118	134	91
1969-70	119	114	118	134	149	121	151	107
1970-71	103	126	95	108	110	132	160	148
1971-72	97	127	92	104	118	115	130	102
1972-73	102	117	110	103	156	116	156	95
1973-74	107	167	114	136	196	100	167	108
1974-75	158	174	172	142	171	108	174	105
1975-76	129	110	90	96	94	125	114	93
1976-77	105	105	85	103	110	111	139	145
1977-78	112	116	114	111	166	111	161	127
1978-79	95	100	78	94	147	84	141	103
1979-80	107	94	94	96	144	70	146	86
1980-81	98	106	92	106	215	-	167	120
1981-82	108	108	107	103	159	-	186	134
1982-83	121	109	104	118	141	-	178	101

(Contd.)



TABLE II (Contd.)

Year	(f) Maharashtra						
	Paddy	Jowar	Bajra	Wheat	Sugarcane	Groundnut	Cotton
1961-62	100	100	100	100	100	100	100
1962-63	94	98	94	89	131	92	110
1963-64	124	105	95	116	196	94	113
1964-65	153	110	141	157	187	121	119
1965-66	169	120	173	112	135	151	93
1966-67	135	105	122	84	231	141	100
1967-68	140	102	131	94	338	124	55
1968-69	138	111	124	87	225	141	92
1969-70	127	107	119	80	148	162	91
1970-71	123	121	101	110	151	149	103
1971-72	119	122	103	103	193	126	95
1972-73	-	135	144	123	233	168	97
1973-74	-	165	121	154	220	176	147
1974-75	-	164	123	142	185	154	111
1975-76	-	141	109	112	168	123	81
1976-77	109	107	101	94	149	147	76
1977-78	108	103	99	100	135	147	159
1978-79	90	94	78	87	106	125	119
1979-80	85	85	68	81	-	133	107
1980-81	94	105	84	99	247	163	134
1981-82	103	104	82	102	149	166	136
1982-83	107	100	79	105	138	164	125

(Contd.)

TABLE II (Contd.)

Year	(g) Punjab								
	Rice	Bajra	Maize	Wheat	Barley	Gram	Sugarcane	Groundnut	Cotton
1961-62	100	100	100	100	100	100	100	100	100
1962-63	82	86	85	95	90	94	109	106	77
1963-64	72	93	96	106	111	117	187	103	80
1964-65	126	126	129	119	145	127	168	132	99
1965-66	91	112	129	128	160	149	97	190	104
1966-67	86	126	149	128	188	170	149	183	118
1967-68	83	109	117	117	116	140	312	114	103
1968-69	98	112	119	116	138	181	200	139	99
1969-70	99	119	110	124	128	169	136	154	122
1970-71	88	88	100	112	109	130	119	165	166
1971-72	80	83	94	99	99	153	157	127	145
1972-73	73	185	88	94	167	182	186	144	143
1973-74	79	119	86	114	157	230	145	168	134
1974-75	129	174	159	105	133	214	143	179	134
1975-76	78	91	91	99	77	112	131	122	94
1976-77	91	79	96	98	99	129	135	148	143
1977-78	99	91	126	103	79	162	133	199	167
1978-79	77	80	106	95	93	157	64	138	88
1979-80	70	72	91	80	95	182	140	136	94
1980-81	72	87	100	85	86	260	176	102	111
1981-82	72	104	110	94	93	226	159	228	144
1982-83	83	113	121	93	100	226	155	198	121

(Contd.)

TABLE II (Contd.)

Year	(h) Rajasthan					
	Rice	Bajra	Wheat	Gram	Sugarcane	Rapseed and mustard
1961-62	100	100	100	100	100	100
1962-63	105	90	91	115	145	97
1963-64	95	108	111	145	190	117
1964-65	122	122	123	169	149	146
1965-66	222	130	137	153	116	148
1966-67	218	125	166	175	208	147
1967-68	165	110	124	151	293	114
1968-69	156	125	141	181	191	116
1969-70	139	124	140	179	114	125
1970-71	130	81	104	142	106	119
1971-72	108	79	105	153	157	116
1972-73	116	108	114	172	151	125
1973-74	101	106	133	249	128	128
1974-75	185	181	142	229	133	118
1975-76	134	101	93	133	132	80
1976-77	117	85	97	153	129	140
1977-78	116	114	102	192	94	135
1978-79	110	96	92	182	84	126
1979-80	114	91	91	202	153	115
1980-81	121	91	94	266	166	134
1981-82	120	108	109	237	193	133
1982-83	119	106	108	223	203	112

(Contd.)

TABLE II (Contd.)

Year	(i) Tamil Nadu								
	Rice	Jowar	Ragi	Bajra	Sugarcane	Groundnut	Sesamum	Cotton	Tobacco
1961-62	100	100	100	100	100	100	100	100	100
1962-63	86	91	89	91	179	90	88	109	96
1963-64	100	102	87	95	166	98	96	110	145
1964-65	96	116	112	111	145	117	99	105	112
1965-66	91	113	120	107	121	136	120	94	117
1966-67	82	92	95	95	171	132	133	111	108
1967-68	89	93	96	96	238	123	118	102	88
1968-69	83	124	120	121	145	117	115	110	104
1969-70	101	113	105	109	117	259	126	108	90
1970-71	95	103	97	98	155	128	121	126	128
1971-72	93	103	98	92	165	121	120	110	145
1972-73	79	93	88	88	161	115	131	95	131
1973-74	95	119	116	106	141	163	140	101	116
1974-75	-	171	168	160	127	228	143	85	113
1975-76	-	97	82	99	140	166	111	98	171
1976-77	-	99	90	89	141	176	115	128	114
1977-78	87	93	84	93	106	186	116	134	93
1978-79	85	68	71	65	106	72	97	117	63
1979-80	88	68	74	64	-	141	109	87	74
1980-81	91	78	90	78	200	134	127	95	71
1981-82	102	94	96	88	104	151	143	108	64
1982-83	95	80	91	78	97	166	133	94	56

(Contd.)

TABLE II (Contd.)

Year	(j) Uttar Pradesh							
	Paddy	Wheat	Barley	Gram	Sugarcane	Groundnut	Rapeseed and mustard	Cotton
1961-62	100	100	100	100	100	100	100	100
1962-63	99	95	80	99	96	83	96	102
1963-64	91	122	117	131	118	100	110	89
1964-65	129	155	139	146	-	123	119	111
1965-66	156	141	137	147	-	138	131	115
1966-67	174	198	185	218	-	169	154	111
1967-68	170	129	119	150	-	130	111	110
1968-69	127	131	111	143	-	119	121	106
1969-70	129	147	122	167	117	145	132	109
1970-71	118	113	93	119	107	155	130	116
1971-72	105	105	98	136	119	110	127	118
1972-73	117	104	123	171	153	141	127	104
1973-74	117	148	152	238	133	181	182	119
1974-75	154	144	144	201	134	162	127	138
1975-76	104	100	82	-	-	-	-	-
1976-77	91	96	89	130	110	135	169	137
1977-78	112	106	113	186	104	145	165	160
1978-79	102	92	90	169	-	110	130	135
1979-80	113	87	101	173	-	143	148	96
1980-81	103	88	102	227	-	165	149	114
1981-82	112	103	101	198	-	140	131	150
1982-83	119	107	115	168	-	164	143	148

(Contd.)

TABLE II (Concl'd.)

Year	(k) Assam	(l) Kerala	(m) West Bengal			
	Rice	Rice	Autumn rice	Winter rice	Wheat	Jute
1961-62	100	100	100	100	100	100
1962-63	101	87	98	115	100	76
1963-64	94	93	99	114	109	93
1964-65	102	128	101	112	109	94
1965-66	111	157	114	126	130	97
1966-67	122	163	123	140	126	90
1967-68	134	204	157	173	157	79
1968-69	152	168	138	153	121	103
1969-70	121	158	129	140	114	99
1970-71	98	122	129	136	117	98
1971-72	111	128	122	137	105	91
1972-73	95	138	119	127	105	88
1973-74	107	178	112	133	153	70
1974-75	140	224	169	145	131	66
1975-76	95	159	135	113	94	55
1976-77	84	116	106	115	87	71
1977-78	95	105	102	101	88	71
1978-79	89	95	98	106	85	67
1979-80	90	89	92	102	77	58
1980-81	93	115	103	101	91	53
1981-82	91	113	113	129	116	58
1982-83	99	116	-	141	117	59

# ECONOMICS OF UTILISATION OF CANAL WATER IN DRY AGRICULTURAL REGIONS\*

Nilakantha Rath and A. K. Mitra†

Agricultural development in India depends heavily on the availability of irrigation. However, water for irrigation appears to be potentially in short supply in the country. In 1980-81 49.585 million hectares (ha.) of crop land, constituting only about 28 per cent of the total crop land (28.61 per cent of the gross cropped area and 27.66 per cent of the net sown area) was irrigated. The ultimate irrigation potential from all sources, surface and underground, is estimated to be 113.5 million ha. of gross irrigated area. Assuming the present intensity of irrigation, this implies that nearly 60.6 per cent of the gross cropped area, Of about 63.3 per cent of the net cropped area in the country, can ever be irrigated (refer Appendix 1).

This all-India picture also does not highlight the wide regional variation in this context. The ultimate irrigation potential in the Indo-Gangetic plains, the Brahmaputra valley, as well as in the large river delta regions in the eastern coast is very high, nearly 100 per cent. As against this, in the plateau region of India, starting with Rajasthan in the north to

Tamil Nadu in the south, the ultimate irrigation potential is severely limited. In the case of many of the States, falling mainly within the plateau region, the ultimate irrigation potential from major and medium surface irrigation projects does not appear to be more than 40 per cent; the overall would be about one-third of the total crop area.<sup>1</sup> And, unlike in the Indo-Gangetic plains, the possibilities of underground water availability is very limited and uncertain. Maharashtra's situation may be presented to illustrate the point.

## ASSESSMENT OF IRRIGATION POTENTIAL

The total irrigation potential created by June 1982 from sources of flow irrigation in Maharashtra, measured in terms of gross irrigable crop area, was 2.16 million ha., constituting about 12 per cent of the total net sown area of the State. In the ultimate analysis, another 4 million ha. are expected to be added to this, when all the flow irrigation potential is fully worked out, making this equal to 33 per cent of the present net sown area (refer Appendix 2). Within the State also there

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\* This paper is based on a study of the subject, conducted in the Gokhale Institute of Politics and Economics, Pune, awaiting publication.

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1. Compare the ultimate irrigation potential of all medium and major irrigation schemes, given in Annexure 3.2 of the Seventh Five Year Plan, 1985-90, Vol. II, Planning Commission, Government of India, New Delhi, 1985 with the latest available data on net sown/gross cropped area of the concerned States.

is great regional variation. The districts of Dhule, Nashik, Ahmednagar, Pune, Solapur, Sangli, Osmanabad, Beed, Aurangabad, Buldhana, Akola and Amravati have a lower ultimate potentiality than the State average. No firm estimates are available about the potentiality of irrigation from underground water, which, in any case, is very limited and uncertain in these districts. Therefore, the flow irrigation potentiality indicates the serious limits to the availability of water for irrigation in large parts of Maharashtra.

Indeed, the above method of estimating irrigation potentiality has a limitation that makes these figures non-comparable among districts (or States). The irrigated crop area consists of different crops, in varying proportions indifferent districts, and the future potential is estimated by assuming the present pattern of cropping under irrigation to hold for the newer irrigated areas as well. Since different crops require different quantities of water for irrigation, the total irrigated crop areas in different districts cannot give a correct indication of the difference in the quantities of water available for irrigation among the districts: In order to make these areas comparable in terms of what the Maharashtra State Irrigation Commission (1962) termed as 'standard crop area', the Fact Finding Committee on Regional Imbalance in Maharashtra, with

the help of the information provided by the State Irrigation. Department, have expressed, in their Report (April 1984), the ultimate potential (as well as the present created potential) irrigated area in terms of 'Irrigated Rabi Jowar' area equivalent. These are presented in Appendix 3. The data show that, if irrigation water were to be given for only *rabi* jowar crop, the total potentially available water from flow sources will be able to irrigate about 64 per cent of the net sown area in the State. In the 11 districts mentioned above, this percentage is lower, in some cases much lower than the State average.

These data go to demonstrate the potential scarcity of water for irrigation in large parts of the State, where rainfall is also on the low side. Indeed, it is clear that the input Which is potentially in shortest supply, relative to all other inputs for agriculture, is water for irrigation. Elementary economic logic and commonsense suggests that in such a situation the other inputs, including land, should be so used in conjunction with water that, in the ultimate analysis, the net return per unit of water (not per unit of irrigated land) shall be the maximum. Any individual farmer, faced with such a situation, would take decision along this line. When a whole region is faced with such a situation, and the State is the supplier of the scarcest factor, water, the policy of



water use and management should be so designed as to maximise the net return per unit of water. This is important, because if this care is not taken, it is conceivable that individual farmers faced with unlimited (or very large) supply of water in relation to their limited land area would try to maximise the return per unit of irrigated land, while the rationale at the social level would require, the opposite. It is, therefore, necessary to examine if, the pattern of canal water utilisation, that is, the cropping pattern under irrigation, in these water-scarce dry agricultural regions leads to the maximisation of net return per unit of water.

#### **ECONOMIC APPRAISAL OF PRESENT PATTERN OF USE OF SURFACE IRRIGATION WATER**

In Maharashtra, particularly in the dry plateau region of Western- Maharashtra, the dominant crop under canal irrigation, not in terms of area, but in terms of share of total irrigation water used, is sugarcane. In the State as a whole, sugarcane accounts for about one-ninth of the gross irrigated crop area; but it uses around 60 per cent of the total irrigation water. Take the Pravara Left Bank Canal, a 60-year

old major irrigation system, in Ahmednagar district. It has a culturable command area of 85 thousand acres; but the actual irrigated area (in 1978-79, for example) is only about 30 per cent (25,000 acres). Thus, 70 per cent of the cultivated land within the command area of the system is not able to get any canal water during the year. Nearly 20 per cent of the irrigated land is under sugarcane block, and a further 3,000 acres of sugarcane land under wells receive supplementary water from canal in summer season. Sugarcane, therefore, does not account for a very large percentage of the gross irrigated crop area. But sugarcane is a heavy water using crop. Various official estimates of irrigation water use/requirement of different crops in the region as well as some statistical exercises relating the total water supply to irrigated crop acreages, give us reasonable estimates of the actual supply of water, at the distributory head, to various crops in the region. These are presented in col. 2 of Table I. It appears that an acre of sugarcane takes at least eight times as much irrigated water as seasonal crops like jowar and bajra, and six times that of other seasonal crops. The important question to ask in this connection,

**Table I. Irrigation Water Requirement of Crops at Distributory Head- and the Net Farm Business Income Per Unit of Water Used (1978-79)**

Name of the Crop	Water requirement (acre-inch)	Area that can be irrigated per mcft. of water (acres)	Net farm business income per acre	Net farm business income per mcft. of water (Rs.)
(1)	(2)	(3)	(4)	d(5)
1. Sugarcane (Adsali, i.e., 18 months)	175	1.55	1,515	2,348
2. Sugarcane (suru; i.e., 12 months)	136	2.00	1,195	2,390
3. Bajra (HYV-kharif)	20	13.80	441	6,086
4. Bajra (local)	20	13.80	251	3,464
5. Groundnut (HYV-kharif)	24	11.50	525	6,038
6. Groundnut (local-kharif)	24	11.50	340	3,910
7. Cotton (HYV-kharif)	24	11.50	649	7,463
8. Maize (local-kharif)	20	13.80	435	6,003
9. Hybrid jowar (kharif)	15	18.40	485	8,924
10. Jowar (local -rabi)	22	12.50	317	3,962
11. Wheat (HYV)	30	9.20	492	4,526
12. Wheat (local)	30	9.20	243	2,235
13. Onion (rabi)	36	7.65	1,060	8,109
14. Gram (local)	18	15.30	290	4,437
15. Onion (hot weather)	42	6.55	1,060	6,943
16. Maize (hot weather)	36	7.65	435	3,328
17. Cotton L. S. (hot weather)	42	6.55	760	4,978
18. Groundnut (hot weather)	36	7.65	485	3,710

is whether a cropping pattern under irrigation with sugarcane having the place in it that it has today, leads to the most profitable use of irrigation water, in the sense that it maximises net return per acre-inch of irrigation water.

In order to answer this question we must first ascertain the farm business income per acre of different irrigated crops in the region (that is gross value of produce minus all out-of-pocket

expenses, which leaves the return to family labour and owned land with the cultivator). The yield rates of different crops and their by-products, the physical inputs for the various crops relate to the Pravara and Nira Left Bank Canal regions acid are based on the cost of production surveys conducted by the Government of India since 1972 as well as by the Gokhale Institute of a sample of farmers specially studied for the purpose. The yield and price data have been examined for trends

as well as changes in relative prices of both outputs and inputs. The calculations refer to the year 1978-79, but are adjusted to be consistent with trends in relative prices and yields. The net farm business incomes per acre of various irrigated crops in this region are given in Table I, col. 4.

The data show that sugarcane gave the highest farm business income per acre, much higher than all other seasonal crops. If irrigation water were plentiful compared to the land awaiting irrigation, a sugarcane-centred irrigated cropping system would appear to be the most appropriate. But it is not so. Therefore, it is useful to examine the value of the net farm business income that will be generated by using one million cubic feet (mcft.) of irrigation water in different crops. Col. 3 of Table I gives the area under different crops that can be irrigated with one mcft. of water, and the last column in that table gives the total net farm business income that can be generated with the help of one mcft. of irrigation water in the case of every crop. The data show that the lowest net income generated with one mcft. of water is from sugarcane (except in the case of the local variety wheat which shows an even lower net income). This clearly demonstrates that an irrigated crop system, in which sugarcane features as a crop, is sure to lead to a lower generation of net total

income, than an irrigated cropping system without sugarcane. A number of such cropping systems, with seasonal crops other than sugarcane, can be worked out, keeping rotational requirements in view. (These are not being presented here, to avoid too many details.)

The important point to note in this connection is that if any of the many seasonal crop combinations/rotations are adopted in place of sugarcane, not only will the net total income from the given quantum of water be higher; it will cover a wider net irrigated area than sugarcane as well. If seasonal crops are to cover the field for all the time for which sugarcane stands on the field (that is, 18 or 12 months depending on the variety), meaning, if a piece of irrigated land is to be under one or another seasonal crop in all the three seasons of the year, then the net irrigated area with only seasonal crops will be 50 to 90 per cent more than the area under sugarcane. If, however, irrigation is confined to only two seasons, (*i.e.*, roughly 8 months) *kharif and rabi*, and no water is provided for any summer crop; the net irrigated area shall be more than three times what sugarcane will cover, for the same quantity of irrigation water. In brief, it means this changed pattern will cover a much larger cultivated area with irrigation than a system based on sugarcane. It was seen in the

beginning that based on the present pattern of cropping under irrigation, no more than 34 per cent of the cultivated land in the State is likely to be irrigated. A changed pattern of cropping can increase this to more than 50 per cent of the total cultivated area. This would bring many more farmers within the fold of irrigation. And it would render greater stability to the agriculture of the State which has seen very little of it till now.

#### **RATIONALE FOR SUGARCANE-BASED IRRIGATION SYSTEM**

The question may be raised: why has the sugarcane-based irrigation system developed, in the State over this century? Why do farmers prefer sugarcane to other seasonal crops under irrigation? Turning to the first question first, it is worth recalling that the earlier canal system in dry Western Maharashtra was the Nira Canal system. This, and the later ones, were originally designed to provide irrigation water to the traditionally grown seasonal crops. But, experience showed very poor use of the water by the farmers for the purpose, except in years of severe drought. The reason, as the late Shri M. Visweswaraya pointed out at that time, was that while these seasonal crops yielded more under irrigated condition, their costs of production under irrigation

were also proportionately higher, leaving no more farm business income than under unirrigated condition.<sup>2</sup> Because of this disincentive, the sugarcane 'block' system, with assurance of water to the block for a number of years at a time, was introduced to persuade the farmer to use irrigation water. Besides other factors, this was the most important reason for the adoption of the sugarcane-based irrigation system. But in recent years the situation has changed. The new varieties of seasonal crops and the relative price situation have made it possible for the farmers in this region to earn a much larger farm business income from even seasonal crops like jowar and bajra under irrigation, than under unirrigated condition.

Nevertheless, the present day farmers in the irrigated areas give other reasons for their preference for sugarcane. There is much less fluctuation in both yield and the price of sugarcane, than of other seasonal crops, due to both weather, and pests and diseases. While this is generally true, it does not appear that lower yield rates of seasonal crops, or much higher relative prices of sugarcane, would give

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2. Refer to Minutes of Evidence: Bombay Presidency (of the Indian Irrigation Commission), Office of Superintendent, Government Printing, Calcutta, 1902. Donald W. Attwood on the history of the Deccan Canals in his paper "Irrigation and Imperialism: The Causes and Consequences of a Shift from Subsistence to Cash Cropping", awaiting publication in *Journal of Development Studies*, 1986.

rise to a higher farm business income from sugarcane than a proper combination of seasonal crops, grown with the help of a given quantity of water. Sensitivity analysis by assuming the lowest yield rates for seasonal crops, and highest relative price of sugarcane, observed over the past decade (not presented here) bear this out. Of course, it is true that the seasonal crops are subject to greater price fluctuations than sugarcane. But a part of the reason is the inadequate provision to implement the support price policy in the local markets at the appropriate time, a failure not noticed in the case of sugarcane, thanks to the factories ensuring the minimum support price for the farmers.

Another reason for the reluctance of farmers to grow seasonal crops in preference to sugarcane, is the uncertainty of water supply from canals and the longer gap between two waterings than what some seasonal crops would appropriately need. Here, again, sugarcane can stand these uncertainties better than most seasonal crops. It is expected that the Rotational Water Supply System now being gradually extended under the Command Area Development projects, will take care of this, aspect of the problem.

#### **ALTERNATIVE APPROACH TO THE USE OF SURFACE IRRIGATION WATER**

The preference of the farmers for

sugarcane is due to the lesser risks involved and the lesser continuous attention required than for other seasonal crops. The farmers sum it up by referring to sugarcane as the 'idleman's crop'. It is difficult to correct this attitude except by adopting a policy such that a farmer can choose to grow sugarcane only at significantly higher cost to himself. This can be done if the total quantity of irrigation water that can be made available per acre in the command area is first calculated on the basis of the cropping pattern(s) likely to generate the highest income per unit of water. Then, depending upon the total cultivated land with a farmer in the command area, his quota of water may be decided, and only so much is assured to him under the Rotational Water Supply System. A farmer who with this given quantum of water, chooses to grow sugarcane, cannot irrigate most of his land under command, and would receive a lower total income than otherwise. Farmers would learn, sooner or later; it is not desirable, nor practicable to enforce a particular cropping pattern on the farmers. Of course, the pattern of cropping under any particular minor canal or water-course (covering a *chak* of about 20 acres) cannot vary widely during a season; for, operation of the system would, in that case, become difficult and

wasteful. But this is a problem common to any pattern of water use, and has to be independently handled.

Attention may be turned to two other aspects of this alternative approach to the use of irrigation water in the type of farming in regions like the plateau region of Western Maharashtra. The alternative use pattern discussed above would cover a much larger net irrigable command area than otherwise. This would require longer canal, distributaries, etc., involving both greater capital cost and proportionately larger loss of water through seepage. (On the other hand, confining irrigation to only the eight months of the *kharif* and *rabi* seasons would mean prevention of considerable loss of water through evaporation in summer.) This would increase the cost of water and one has to take that factor into account in estimating the overall benefits and costs. While we have not done such an exercise (in the case of the Pravara canal system or similar older systems, a part of the additional capital cost may not be necessary since the carrying channels of the past may exist, though in a run-down condition due to want of use), there is evidence to believe that despite this extra

capital cost the benefit-cost ratio will be higher than in the case of the sugarcane-based system.<sup>3</sup>

Finally, a question may be raised about the implication of refusing canal water for sugarcane under the flow irrigation schemes in the whole of the Deccan plateau. This, it may be argued, would lead to a reduction, or at least non-increase (if the policy is followed only in the new irrigation project areas) in the area. Under sugarcane in the region. And this is sure to affect the relative price of sugar (and sugarcane) pushing it upwards. The whole logic based on a given relative price of sugarcane may then indicate a reversal of the policy. Now, this view is logical; but whether the changing relative price of sugarcane will warrant a reversal of the policy implied here will depend on the extent to which the relative price of sugarcane may rise as a result of this. As we have noted earlier, sensitivity exercises using a much higher relative price of sugarcane, almost 15 to 20 per cent higher than assumed in the above exercise, could not justify the use of irrigation water for sugarcane.

However, to conclude that effective denial of canal water for sugarcane would result in no cultivation of the crop in and

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3. For an examination of this question, see V. M. Dandekar, D. Deshmukh and V. R. Deuskar: Interim Report of the Committee to Study the Introduction of Eight Monthly Supply of Water on Irrigation Projects in Maharashtra, Government of Maharashtra, Bombay, 1979.

near the command area, 'appears unwarranted. A significant part of the sugarcane in the region is grown with water from wells. These wells are sunk not only adjacent to the canal irrigated area, but also in some projects, like the non-perennial portion of the Nira Left Bank 'Canal,' within the irrigable command area itself, to tap and recycle the water seeping underground from the canals as well as' the fields. Indeed, the Maharashtra Irrigation Commission (1962) had advocated a policy of permitting and persuading farmers to sink wells in the command area of canal irrigation projects to supplement the irrigation water from canals for crops like sugarcane, and restricting the supply of a flow irrigation water to only a limited number of irrigations required for seasonal crops. The experience in the Deccan suggests that this is possible, and sugarcane can be grown in a significant, measure with the help of wells largely recycling water seeped from canals. It would also lead to a more economical use of the, total canal water an objective that must be pursued to the maximum extent possible in this region deficient in water. It is possible that cultivation of sugarcane only under wells in, and around canal areas would lead to a dispersion of its cultivation over the wider irrigable area, is against the present pattern of concentrated cultivation of sugarcane. There is no reason to believe that this will raise the

cost of production of sugar; if anything, it might reduce it. And, to the extent this happens, the upward pressure on the relative price of sugar and sugarcane will be lessened.

This review of the economics of the present pattern of use of surface irrigation water in the potentially water-short dry agricultural regions of the Deccan plateau, suggests that the water is not being used in a manner that can yield the maximum net income per acre-inch of water. Sugarcane is the smallest income generating crop. Use of canal water for seasonal crops would lead to generation of higher aggregate income from the given amount of water. At the same time, it would lead to larger areas of land being brought under irrigation than is possible under the present pattern of use. This increase would be very considerable if irrigation is confined to only the *kharif* and *rabi* seasons. A much larger proportion of farmers in the State will automatically become beneficiaries of irrigation. The agricultural economy of the State will see greater stability in terms of year to year variations. And, conjunctive use of surface and ground water would promote economic use of scarce water while permitting cultivation of crops like sugarcane (and paddy, where appropriate). Until now, the formulation and/or evaluation of the economics of irrigation projects in India, in published

form, do not appear to contain an particularly important. It is high time examination of the question of the most policy is oriented to this end in the interest economic use of water under different of generation of higher incomes from crop systems. For the water-scarce pla- irrigation and its more equitable distri- teau region of peninsular India this is bution among the rural population.

**Appendix 1. Present (1980-81) and Ultimate Potential Irrigated Area (Gross and Net), as Proportion of the Estimated Total Crop Area (Gross and Net) in India**

1. Gross cropped area	173.324 million ha.
2. Net cropped area	140.270million ha.
3. Gross irrigated area (1980-81)	49.585 million ha.
4. Net irrigated area	38.805 million ha.
5. (3) as per cent of (1)	28.61 %
6. (4) as per cent of (2)	27.66 %
7. (4) as per cent of (3)	78.26 %
8. Ultimate potential irrigated area (gross)	113.5 million ha.
9. (8) Minus (3)	63.915 million ha.
10. Net irrigated area out of the additional gross irrigated area (9) x (7)	50.020 million ha.
11. Ultimate potential net irrigated area (4) plus (10)	88.825 million ha.
12. Ultimate potential gross cropped area (1) plus (9) minus (10)	187.219 million ha.
13. Potential gross irrigated area as per cent of total gross cropped up	60.6 %
14. Potential net irrigated area as per cent of total net cropped area	63.23 %

Source: Data relating to 1980-81 are taken from Indian Agriculture in Brief, 20th Edition, Directorate of Economics and Statistics, Ministry of Agriculture and Rural Development, Government of India, New Delhi, 1985, and the ultimate potential figures are taken from Seventh Five Year Plan, 1985-90, Vol. II, Planning Commission, Government of India, New Delhi, Table 3.1.



**Appendix 2. Present (1982) and Additional Potential Irrigated Cropped Area in Maharashtra from State Sector Surface Irrigation Sources**

(area in '000 ha.)

District	Irrigation potential created (upto June 1982)	Additional potential irrigated crop area	Total (2+3)	Total irrigated area as percent of net sown area (1978-79)
(1)	(2)	(3)	(4)	(5)
1. Greater Bombay	-	-	-	-
2. Thane	8.39	129.83	138.22	52.14
3. Raigarh	23.32	138.21	161.53	82.50
4. Ratnagiri	4.70	139.97	144.67	40.60
<b>Konkan</b>	<b>36.41</b>	<b>408.01</b>	<b>444.42</b>	<b>54.38</b>
5. Nashik	113.36	68.23	181.59	20.41
6. Dhule	64.55	51.47	116.02	16.46
7. Jalgaon	106.31	232.97	339.28	41.86
8. Ahmednagar	206.56	126.08	332.64	27.38
9. Pune	133.86	77.10	210.96	21.07
10. Satara	97.63	127.77	225.40	38.47
11. Sangli	75.41	115.48	190.89	30.98
12. Solapur	142.61	156.03	298.64	26.26
13. Kolhapur	59.53	192.83	252.36	59.56
<b>Western Maharashtra</b>	<b>999.82</b>	<b>1,147.96</b>	<b>2,147.78</b>	<b>29.09</b>
14. Aurangabad	101.69	143.23	244.92	20.17
15. Parbhani	135.01	150.52	285.53	28.35
16. Beed	73.23	139.75	212.98	26.31
17. Nanded	87.56	205.87	293.43	40.31
18. Osmanabad	69.96	88.51	158.47	14.21
<b>Marathwada</b>	<b>464.45</b>	<b>727.88</b>	<b>1,192.33</b>	<b>24.46</b>
19. Buldhana	32.77	65.95	98.72	14.48
20. Akola	43.41	40.25	83.66	10.19
21. Amravati	14.25	119.76	144.01	19.92
22. Yavatmal	40.88	291.22	332.10	38.86
23. Wardha	27.62	155.54	183.16	41.44
24. Nagpur	68.11	261.52	329.63	58.29
25. Bhandara	132.56	325.90	458.46	118.06
26. Chandrapur	79.39	462.13	451.52	78.39
<b>Vidarbha</b>	<b>438.94</b>	<b>1,723.27</b>	<b>2,161.21</b>	<b>41.83</b>
<b>Maharashtra</b>	<b>1,939.62</b>	<b>4,006.12</b>	<b>5,945.74</b>	<b>32.59</b>

Source: Col. 2 from Table 7.4; col. 3 calculated on the basis of data in Tables 7.4 (col. 2), 7.5 (col. 2) and 7.7 (cols. 3 and 4); col. 5 is col. 4 expressed as a percentage of data in col. 5 of Table 7.3 of the Report of the Fact Finding Committee on Regional Imbalance in Maharashtra, Government of Maharashtra, Bombay, April 1984.

**APPENDIX 3**  
**Present (1982) and Additional Potential Irrigated Area in Terms of Rabi (Jowar) Equivalent**  
 (area in '000 ha.)

District	Irrigation potential under construction and future	Upto June 1982	Total (2+3)	Net sown area (1978-79)	Col. (4) as per cent of col. (5)
(1)	(2)	(3)	(4)	(5)	(6)
<i>(Rabi jowar equivalent)</i>					
1. Greater Bombay	-	-	-	6.60	-
2. Thane	261.52	16.90	278.42	265.10	105.40
3. Raigarh	283.60	47.85	331.45	195.80	169.28
4. Ratnagiri	252.24	8.47	260.71	356.30	73.17
<b>Konkan</b>	<b>797.36</b>	<b>73.22</b>	<b>870.58</b>	<b>817.20</b>	<b>106.53</b>
5. Nashik	113.11	187.93	301.04	889.60	33.84
6. Dhule	94.21	118.15	212.36	705.00	30.12
7. Jalgaon	481.55	219.74	701.29	810.50	86.53
8. Ahmednagar	256.65	420.48	677.13	1214.90	55.74
9. Pune	165.49	287.34	452.83	1001.00	45.24
10. Satara	277.05	211.74	488.79	585.90	83.43
11. Sangli	299.76	195.75	495.51	616.10	80.43
12. Solapur	345.92	316.17	662.09	1137.40	58.21
13. Kolhapur	798.28	246.44	1,044.72	423.70	246.57
<b>Western Maharashtra</b>	<b>2,837.79</b>	<b>2,203.74</b>	<b>5,041.53</b>	<b>7384.10</b>	<b>68.28</b>
14. Aurangabad	258.89	183.81	442.70	1214.00	36.47
15. Parbhani	376.35	337.57	713.92	1007.30	70.87
16. Beed	237.07	124.23	361.30	809.50	44.63
17. Nanded	424.43	180.52	604.95	727.90	83.11
18. Osmanabad	144.32	109.18	253.50	1115.00	22.74
<b>Marathwada</b>	<b>1,441.06</b>	<b>935.31</b>	<b>2,376.37</b>	<b>4873.70</b>	<b>48.75</b>
19. Buldhana	130.68	64.93	195.61	681.90	28.69
20. Akola	80.94	87.30	168.24	820.70	20.50
21. Amravati	202.38	24.08	226.46	722.90	31.33
22. Yavatmal	601.82	84.48	686.30	854.60	80.31
23. Wardha	307.20	54.55	361.75	442.00	81.84
24. Nagpur	402.21	104.75	509.96	565.50	90.18
25. Bhandara	420.36	170.98	591.34	388.30	152.29
26. Chandrapur	547.34	93.97	641.31	690.80	92.84
<b>Vidarbha</b>	<b>2,713.90</b>	<b>684.74</b>	<b>3,398.64</b>	<b>5166.70</b>	<b>65.78</b>
<b>Maharashtra</b>	<b>7,790.11</b>	<b>3897.01</b>	<b>11,687.12</b>	<b>18241.70</b>	<b>64.07</b>

Source: Tables 7.5, 7.6 and 7.7 of the Report of the Fact Finding Committee on Regional Imbalance in Maharashtra, *op. cit.*

# TEACHING OF AGRICULTURAL ECONOMICS: REPORT ON DISCUSSION

Nilakantha Rath\*

On the occasion of the Golden Jubilee celebrations of the Indian Society of Agricultural Economics, the Society decided to hold a special session to discuss problems of teaching agricultural economics at the under-graduate and post-graduate levels in the Agricultural and non-Agricultural Universities in India. Two invited papers, one relating to teaching in the Agricultural Universities, and the other relating to teaching in the post-graduate departments in non-Agricultural Universities printed in this issue provided the basic background to the discussion that followed.

The discussions were at two levels; on the general themes, and specific to the individual papers. Where the authors have taken account of the specific comments made in revising their papers for publication, these comments are not referred to in the summary of discussions below.

The discussion began by noting that the approach to the study of the agricultural economy in India had been essentially empirical. Historically, the enquiries by the successive Famine

Commissions, the primary household and village level enquiries by Major Jack in Bengal, Dr. Harold Mann in Bombay, Dr. Gilbert Slater in Madras, the enquiries by the Punjab Board of Economic Enquiry, the surveys of rural indebtedness and credit enquiries in various provinces, the marketing reports of the Office of Marketing Advisor, and the stream of village surveys in the 1920's, 1930's and 1940's, underline this empirical orientation. Prof. Leonief's appreciation of this orientation of the American agricultural economists may also be said to hold true in the case of the Indian agricultural economic profession.

But, it was pointed out that while most of our studies were empirical and quantitative to a very high degree, they were, unfortunately, not always analytical, or analytical enough. This may have been mainly due to our training at the University level.

Teaching of analytical methods in economics in the Agricultural Universities at both the under-graduate and even the post-graduate levels was heavily centred on production economics. It was pointed out that this was mainly due to

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*Note:* Report on the discussion in the Special Session on Teaching of Agricultural Economics at the Golden Jubilee Conference of the Indian Society of Agricultural Economics at Bombay on 7th December, 1989. - Ed.

the emphasis in the statutory mandates of these Universities to produce farm planners and extension workers. The rest of micro-economic analysis was neglected to a greater extent. There was a strong need for adequate training in micro and macro-economic analysis to students of agricultural economics, particularly at the post-graduate level. Some post-graduate students who participated in the discussion were very emphatic on this, and stated that such minor provision as may have been made in the existing syllabi of the Universities, was invariably neglected in the class.

In the General Universities, it was stated that agricultural economics was regarded by the students essentially as a descriptive subject; and the actual content of teaching in the class-room or the pattern of questions in the examination did little to correct this distorted understanding. There was general support for the contention of Professors Deshpande and Sawant on this score, though opinion was divided on the alternative approaches suggested by them for improving the situation.

The second aspect of teaching about which there appeared considerable dissatisfaction related to the teaching and application of empirical methods. While in the Agricultural Universities, there was considerable emphasis on this at the

Master's level, many maintained that the use of these methods by the learners was often very mechanical. There was no emphasis in teaching to apply tools discriminatively, to use only relevant tools for the task on hand and not bring unnecessarily heavy tools to handle analytical problems that can be better handled with simpler ones. In part, some felt, this arises due to lack of application of these tools to real world data in the class-room. Indeed, it was felt that the massive body of empirical information relating to Indian agriculture rarely seemed to find its way to our class-rooms. No wonder there is a general lack of critical judgment about the relevance of the available empirical information for the analytical frame. These are tasks which need to be handled at the post-graduate and research degree levels, if poor quality of the human product and frustration are to be avoided. At the General Universities, most students of agricultural economics were innocent of even elementary quantitative methods. Use of these methods in teaching and analysis would force them to learn these, since facilities for training in quantitative methods were available almost everywhere.

Some discussants from the Agricultural Universities said that economics has a relatively lower status at the under-graduate level: only 6 universities

have a provision for Honours course in economics. At the Master's level job-oriented programmes like agricultural production, marketing and finance attracted main attention. Policy oriented subjects and analytical methods stood to suffer through relative neglect. And, finally, students, irrespective of their preparedness, insist on completing their degree in two years and the administration also thinks likewise. No wonder, the product is often ill-equipped.

Another aspect discussed related to the knowledge of technical agriculture in broad terms and its use in economic analysis. The students of Agricultural Universities of course had adequate knowledge of this; but there was little evidence of this in their analysis of economic aspects of agriculture. On the other hand, there was general ignorance about this amongst the students in the M.A. (Economics) class (even when they came from agriculturist families), and amongst the students of urban origin the ignorance was phenomenal. Several suggestions were made to devise ways of making the M.A. students informed about technicalities of agriculture in a broad way, though it was felt that mere visit to farms and Agricultural Universities cannot fill this gap. As for the students of Agricultural Universities, it was suggested that the relation between technology and

economics should be clearly demonstrated in the course of teaching, and the research students should be made to check these at the farmer's level rather than merely hypothesising about them in their analysis.

Divergent views were expressed about the prevailing situation in Agricultural Universities. While some felt that the model teaching scheme formulated by the ICAR for the purpose should be given a fair trial, others felt that no uniformity should be imposed and departments should have freedom in the matter. In this connection, the changes in syllabi in the Indian Agricultural Research Institute over the past many years were referred to, but IARI appeared to be an exception rather than the rule in this matter.

Similarly, divergent views were expressed about the quality of teachers in the Agricultural Universities. While a few thought that there were well qualified teachers to teach analytical subjects who, however, were being used in a large measure in other tasks, a very wide body of opinion was dissatisfied with the training, background and competence of many teachers.

Two suggestions emerged in this connection: (1) There should be a deliberate policy of recruiting a certain percentage of teachers who had their

post-graduate training in other universities, including in non-agricultural universities, of course on a reciprocal basis, in order to avoid excessive in-breeding. In this connection, it was thought that the centralised examination by the ICAR to recruit teachers for Agricultural Universities and by the U.G.C. for the General Universities might help. (2) Most participants felt that periodic refresher courses for University teachers in their respective subjects were absolutely necessary. There was a persistent suggestion that the Indian Society of Agricultural Economics should take initiative in the matter.

Another aspect on which also there was wide consensus was the need for relevant teaching material. While a few participants said that there was good teaching material made available by their institutions to students, based on research in the departments, most participants were unhappy with the inadequate and rather unsuitable teaching material available. In this matter also, the Society, amongst others, was requested to take initiative.

In regard to the General Universities, some felt that the two-paper course designed by Profs. Deshpande and Sawant might prove too heavy, and needed appropriate pruning. They also mentioned inadequate access to literature for students in many Universities. Quality literature in regional languages, which have become the medium of learning in many universities, was conspicuous by its absence. In this connection, the provision of external examinees (who were not regular students) caused greater strain inasmuch as their background and access to literature being poor, they succeeded in pulling down the general level of performance expected.

There was very wide participation in the discussion. Speakers ventilated their sense of unhappiness with the existing state of affairs. The special session provided a forum for unburdening one's dissatisfaction and in this sense the session was a useful beginning. This needs to be followed up with some concrete measures for improving teaching of agricultural economics in India. This is imperative because for a long time to come the demand for professionally trained agricultural economists is bound to remain significantly high.

# POVERTY IN INDIA REVISITED

Nilakantha Rath\*

This paper is about poverty in rural India, the methods of its measurement and its dimensions during the last three decades. Section I traces the beginnings of this enquiry in 1970-71. Section II discusses the objections raised to the calorie based measurement of the poverty line. Section III traces and critically examines the methods of measurement subsequently followed, over space and time. Section IV presents the dimensions of rural poverty in India and its major states during the last three decades. Section V briefly examines the causes of the rising incidence of poverty and the policy measures to contain it.

## I

### ORIGIN AND NATURE OF ENQUIRY

India's proverbial riches had attracted hordes of invaders from outside through ages. But during the last hundred years or more, scholars, public men and sensitive administrators had noted the poverty of and in India. While all of them recognised the great inequality of wealth and income amongst the people of India, there had been little effort at quantifying the poor amongst the people. One of the earliest to

venture a quantitative statement about the poverty in India was (the late) Dr. Ram Manohar Lohia who made a statement in the House of People (*Lok Sabha*) of the Indian Parliament in the late 1950s about the proportion of Indians who had less than a specified level of expenditure. The Indian planners were, of course, concerned. A Working Group consisting of nine distinguished economists and social workers, set up by a Seminar on Planning, organised by the Indian Planning Commission, recommended in July 1962 that the national minimum per capita consumer expenditure in India should be Rs. 20 (at 1960-61 prices).<sup>1</sup>

The Planning Commission noted that on the basis of available data on distribution of population according to per capita expenditure, nearly half the Indian population in 1960-61 was below this national minimum level of Rs. 20 per capita per month, and the Commission called them poor. But in the absence of any details about the basis of this national minimum the discussion did not proceed further.

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The first draft of this paper was presented in a Symposium on the "Regional State-of-the-Art Reviews on Poverty Research" in Paris, France, from November 30 to December 2, 1994, at the invitation of the Comparative Research Programme on Poverty, University of Bergen, Norway. In revising the paper for publication, I had the benefit of extensive discussions with and suggestions of S. M. Vidwans, formerly Director of Economics and Statistics, Government of Maharashtra and presently Honorary Director, Indian School of Political Economy, Pune, some of which are acknowledged in the text. I am very thankful to him for this. The responsibility for all errors is of course mine. This is my tribute to the memory of late Professor V. M. Dandekar.

In 1970 three scholars wrote on the dimensions of poverty in India. Two of them, Bardhan (1970) and Minhas (1970) started with this national minimum, recommended by the working group. Bardhan, in the absence of any details, did a notional separation of the minimum between rural and urban India. For rural he stipulated Rs. 15 per capita per month and for . urban Rs.25 per capita per month. Minhas used a similar approach. Ojha (1970) attempted a normative basis for fixing the minimum income level. He used a cereal consumption norm based on the total calorie need of a 'reference' Indian, suggested by nutritionists. All households and their members with less than this quantity of cereals were characterised as poor.

An effort at fixing a minimum income, which may be called the poverty line, on the basis of some objective criterion was made by Dandekar and Rath (1971) in their small monograph called 'Poverty in India'. It was, of course, obvious that a minimum level of per capita income (or expenditure) to demarcate the poor from the rest cannot be an immutable one, but will depend upon the level of economic development of the society as well as its climatic environment and social values. For a low income country like India at that time, Dandekar and Rath started with the proposition that a level of income (or total expenditure) that was just able to

ensure adequate food to every member of the household during the year may be considered as such a minimum income, and all households with less income than this may, therefore, be called poor. In order to translate 'adequate food' into some measurable quantitative form, Dandekar and Rath used calories provided by the food used in the household. Sukhatme (1965) had reported that according to nutrition experts (Nutrition Advisory Committee, 1958) an average Indian - average for age, sex, occupation, as well as geographic location - needed food at the retail level in the household that would give him 2,250 kilo (k.) calories per day. This norm was used as the equivalent of 'adequate food'. The minimum protein requirement was not separately taken into account since, given the usual Indian diet, the food that gave adequate calories also provided the minimum protein requirements. No separate norms were considered for the non-food requirements of the household: whatever the observed level and pattern of expenditure on non-food items by the average household with the level of income (or of total expenditure) which permitted it to provide food with 2,250 k.calories on an average to the members of the household, was assumed to be reasonable for the purpose of defining the poverty line.



Given this normative basis in terms of food measured by its calorie content, Dandekar and Rath resorted to behavioral data to find out the level of per capita total expenditure at which the average household was able to provide food with this calorie content. The National Sample Survey Organisation (NSSO) of the Government of India had been conducting annually a consumer expenditure survey, since 1951, in which the sample size was adequate to give the average per capita consumer expenditure for each state as well as the country as a whole within reasonable margin of error. In presenting the Survey results, the sample households were classified according to the monthly (30 days) per capita total consumption expenditure, and the average total per capita expenditure for each expenditure class as well as the expenditures on certain cereals and substitutes and their quantities (which form the major part of food of an Indian) were presented every year. However, the quantity data for other food items were published only occasionally. Dandekar and Rath used the quantity data for cereals and pulses for the year 1960-61 and for all the food items in detail for the year 1961-62 for estimation of the per capita per month expenditure group in different states of India in which the average person was able to get 2,250 k.calories from food. This gave the poverty line in terms of total monetary

expenditure and the percentage of population below the poverty line in each state separately for rural and urban areas. For 1960-61, they found the average consumption of foodgrains, (i.e., cereals and pulses) in the expenditure group Rs. 13-15 (for 30 days) to be about 616 grams per capita per day, giving about 2,030 k.calories. Assuming a supply of additional 200 calories from the other food items consumed by this class they came to the conclusion that the average Indian in rural India needed about Rs. 170 per capita per year in order to be able to consume food giving an average of 2,250 k.calories per day. The population below this level of per capita annual expenditure could, therefore, be considered poor.

The statewise detailed calculation on the basis of all food items was made for 1961-62. Adding up the numbers of the poor in different states it appeared that in rural India 38 per cent of the population lived below the poverty line of Rs. 170 per capita per year. For different states the line as well as the percentage of the population below the poverty line varied greatly. The data are reproduced in Table 6 for rural India. (The data for urban India are not presented and discussed in this paper.) The overall percentage of the total Indian population, both rural and urban, below the poverty line was estimated at 40 per cent in 1961-62.

It would be useful to mention here that while the Planning Commission's Working Group (1962) had suggested Rs. 20 per capita per month as, what later came to be called, the poverty line for rural India and Rs. 25 for urban India, Dandekar and Rath found it to be about Rs. 14 per capita per month (30 days) for rural India and Rs. 22.5 per capita per month for urban India in 1961-62. In deference to the Working Group's recommendation for rural areas they put the poverty line for rural India as a whole at Rs. 15 per month or Rs. 180 per year.

## II CRITICISM ON CALORIE BASED MEASUREMENT OF POVERTY LINE

This exercise by Dandekar and Rath, which used a normative basis, in terms of 'adequate food' intake for determining the poverty line, drew wide attention and was subjected to many criticisms. Some of the criticisms may be briefly noted here.

(i) Two objections to Dandekar-Rath's calorie norm to determine the poverty line in terms of total consumption expenditure were as follows:

(a) Dandekar-Rath specified the calories irrespective of the composition of food by the sampled households, instead of specifying the norm in terms of a 'balanced diet'.

(b) It was argued that poverty should,

properly speaking, be defined in terms of deficiency in the total level of living, and not mere calories obtained through food.

While many critics raised these and similar objections, Rao (1977) is the most distinguished and articulate amongst them. Dandekar (1981) examined these at length and his propositions are summarised below:

(a) Rao said, "A balanced diet approach is... preferable to the calorie intake approach", and expressed his preference for such approach followed by Bardhan (1974) and Rudra (1974). Surely, there can be no objection to a balanced diet norm for determining poverty line. Of course, there are different balanced diets recommended for the Indian population, one a vegetarian and another with meat, fish and eggs in the diet. Apart from the problem of choice between the diets, the major question is its operational significance in drawing the poverty line. In practice, it will not be easy to satisfy oneself item by item on the actual consumption of the various constituents of a balanced diet. Whatever the composition of the balanced diet, operationally the only meaningful way to take account of it is to convert it at current prices into total money value (or to calories) to ascertain the total expenditure level at which this level of expenditure on food is incurred. This is what Bardhan and Rudra have done in their exercises. Thus, in the final

calculation, the composition of the balanced diet is abandoned, and only its aggregate cost is retained. Consequently, it is difficult to see that this is an improvement over the method which ensures that the households on the poverty line have the specified calorie intake, particularly if we see that a diet adequate in calories is almost always also a balanced diet" (Dandekar, 1981, p. 1242).

(b) Secondly, some, mistakenly, think that this poverty line takes only food into account. In fact, it takes the total expenditure of the household (and, therefore, per capita) into account. The only point is that while for food there is a norm imposed in terms of required calorie intake, for non-food there is no norm; whatever is spent in such expenditure group on non-food is accepted. Rao, however, goes further and says, "Poverty has to be identified with deficiency in the total level of living. And, total level of living includes not only energy requirements but also balanced diet needed for health, and the other basic needs essential for human existence at a tolerable level." As he notes, no one has done this. But it is not easy to translate this 'tolerable level of human existence' into many different commodities and services. And, even when it is done, like in case of the balanced diet, operationally it has to be translated into a total expenditure in order to draw the poverty line.

(ii) The second set of objections to the Dandekar-Rath approach related to the choice of the specified calorie level for determining the poverty line. Here, there were two different types of objections. The first, made by Rao (1977) noted that in the consumption survey by the NSSO in 1971-72 there were many households below the expenditure level corresponding to an average of 2,250 k.calories intake who would be called poor but who in fact obtained 2,250 k.calories or more from the food they consumed, while in the expenditure categories above the poverty line so determined there were many households who obtained less than 2,250 k.calories per capita per day from the food they consumed. Rao found this perplexing: that some poor were over-nourished where as some non-poor were undernourished. Consequently, he considered the procedure followed by Dandekar-Rath as not correct. As Dandekar (1981) has pointed out, Rao's difficulty in this matter arose out of a confusion between poverty and under-nutrition. To quote Dandekar in this respect: "Want of adequate income, howsoever defined, is poverty; deficiency of energy, appropriately defined, is under-nutrition." The proper way to interpret the poverty line income is that the population living on levels of income lower than this "lived on such levels of consumer expenditure that, judged by

average standards of household management, it could not provide for itself diet adequate even in respect of calories. There would certainly be some households among the poor, defined by a certain expenditure level, who with better household management and better priorities of expenditure did provide for themselves diets adequate at least in respect of calories. The-contrary is also true." "There is nothing paradoxical in this. Indeed poverty and under-nutrition are two different, though related phenomena" (Dandekar, 1981).

Sukhatme (1978) also appears to make the same confusion between poverty and under-nutrition when he compares the Dandekar-Rath approach with that by Arthur Bowley for England. As Dandekar (1981) has pointed out, Dandekar-Rath used the classification of the household on the basis of per capita monthly expenditure which was relevant for calculating incidence of poverty, and not according to per capita calorie availability which is relevant for under-nutrition.

But Sukhatme (1978) had a different objection as well, an objection to the use of 2,250 k.calories per capita as the requirement of an average Indian. Sukhatme says that "this is an average, and around this average there is a distribution of individuals according to their per

capita calorie intake, a part of which is because of inter-individual and another part due to intra-individual variation in energy needs. Inter-individual variation means that the energy intake of even normally healthy and active individuals with similar body weight and occupation varies, implying that some individuals are more efficient machines than, others. Intra-individual variation means that energy intake of an individual engaged in similar activity and maintaining body weight varies from day to day." It is only such individual variations other than what is normal (in the statistical sense) around the mean that can be considered, at the lower end of the mean, to be having less calories than needed. Using this logic Sukhatme says that the 'minimum' calorie needs of a reference Indian (a consumer unit) will not be 2,750 k.calories (approximately equivalent to 2,250 k.calories per person), but 2,300 k.calories per consumer unit. And, therefore, on the basis of the consumption survey by the NSSO in 1971-72, the percentage of the poor in rural India will not be 46.6 per cent as would be the case following Dandekar-Rath method, but only 20 per cent. Dandekar (1981) accepted Sukhatme's legitimate point about inter- and intra-individual differences about calorie needs. But thereafter Dandekar's differences with Sukhatme were on grounds of statistical methods followed. The debate has continued, the latest contribution to

this being by Osmani (1992). I have no competence in the field to be able to present a critical summary of the debate so far. For a full account of the debate the interested reader is referred to Sukhatme (1977, 1978), Dandekar (1981, 1982), and Osmani (1992).

However, in a personal discussion, S. M. Vidwans pointed out two aspects of this debate which I would like to bring to the attention of the reader. In the first place, Sukhatme states the mean required calories of a consumer unit to be 2,750 k.calories with its standard deviation as 450 k.calories. These relate to an observed random population. The NSSO survey gives the average per consumer unit calorie intake of a household. Therefore, Sukhatme says, its standard deviation should be divided by the square root of the total number of consumer units in the household (4) which is two, making the standard deviation of the average consumer unit of the household 225. And, Sukhatme deducts twice the standard deviation (450) to arrive at the minimum calorie need of a consumer unit in the household, which becomes 2,300 k.calories. Vidwans says that Sukhatme, as well as Dandekar who agreed with him, assume the group of consumer units in the household to be a random sample from the population which alone will justify the standard deviation being divided by the square root of the total

number of consumer units for the purpose. But, says Vidwans, to estimate the standard deviation of the average calorie requirement of a member of a household it may not be quite proper to treat the different members of a household to constitute a random sample. Even if the husband and the wife may be considered as such, i.e., random individuals, the children cannot be considered such for the specific purpose in hand, namely, estimating the calorie requirement. There could be a high correlation between either or both of the parents and the children in this matter. Therefore, if this correlation is very high, then there may be in effect, in an extreme case, only two random units in the household, the square root of which is approximately 1.4. If this is correct, the minimum calorie requirement would be, not 2,300, but  $(2,750 - 643 =) 2,107$  k.calories. This, applied to the NSS data for 1971-72, which Sukhatme used, would bring down the percentage of the rural consumer units that are poor to 15 only (not 20 or 32 per cent as Sukhatme or Dandekar calculated on the basis of Sukhatme's estimated standard deviation)!

Further, the percentages of the rural poor, calculated by either Sukhatme or Dandekar POVERTY IN INDIA REVISITED<sup>81</sup> or even our above estimate of 15 per cent, on the basis of the data presented in the NSSO Report. No.

238 on the 26th Round of the Consumer Expenditure Survey (1971-72), are incorrect. Vidwans drew my attention to the fact that unlike in the reports of most other rounds of the Consumer Expenditure Survey, the report on the 26th Round presents only the distribution of the sample households among the different expenditure categories, while what is needed is the estimated number of households (or persons) in every expenditure category. The percentage distribution of the sample households (or persons) simply cannot give the correct position because the sample design was not a self-weighting one. Unfortunately, there is no way the reader can make this estimation. Therefore, the 26th Round data cannot be used for the purpose of estimating the percentage of the poor in 1971-72.

A Task Force of the Indian Planning Commission on Projections of Minimum Needs and Effective Consumption Demand, reporting in January 1979, did not find the 2,250 k.calorie norm for an average person suitable and suggested a different one - indeed two different norms, one for rural and the other for urban. India. The Task Force said, "As far as Dandekar and Rath study is concerned, their basis to arrive at the adequacy of 2,250 calories per person per day both for rural and urban areas is not clearly spelt out. They do not seem to have taken into

account the fact that nutritional requirements in terms of calories are at least age, sex and occupation-specific. And, as such, they are likely to vary sizeably between rural and urban areas especially because population in the former, proportionately speaking, is likely to be more engaged in manual activities" (Planning Commission, 1979, p. 5). The Task Force used the age-sex-activity specific calorie allowances recommended by the Nutrition Expert Group (of India), 1968, projected the age-sex composition of the rural and urban population of India in 1982-83, and obtained their occupational distribution on the basis of that from the Census of 1971 supplemented by the participation rates based on usual activity status of the rural and urban population as seen from the NSS 27th Round (1972-73) report on employment. On the basis of these data, and attributing the different Census-defined occupations to the different age-sex-activity based calorie needs recommended by the Nutrition Expert Group, the Task Force arrived at two different norms, one for an average rural Indian and the other for an average urban Indian person (not consumer unit), 2,435 calories for the former and 2,095 calories for the latter.

Estimation of separate norms for rural and urban India was a distinct improvement on Dandekar and Rath's (1971) uniform nutritional norm of 2,250

k.calories. Dandekar and Rath used Sukhatme's (1965) estimate, which in turn was based on what an earlier Nutrition Advisory Committee had recommended in 1958.<sup>2</sup> This had taken age and sex distribution into account (Sukhatme, 1965, Table 1.2). As for activity, while the Committee had separate estimates for three different types of activity - sedentary occupation, light industrial work (moderate activity), and heavy work, separately for men and women - it used, for the working population as a whole, the middle category of moderate work for estimating the calorie needs of a 'reference' Indian. The 'reference' Indian was of 20-29 years of age, and for the subsequent age groups appropriate deductions in nutrition need were made. It is, therefore, not right to say that the calorie norm of 2,250 did not take the age and sex distribution of the population into account, nor is it quite correct to say that no account of occupational pattern was taken. Of course, no separate estimates for the rural and urban populations had been made by the Nutrition Advisory Committee (1958) and by Sukhatme and therefore by Dandekar and Rath. In this context, it is useful to remember that the average calorie norm will depend upon which occupation in the Census classification is attributed to which age-sex-activity category for calorie norms worked out by the Nutrition Expert Group of 1968. And, furthermore, the

application of this calorie norm for such an average Indian to the population in any particular per capita expenditure class in order to estimate the poverty line implies that the population in this class has the same activity distribution as the total population, - a rather questionable assumption indeed. Finally, it may be noted that while the Task Force put the norms for the average rural and urban Indian at 2,435 and 2,095 k.calories respectively, a subsequent Planning Commission Committee (1993, p. 45) rounded these off to 2,400 and 2,100 k.calories, respectively.

In a more recent paper, Minhas (1993) has attempted what he calls a behaviouristic approach to the estimation of the calorie level for calculation of rural and urban poverty. He uses the 1983 Consumer Expenditure Survey data of the NSS for the purpose. In this survey, he points out, the meals served to non-members of the household on the occasion of ceremonies and at other times as well as to employees (like casual labourers on farm and non-farm work of the household) were included in the consumption expenditure as also quantities consumed by the household while these occasional diners were not counted as part of the household; similarly, food eaten by the members of the household either as guests or employees of other households were not taken into account

in the consumption of the household to which these persons belonged. Only the meals purchased by the members of the household were included in the household's consumption account. Naturally, calorie estimation of such sample household on the basis of the reported consumption data would not give a correct picture of the total calorie intake by the household. It would be necessary to exclude the meals consumed by the non-members of the household in the household during the month and include the meals consumed by members of the household outside the total consumption basket of the household in order to estimate the level of calorie intake by the members of the household. The 1983 consumer expenditure survey contained information about the total number of meals served to guests and employees of the household and the number of meals consumed by members of the household outside, the meals purchased by them as well as the total number of meals consumed in the household separately during a month. This provides a basis for correcting the food/calorie intake by the members of the surveyed households. Minhas first arranges the surveyed households according to their reported calorie intake, and then adjusts the calorie intake in each group by deducting the calorie value of Meals fed to non-members and adding the calorie values of meals consumed by members in each household to obtain the percentages of households who move to higher calorie groups and households who move to lower calorie groups. Not unexpectedly, the percentage of households moving to higher calorie groups gradually declines as one moves to higher calorie classes, and the reverse trend is observed with the percentage of households moving to lower calorie classes. Minhas considers the calorie level at which the meals received and meals given out by households on an average just balance to be significant. The households above this level are net givers of food and therefore are considered by him to be food abundant households, and those below this level are considered as food deficient households. The poverty line may, according to him, be defined at this 'net zero displacement' level. Naturally, this level varies for different states. For states like Gujarat, Karnataka or Himachal Pradesh this zero net displacement level was seen to be the lowest in the country, lying between 1800 and 1900 k.calories. Minhas considers this to be a level below which any Indian will experience the onset of hunger. This level of calorie intake he puts at 70 per cent of the recommended 2,750 k.calories for a consumer unit. Minhas derives independent support for his estimated poverty line for different states from a separate opinion survey by the NSS in the same



year about whether the household had adequate food during the whole year, part of the year or never.

The just adequate calorie norm obtained by Minhas from the behaviour of the surveyed households does not depend upon any nutritional standards, but is determined by the observed level of calorie intake at which the given and received meals just balance. This is crucial to his behavioural approach. But, a difficulty arises here. The level is noted at that point where the meals given and taken by the households just balance. Now, if the overwhelming proportion of the households were both giving and taking meals, then this approach may turn out to be meaningful. But, if a substantial proportion of the households neither gave nor received meals or only gave or only received meals then the problem will arise. In regard to these later groups of households, can anything be said about the level at which food abundance begins? In the 47th and 48th Rounds of the consumer expenditure survey about 19 per cent of the rural households reported taking any meal outside the household and only 4 per cent reported performing any ceremonies in the household which would involve feeding outsiders. Thus it appears that the overwhelming proportion of sample households neither received nor gave prepared meals. Under such circumstances, it is

difficult to accept the zero net displacement basis of only a small section of the sample population as a basis for ascertaining the food adequacy level of the population.<sup>3</sup> In view of this, it is not necessary to go into the corroborative evidence based on the opinion survey of the consumers, presented by Minhas.

Before turning to the next section, it may be useful to comment on another aspect of the NSS consumer expenditure survey of 1983 and the later years. As seen above, the meals fed to employees are considered a part of the household expenditure of the employer household, and the meals received as a part of their wages by the employees are not included in the household expenditure of the employee's household. Strictly speaking, these meals are a part of the production - not consumption - expenditure of the employer's household, and the receipts of such meals by the employee should be a part of the consumption expenditure of the employee's household. The giving of these meals is a part of the wage agreement - payment partly in cash and partly in kind - and is not in the nature of a perquisite, like a cup of tea, etc., which is not counted as production expenditure. By not treating these meals as production expenditure, the total consumption expenditures of these households have been wrongly calculated. To that extent,

the classification of households according to per capita monthly expenditure, given in these survey reports, is not correct. It is difficult to say clearly if this defect also plagues the results of the earlier rounds of the NSS consumer expenditure survey. In the early rounds of the consumer expenditure survey there was clear instructions to the investigators that any purchased or homegrown item used by the household for productive purposes shall not be included in the accounts on consumption. However, the instructions illustrated it with the example of grain fed to cattle. Nothing was said about meals fed to wage workers. It is possible that the investigators were instructed to keep out the material used in preparing meals for employees from the consumption account. It is possible that the instructions issued during field work answered such questions by some investigators and were circulated to other investigators. A careful examination of the relevant documents of the period can clarify these doubts. The specification of items in some relevant blocks in the questionnaire suggest that such care might have been taken. The instructions issued to investigators during the seventies make a mention of the perquisites, but not about the treatment of meals. If at any stage meals fed to workers were separated from consumer expenditure, then there will be an element of non-comparability between those data and the

later data on consumer expenditure when such given out meals were not excluded from consumer expenditure.

Finally, it may be useful to point out that if the average caloric intake calculated for every consumer expenditure class published for the 1983 consumer expenditure survey is corrected for the average number of meals given out and taken by the households in that class (assuming that this has not been done in the published data), then the average level of calorie intake in the expenditure class containing the all-India poverty line for 1983 would come down by two per cent, leading to an increase in the estimated proportion of the people below the poverty line. It was possible to estimate this from the data in Minhas (1993); but such estimates are not possible for the states without the necessary data.

### III APPROACHES TO MEASUREMENT OF POVERTY

Attention may now be turned to the measurement of poverty during the three decades since 1961-62. The calorie based determination of the poverty line per capita expenditure was calculated with the help of the National Sample Survey Organisation's (NSSO) consumption expenditure survey data. Till 1972-73, the NSSO conducted consumption expenditure surveys every year. But,

routinely only per capita expenditures in money terms on groups of commodities and per capita quantity of individual cereals and substitutes consumed in different expenditure groups were published. Quantity data of every individual food item were rarely published. Therefore, calculation of total calorie intake was not possible every year. From 1972-73 the NSSO decided on quinquennial consumption expenditure survey. (In 1973-74, a special consumption expenditure survey for some ad hoc purpose was conducted during only 9 months of the year.) Since 1988-89, it has resumed annual survey, of course with a much smaller sample, between the quinquennial surveys. However, for the consumption expenditure surveys in 1971-72, 1977-78 and 1983 the NSSO, while not publishing the quantity data on different food items consumed, did the calculation of average calorie intake per consumer unit for every expenditure group and published these. For the year 1987-88, the latest quinquennial year for which such survey data have so far been published, the NSSO published the data on quantity consumed of a number of food items, but did not publish calorie intake data. It may also be remembered that there is a considerable time-lag between the field survey and publication of the suitably tabulated data.

There was widespread interest in the estimation of incidence of poverty and a growing demand for such estimates from year to year. Till 1972-73, due to the absence of quantity data on various items of food consumed in the annual survey reports and subsequently due to the quinquennial surveys, scholars as well as the Planning Commission devised ways of updating the poverty line for a particular year to any later year in order to read off from the available total per capita expenditure data the poverty line at current prices and the incidence of poverty in that year.

Several approaches have been suggested and/or used for the purpose. One is to accept the expenditure on food as a certain percentage of the total expenditure, say 75 or 80 per cent, as the norm and the cut-off line for estimation of the incidence of poverty. Consumer expenditure data show that as total per capita expenditure rises the percentage of expenditure on food declines. Therefore, all households and persons with per capita total expenditure below that at which the expenditure on food is, say, 75 (or 80) per cent, may be called poor. This percentage can be independent of calorie calculations, as Dandekar (1981) suggests, or it may be first based on calorie calculations and in subsequent years applied to distribution of expenditure data without fresh calorie calculations. However, this norm can be a useful one

provided it is stable in its implication about poverty. *A priori*, however, one can think of at least two reasons why it can change significantly keeping the implication about poverty intact. Firstly, significant changes in relative prices of food and non-food components can change this percentage. Secondly, changes in local availability of items of consumption, due to changes in local production pattern as well as changes in consumption habits in the locality over time - all of which economists club under the single expression 'taste' - may bring about changes in the expenditure on food as a percentage of total expenditure. In fact, the actual survey data reveal the great changes in this over a period of 26 years. Table 1 shows the per capita total expenditure on food in the per capita total expenditure class containing the poverty line, demarcated on the basis of calorie content of food at 2,250 k.calories per person, as a percentage of the total expenditure in that class in the four year 1961/62, 1977-78, 1983 and 1987-88, in all states of India and in India as a whole. It is clear from the table that this percentage steadily declined in the successive survey years in every state. By 1987-88 the expenditure class containing the poverty line recorded a significant lower percentage of expenditure on food than the corresponding class in 1961-62. Indeed, how-great was the change in this is indicated by the fact that in 1987-88

the average per capita expenditure on food as a percentage of total expenditure in the lowest per capita expenditure class was much lower than the similar percentage in the expenditure class containing the poverty line in 1961-62. The unreality of using the percentage of expenditure on food in 1961-62 as a criterion demarcating the poor in the next 2-3 decades becomes clear from this. It is also useful to note that this percentage differed from state to state in both 1961-62 and in all subsequent years.

A Second approach suggested to identify the poor is in terms of the quantity of foodgrains consumed per capita. Indeed, in the absence of detailed physicals data on consumption of items of food other than foodgrains in 1960-61, Dandekar and Rath used the total foodgrains consumed per capita per day as the norm for identifying the expenditure class and the poverty line. For this purpose, they used the all-India data. But it is not necessary to point out that this quantum was different in different states at their poverty lines, as the 1961-62 data, used by them, would show. It is equally evident from data for the subsequent years that for every state also the quantity went down over time (see Table 5). This is a question basically involved in the debate between an unchanging and a changing basket at the needed calorie level, and will be discussed later.

**Table 1. Expenditure on Food as Percentage of Total Expenditure at the Poverty Line in 1961-62, 1977-78, 1983 and 1987-88 in Rural India and the Range of this Percentage between 1961-62 and 1987-88**

(Calorie norm: 2,250)

State	Per cent of total expenditure on food					
	1961-62		1977-78	1983	1987-88	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Andhra Pradesh	77.0	(89.0-44.3)	72.7	65.9	57.3	(72.4-39.6)
2. Assam	77.1	(83.9-63.6)	77.4	75.0	69.6	(78.5-46.0)
3. Bihar	84.1	(84.1-33.7)	80.1	77.8	73.3	(78.2-42.7)
4. Gujarat	80.0	(81.5-60.5)	75.4	70.4	69.2	(74.7-56.5)
5. Haryana	N.A.		N.A.	70.0	70.5	(71.8-45.2)
6. Himachal Pradesh	N.A.		74.9	71.8	70.7	(75.4-43.7)
7. Jammu and Kashmir	83.3	(83.7-46.2)	79.2	77.6	73.0	(76.1-40.1)
8. Karnataka	76.9	(82.7-37.7)	71.9	69.6	68.9	(72.1-38.3)
9. Kerala	64.3	(79.7-40.5)	66.2	65.2	58.9	(72.6-43.8)
10. Madhya Pradesh	77.5	(82.3-48.8)	75.8	73.1	69.1	(74.8-42.2)
11. Maharashtra	70.6	(80.8-44.2)	69.9	63.7	62.1	(72.5-26.2)
12. Orissa	75.9	(79.7-54.6)	76.8	76.9	69.0	(78.5-42.3)
13. Punjab	80.6	(80.6-40.8)	72.8	67.2	65.8	(70.9-41.7)
14. Rajasthan	79.3	(84.4-50.6)	75.8	69.3	69.2	(71.2-51.4)
15. Tamil Nadu	78.0	(83.6-37.2)	70.8	66.5	61.9	(75.5-39.0)
16. Uttar Pradesh	80.0	(83.5-38.2)	75.2	70.1	67.9	(72.2-41.9)
17. West Bengal	81.0	(87.8-41.8)	77.4	72.9	74.1	(78.8-48.9)
18. India	79.7	(81.6-43.3)	75.0	70.9	67.1	(74.3-41.7)

\* Punjab in 1961-62 included Haryana and Himachal Pradesh. N.A. = Not available.

Since NSSO did not publish the an appropriate price index. Different quantity data on various items of food indices have been used by different consumed for every round of its con- scholars and agencies for the purpose. sumption expenditure survey, it was felt

necessary to estimate the incidence of poverty in successive years by adjusting the poverty line expenditure in-the base year (when it was calculated on the basis of needed calorie intake) with the help of

One price index used for the purpose was the Consumer Price Index for Agricultural Labourers (CPIAL) routinely compiled by the Labour Bureau for every state of the Indian Union. It was thought

that since a large part of the rural poor consisted of wage workers in agriculture, a consumer price index for this class of the rural population in a state would be appropriate to adjust the base year poverty line for general price level changes. Ahluwalia (1978) used this index to adjust the poverty line for various states and estimate the incidence of poverty from the per capita expenditure classes in the subsequent years of consumer expenditure survey.

The Planning Commission used other price indices for the purpose. First it used the wholesale price index, and subsequently the price index implicit in the current and constant price estimates of the total national private consumption expenditure in the National Accounts Statistics (NAS) of India published every year by the Central Statistical Organisation (Planning Commission, 1993, p. 14).

Minhas *et al.* (1987) and Minhas and Jain (1990) found all these indices unsatisfactory for the purpose. They Prepared consumer price indices specifically for adjusting the poverty lines for price change, for every state, by using the basket of commodities reported to have been consumed by the households in the middle ranges of per capita monthly expenditure in each state, near which the poverty line lay and which closely corresponded to the 40 and 60 fractile groups

of the rural population, for a base year 1960-61 (in fact 1961-62, which has been used as a substitute in view of lack of relevant data for 1960-61), and the prices for the respective baskets, from year to year, from the CPIAL.

It is needless to mention that the wholesale price index of India or even the implicit price index in the current and constant Price based series of the NAS of India simply cannot reflect the price index relevant for the expenditure class containing the rural poverty line for India, or for the individual states. As for the other two price indices, while the index prepared Minhas *et al.*, specifically for the purpose promises to be a relatively better index than the consumer price index for agricultural labourers, at the state level, it is Unlikely that they would adequately represent the poverty line in later years in different states. There are two possible reasons for this. The first is that the CPIAL may not properly represent the price index for the expenditure group containing the poverty line. Secondly, in case of the index prepared by Minhas *et al.*, specifically for the purpose, promises to be a relatively better index than the consumer price index for agricultural labourers, at the state level, it is unlikely that they would adequately represent the poverty line in later years in different states. There are two possible reasons for this: The first is that the

CPIAL may not properly represent the price index for the expenditure group containing the poverty line. Secondly, in case of the index prepared by Minhas *et al.*, the weights may not quite reflect the weights for the poverty line expenditure pattern. But both these are likely to be the changing composition of the basket of food as well as non-food items consumed by the population on or around the poverty line. The point can be illustrated by calculating the poverty line for two different years, for which the relevant NSS consumption data are available, on the basis of the specified calorie norm, and then comparing this poverty line in the second year with the poverty line for the second year calculated by applying

**Table 2. Poverty, Line for 1961-61 and 1971-72 Directly Calculated (Calorie Norm: 2,250) and 1971-72 Calculated by Inflating 1961-62 Line by Using the Consumer Price Index for Agricultural Labourers**

	Poverty line (Rs.)		
	1961-62	1971-72	Adjusted by CPIAL 1971-72
(1)	(2)	(4)	(6)
1. Rajasthan	120	341	211
2. Uttar Pradesh	146	316	280
3. Madhya Pradesh	147	292	306
4. Jammu and Kashmir	165	292	277
5. Punjab (including Haryana and Himachal Pradesh)	165	414	338
6. Gujarat	164	523	300
7. Karnataka	174	414	330
8. Bihar	169	414	350
9. Orissa	167	414	372
10. West Bengal	199	523	418
11. Assam	233	523	494
12. Tamil Nadu	235	468	439
13. Maharashtra	238	523	493
14. Andhra Pradesh	236	445	432
15. Kerala	464	690	979
16. All-India	170	414	340

**Table 3. The 1961-62 poverty Line for States Inflated by the State-Specific Price Index on Minhas et. al., for 1977-78 and 1983, and Compared with Poverty Line Directly Calculated**

(Calorie norm: 2,250)

State	Poverty line (Rs.)				Calorie level at poverty line in col. (5)
	1977-78		1983		
	Direct	Price adjusted	Direct	Price adjusted	
(1)	(2)	(3)	(4)	(5)	(6)
1. Andhra Pradesh	701	727	1300	1088	2127
2. Assam	714	752	1512	1262	2128
3. Bihar	614	598	1107	1011	2081
4. Gujarat	801	473	1487	785	1521
5. Haryana	680	1145	1371	1735	2500
6. Himachal Pradesh	648	1158	1200	1922	2900
7. Jammu and Kashmir	565	561	1085	875	2053
8. Karnataka	614	535	1248	883	1919
9. Kerala	936	1559	2080	2660	2500
10. Madhya Pradesh	582	520	1055	795	1956
11. Maharashtra	689	803	1398	1274	2230
12. Orissa	654	576	1229	1021	2000
13. Punjab	774	630	1498	964	1743
14. Rajasthan	543	412	1168	609	1800
15. Tamil Nadu	777	728	1762	1256	1900
16. Uttar Pradesh	555	500	1005	782	1900
17. West Bengal	658	668	1435	1091	2000
18. India	648	568	1267	918	1952

Source: The state-specific price indices with 1960-61 = 100 used for inflating the poverty lines calculated by Dandekar and Rath (1971) for 1960-61 are taken, from Minhas *et al.* (1990), Table 1 - col. 3, and Table 3- col. 5 and 6.



either of these price indices to the first year's poverty line. Table 2 and 3 present such calculations. Table 2 expresses the poverty line for each state, estimated for 1961-62 by Dandekar and Rath, by inflating it to 1971-72 by applying the state-specific CPIAL and simultaneously estimating the poverty line for 1971-72 on the basis of the NSS consumer survey data for that year. In Table 3 the poverty line, for every state, has been calculated for the years 1977-78 and 1983 directly from the consumer expenditure survey data of the NSS for the respective years, on the basis of calorie norm of 2,250 k.calories, and simultaneously applying the index prepared by Minhas *et al.*, to the 1977-78 poverty line to estimate the poverty line and the percentage of population below it in 1983. It is clear that the poverty lines calculated by applying either price index to a poverty line directly calculated earlier gives a significantly lower value than the total expenditure (new poverty line) at which the calorie norm was met in the later year.

Nevertheless, the Expert Group of the Planning Commission (1993, p. 18), the latest official body appointed to review the whole problem of measurement of poverty in India, recommends the preparation of a price index for the purpose, for rural India, by "taking the commodity group indices available from Consumer Price Index for Agricultural Labourer for

rural areas and the consumption pattern of the people around the poverty line at the National level for 1973-74 as weights". For individual states the Expert Group suggests this all-India weighting diagram to be used along with state-specific price indices from the respective state CPIALs. This may appear somewhat similar to the index prepared by Minhas *et al.*; but it is different in important respects: Minhas *et al.* use state-specific expenditure weights around state-specific poverty lines while the Expert Group opts for all-India weights; and Minhas *et al.*, use detailed itemwise price indices of the state-specific CPIAL while the Expert Group recommends (unavoidably, it appears) only two group indices - food and the rest.

The state-specific poverty lines calculated by them also appear similar the Expert Group appears to follow the approach of Minhas *et al.* published earlier, without saying so. Both start with the all-India poverty line calculated by the Task Force of the Planning Commission (1979) by applying the calorie norm of 2,435 k.calories per person (average of age-sex-activity) to the NSS consumption survey data for the Year, 1973-74. It is useful to mention here that this round of the NSS consumption survey was a Special *ad hoc* survey request by a government department for a different purpose; it had a relatively small

total sample, and, what is more significant, it had a reference period of not one year but only nine months, October 1973 to July 1974. For reasons best known to it, the Task Force chose to use this survey's consumption quantity and expenditure data instead of the consumption expenditure survey data of 1971-72 which was already available, with detailed calorie calculation, of course, after obtaining from the NSSO the estimated number of households and persons in every expenditure class. The later Expert Group of the Planning Commission (1993, p. 45) appears to have justified the poverty line based on this year's survey data to be used in all subsequent years, after adjusting by the price index, by saying, "Given that much systematic work has already been done with the base 1973-74, the Group is in favour of continuing it as the base year for estimating the poverty line." The 'Systematic work' that the Task Force (1978) had done had nothing to do with the 1973-74 consumer expenditure survey; it was concerned with devising the age-sex-activity based calorie norm for the average rural Indian (described earlier). The average calorie intake in the different per capita monthly (30 days) expenditure classes was not computed by taking the activity status of the population in the group, but taking only age and sex into accounts. Similar calorie intake Calculation have been made and published by the NSSO, for the

consumer expenditure surveys for 1971-72, 1977-78 and 1983, all these surveys covering full 12 months and the 1977-78, 1983 and the 1987-88 surveys involving large samples. It is, therefore, difficult to understand the support provided by the Expert Group (1993) to the all-India poverty line based on this small sample survey covering only nine months of 1973-74.

In any case, both the Expert-Group and Minhas *et al.* accept the all-India Poverty line calculated by the Task Force on the basis of the 1973-74 data, for calculation of state level poverty line for 1973-74. It is instructive to remember that even this 1973-74 survey data permitted calculation of separate state poverty lines applying the 2,400 k.calorie norm. But, while, possibly, Minhas *et al.* had no choice in the matter, the Task Force (1978) and its endorser (Expert Group, 1993) had no such difficulty. The choice of only the all-India poverty line, based on calorie norm, was deliberate, and it shall be discussed later. Minhas *et al.* noted that for a given basket of consumer goods, the value in different states in rural India was different. So, using the available indices for regional price Variation for the year 1961-62, they expressed the all-India poverty norm at state prices. It is such a state poverty line which was used to find out the weights of the different items in total expenditure in

and around the expenditure class containing the poverty line in 1961-62 for preparation of the price index over the years. No effort was made to find out if at such a state level poverty line the consumption of food in fact enabled the average person to obtain 2,435 calories, either because it was not considered possible, or because it was not considered necessary and relevant.

The Expert Group (1993) appears to have endorsed a broadly similar approach, though in the early stage of its recommendation it appears to suggest something different. On page 45 of its Report it is said: "State-specific poverty line should be estimated as follows. The standardised commodity basket corresponding to the poverty line at the national level should be valued at prices prevailing in each state in the base year, i.e., 1973-74." But two pages later, after describing how the consumer price indices to adjust poverty line in each state is to be calculated, the Group says: "The state-specific consumer price indices thus derived are adjusted for base year price differentials using Fisher's rural cost of living index reflecting price differential across states for 1960-61, as adopted by Minhas from Chatterjee and Bhattacharya. Given these adjusted state-specific consumer price indices for 1973-74, the state-specific poverty lines

for 1973-74 corresponding to the all-India poverty line are derived." The confusion about Fisher's rural cost of living index and between the temporal and spatial (regional) price indices notwithstanding, it is obvious that the Group has recommended the Minhas *et al.*'s approach.

Besides the unwillingness of the Planning Commission and its advisory bodies - the Task Force (1979) and the Expert Group (1993) - to estimate the poverty line for different states directly from the consumption expenditure surveys with the help of the specified calorie norm, and also to do this for the successive years in which such survey is conducted, the Planning Commission was adjusting the NSS consumer expenditure data every year with the help of the total private consumer expenditures obtained from the NAS of India for the same or comparable year. This resulted in an almost steady and sharp decline in the estimated proportion of the population as poor. The procedure was simple and sleek, and is best described in the words of the Expert Group:

"Such an adjustment has been felt (by the Planning Commission) to be necessary because the aggregate private household consumption expenditure as estimated from the NSS data is different from the aggregate price consumption

expenditure estimated in the National Accounts Statistics (NAS)" (Planning Commission, 1993, p. 14). "Usually the latter has been higher than the former, and the difference has been increasing over time. The difference in the two estimates is the result of several factors including differences in coverage, sources and quality of data and methods of estimation. The practice in the Planning Commission has been to raise the expenditure levels reported by the NSS across all expenditure classes by a factor equal to the ratio of the total private consumption as obtained from NAS and the total as estimated from NSS. The factor is applied uniformly to all expenditure classes. Poverty is then estimated from this adjusted distribution of population by expenditure classes. Since the NAS estimates of per capita private consumption are generally higher, this procedure gives a lower estimate of the incidence of poverty than the estimate derived without adjusting the NSS data" (Planning Commission, 1993, pp. 14-15). The Expert Group found this procedure, followed by the Planning Commission, of doubtful validity and recommended its discontinuance. The Group refers to the detailed exercise, carried out by Minhas *et al.*, at a disaggregate level, into the discrepancy between the two sets of data and points to the hazards involved in uniform pro rata adjustments. The Group further pointed out that the discrepancies

are likely to be relevant at higher expenditure classes, while for lower ones the discrepancy, if any, may be more in the reverse direction. Therefore, the Group recommended use of the unadjusted NSS consumer expenditure data for estimation of the incidence of poverty.

With this adjustment of the NSS data on distribution of population by consumer expenditure class, leading to a steadily lower estimation of the incidence of poverty, out of the way, the major question remains of the use of a single national poverty line pegged on the consumption pattern of a particular year for estimating the incidence of poverty in different regions from time to time. The Planning Commission's two advisory groups, the Task Force (1979) and the Expert Group (1993), appear convinced that this is the right thing to do. The Expert Group in its report states the alternative procedures open to it and the reason for the one it prefers. It is necessary to quote from the Expert Group Report (1993) at length to make the matter clear:

"3.17 The consumption basket of the poor also differs significantly across the states. It is inherent in the poverty line concept that non-food expenditures such as clothing, housing and fuel are not normatively estimated. The food habits will depend on local availabilities as well

as on cultural and consumer preferences reflected in differing choices between vegetarian and non-vegetarian food items, between fine and coarse food-grains, and in greater or smaller use of milk and milk products.

"3.18 Ideally the interstate differences in population structure, activity composition, climate and topographical price structure and their trends over time should be reflected in the state-specific poverty lines. On practical consideration, the Planning Commission had adopted the all-India calorie norms and used a common deflator for all the states for estimating the incidence of poverty. A number of states were of the view that given the current methodology, Planning Commission grossly under-estimated their poverty status. There is, therefore, a need to streamline the methodology in this respect. In this context it has been argued that there should be state-specific poverty lines reflecting the state-specific price differentials of the relevant consumption basket and that the national poverty line would be a weighted average of these 'state-specific' poverty lines to ensure consistency. It has been further argued that in estimating state-specific poverty lines, the state-specific consumption basket associated with the calorie norm should be used.

"3.19 It may, however, be noted that any meaningful comparison, whether longitudinal or latitudinal, of incidence of poverty would require the use of same consumption basket associated with the given calorie norm. If the state-specific consumption basket were used in the base year, it would no doubt provide a more meaningful comparison over time of the poverty situation in that state. If the concern is to ensure comparability across states as well as over time, we need to adopt the same consumption basket for all the states" (Planning Commission, 1993, pp. 19-20).

This long quotation first states the reason why the Planning Commission has been following the method, and then states the reason why the Group recommends that very method. While unequivocally stating that the 'ideal' method is to calculate state-specific poverty line on the basis of state consumption pattern, it is said that the Planning Commission adopted the alternative approach for 'practical considerations'. It is not possible to understand what these practical considerations were or could be. Whenever all-India level data from the NSSO were available for calculation of the poverty line, state level data were also simultaneously available. Scholars had already calculated and published the state level estimates for 1961-62 with 2,250 calorie

norm, and if the poverty line with 2,400 (2,435?) calorie norm was needed it could have been calculated expeditiously with the help of the published data. The NSSO had already tabulated and published the per consumer unit calorie intake for the different per capita expenditure classes for 1971-72 from which, with the available data on average size of the household, per person calorie intake figures for every expenditure class could be quickly calculated. The itemwise composition of consumption in various expenditure classes was readily available with the NSSO. As already mentioned, it is a mystery why the Planning Commission and its Task Force (1979) never even mentioned these tabulations (which needed to be supplemented only by the estimate of population in every expenditure class), but sought a special tabulation of the nine-month survey data of 1973-74. And, every subsequent round of the quinquennial consumer expenditure survey was reported in detail by the NSSO with all relevant calorie calculation at the state level. If, of course, the Planning Commission's 'practical consideration' meant something else, it is beyond the imagination of ordinary mortals.

Turning to the justification for the Planning Commission's approach provided by the Expert Group (1993), it is incomprehensible. It is difficult to

understand how meaningful comparison of poverty situation across space in India and over time ('latitudinal and longitudinal') is inhibited by regional (state-wise) direct estimation of poverty and facilitated by the use of a single all-India poverty line at a particular point in time. It is well known and well understood that in this vast country of India consumption habits of people in different regions, particularly in rural areas, have been largely governed by local production patterns and local climate, besides tastes governed by a variety of considerations including religious predilections. Jowar and bajra are dryland cereals and are largely unknown in wet paddy growing regions; tapioca (a cereal substitute with low calories), coconut and fish are plentiful in Kerala and enter into the diet of the poorest, while the first two are unknown in the Punjab. In Punjab, Haryana and Jammu and Kashmir even the lowest expenditure class consumed much more milk, on an average, than the equivalent expenditure classes in all other states in 1961-62. Woollen material features in the clothing of even the poorest in the temperate and sub-tropical regions of India while it is insignificant in all but the very high expenditure class in peninsular India. Class for class, a Gujarat villager consumed more edible oil than people in comparable classes in other parts of India. Potato in 1961-62 was more common in the diet of the rural

people in the Gangetic valley where it was grown more widely than in the peninsular region. Footwear of any type was not a common item of consumption in rural households in eastern India in the early sixties, but not so in northern or western India. In some parts, women needed nine yard length saree while in others four and a half yard length saree with breadth just adequate to cover upto the knee was the customary wear. The consideration of energy need apart, the calorie calculation of regional food baskets provided a meaningful common basis of comparison. But the Expert Group would have none of it; for, it thinks such endless variations in consumption of food, apparel, etc., frustrate all efforts at comparison of level of living. A wheat-gram-milk consuming Punjabi simply cannot be compared with a rice-tapioca-coconut-fish consuming Keralaite. The only way is a common basket for all; indeed, the Group appears to think the major merit of this all-India basket is, it is the basket of no group in particular in any region of India!

The pricing of the individual items in the all-India basket at regional prices is not always easy; items featuring in it are just not available in many regions. It is not surprising that having decided to price the basket at state level prices of the commodities in it, the Group opted finally for one of the available regional (spatial)

price indices for a particular year, accepting all solutions of such ticklish problems as per the best judgment of the devisers of that index.

That the all-India poverty line, adjusted by an available regional (spatial) price index for individual states, would give a much lower, or much higher poverty line for many states, compared to the poverty lines calculated for them on the basis of their individual consumption patterns in different expenditure groups, was not considered relevant by the Group. For example, applying the regional price index of 1961-62 to the all-India rural poverty line for that year calculated by Dandekar and Rath, gives poverty lines for states, (see Table 4), which for some states, like Rajasthan, Madhya Pradesh, Gujarat and Uttar Pradesh, were much higher and for other states, like Andhra Pradesh, Assam, Maharashtra and Tamil Nadu much lower, than warranted by their observed expenditure and consumption pattern in that year. The deviation was minimal only in the case of those states whose poverty lines happened to fall in the same per capita expenditure class as the all-India poverty line. It is understandable why the states may not feel satisfied with the approach of the Planning Commission and the Group. But that did not matter.

**Table 4. The State Poverty Lines for 1961-62 Computed by Dandekar and Rath, Compared with the State Poverty Line Calculated by Using the Regional Price Index to the Poverty Line for India as A Whole**

State	Poverty line in 1961-62 (Rs.)	
	Directly calculated by D-R	All-India poverty line adjusted by regional price index
(1)	(2)	(3)
1. Andhra Pradesh	236	171.5
2. Assam	233	188.4
3. Bihar	169	173.4
4. Gujarat	164	190.6
5. Haryana	165	178.0
6. Himachal Pradesh	165	178.0
7. Jammu and Kashmir	165	177.1
8. Karnataka	172	167.6
9. Kerala	464	181.2
10. Madhya Pradesh	147	159.5
11. Maharashtra	238	179.0
12. Orissa	167	166.4
13. Punjab	165	178.0
14. Rajasthan	120	175.6
15. Tamil Nadu	235	183.9
16. Uttar Pradesh	146	160.8
17. West Bengal	199	197.2
18. India	170	170.0

The Group appears to consider the regional price variations. The alternative estimation of the poor in India as a task approach estimates the poor in each state, in disaggregation than in aggregation. by a uniform criterion, and then adds Having estimated the total poor in India, these up to arrive at the all-India figure. It is difficult to see the logic of preferring the minimum necessary adjustments for the former to the latter.



The Planning Commission and its Expert Group (1993) also pitch for the poverty line basket in a particular year adjusted for changing value with the help of a price index over the years, instead of valuing the food baskets in terms of calories in every subsequent round of NSS consumer expenditure survey, for working out the poverty line in subsequent years. This too is stated to be in the interest of comparability over time. It is true that over the years the composition of the basket of consumables in every expenditure class, including the one containing the poverty line, has undergone change. Table 5 gives the quantity consumed per capita per month (30 days) of 12 food items in the two expenditure classes in 1961-62 and 1987-88, each containing the poverty line in that year, and the range (in parentheses) of average per capita consumption of each item over all expenditure classes in the respective years, for the major states of India. The data show that the cereal as well as pulse consumption per capita per month had gone down, in some states quite significantly, by 1987-88, except in the case of cereals in West Bengal and pulses in Tamil Nadu. As against this, the per capita consumption of milk and edible oil had consistently increased, in some states very significantly. The only other two items which show this trend are tea and coffee. Items like meat, fish and sugar and gur show varying tendencies - in some

states these increased and in others decreased. Similarly, expenditure on non-food items had come to form a higher proportion of total expenditure on the poverty line. The Expert Group notes some of these changes, but does not examine the reason for this, in the context of the calculation of the poverty line over the years.

The reasons for the changing basket are varied. The decline in cereal consumption per capita is across the board for all expenditure classes. The range of consumption, in quantities, brings this out clearly: in the lowest per capita expenditure group the per capita cereal consumption was lower in 1987-88 than in 1961-62. The reasons are: changing prices, availability and presumably the income situation. In the first place, the economics of crop production during the last three decades has led, in most states, to a decline in production of the so-called inferior cereals, like jowar, bajra, barley, and even ragi. In Andhra Pradesh, for example, the area under jowar and bajra has steadily declined over the years, yielding ground to competing non-food dry crops, resulting in a steady decline in production of these cereals. This, naturally, is reflected in the changing composition of the cereal consumption basket in rural Andhra Pradesh, and it will be misleading to term this as a preference by the consumers for the so-called superior



TABLE 5 (Contd.)

Food Items	Haryana	Himachal Pradesh	Punjab		Jammu and Kashmir		Karnataka	
	(146-160) 1987-88	(125-140) 1987-88	(13-15) 1961-62	(180-215) 1987-88	(13-15) 1961-62	(125-140) 1987-88	(13-15) 1961-62	(140-160) 1987-88
(1)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. Cereals and substitutes (kg)	13.66 (8.71-21.46)	14.92 (7.92-21.03)	15.95 (9.95-29.64)	12.07 (5.68-16.73)	16.84 (14.77-43.86)	16.69 (1032-24.96)	16.55 (11.22-68.38)	14.57 (8.95-20.44)
2. Pulses (kg)	0.58 (0.26-1.35)	0.97 (0.38-2.34)	0.77 (0.61-2.45)	0.86 (0.30-1.57)	0.83 (0.58-2.16)	0.56 (0.07-1.73)	1.30 (0.62-5.31)	0.95 (0.51-1.73)
3. Milk (kg)	9.70 (1.47-21.58)	4.86 (2.47-13.04)	1.74 (1.38-14.61)	11.28 (2.29-24.74)	2.72 (1.52-5.07)	8.03 (0.29-7.79)	1.38 (0.19-5.74)	3.09 (1.00-6.99)
4. Ghee, vanaspati and oil (kg)	0.20 (0.03-0.49)	0.33 (0.25-0.81)	0.18 (0.12-2.39)	0.42 (0.16-0.93)	0.33 (0.16-1.44)	0.34 (0.11-0.77)	0.21 (0.12-1.60)	0.27 (0.11-0.64)
5. Potato (kg)	0.75 (0.36-1.47)	0.75 (0.66-1.76)	0.28 (0.16-1.47)	0.93 (0.32-1.42)	0.31 (0.00-0.73)	0.61 (0.58-1.91)	0.02 (0.01-0.41)	0.19 (0.04-0.49)
6. Meat (kg)	0.06 (0.01-0.35)	0.08 (0.00-0.34)	0.03 (0.03-0.32)	0.02 (0.00-0.10)	0.07 (0.02-3.40)	0.14 (0.00-0.50)	0.14 (0.05-0.27)	0.13 (0.03-0.32)
7. Fish (kg)	- (0.00-0.03)	0.02 (0.00-0.03)	- (0.00-0.09)	- (0.00-1.01)	0.01 (0.00-0.35)	0.03 (0.00-0.03)	0.03 (0.00-0.35)	0.11 (0.00-0.15)
8. Eggs (No.)	0.05 (0.00-0.50)	0.08 (0.00-1.63)	- (0.00-0.92)	0.39 (0.00-2.44)	0.34 (0.00-1.89)	0.87 (0.66-2.64)	0.22 (0.00-3.08)	0.32 (0.02-2.28)
9. Sugar (including crystal) (kg)	0.79 (0.26-2.62)	0.88 (0.45-1.67)	1.61 (0.00-16.84)	1.57 (0.48-3.17)	0.42 (0.00-2.51)	0.42 (0.14-1.55)	0.54 (0.26-6.49)	0.54 (0.10-1.25)
10. Gur (kg)	0.78 (0.45-1.21)	0.13 (0.07-0.30)	0.96 (0.00-5.75)	0.76 (0.25-1.39)	0.19 (0.00-0.40)	0.03 (0.00-0.04)	0.37 (0.15-3.45)	0.50 (0.19-0.80)
11. Tea (leaf) (gms)	79.51 (40.07-138.38)	37.51 (13.26-95.73)	31.75 (18.14-185.97)	124.07 (36.18-197.85)	54.43 (36.29-358.34)-	93.88 (50.19-766.6)	9.07 (4.54-390.09)	52.37 (1235-97.74)
12. Coffee (powder) (gms)	- (0.00-0.00)	- (0.00-0.00)	- (0.00-0.00)	- (0.00-0.00)	- (0.00-0.00)	- (0.00-0.00)	- (0.00-172.37)	32.74 (2.69-66.18)

\* Punjab, in 1961-62 included Haryana and Himachal Pradesh.

(Contd.)

TABLE 5 (Contd.)

Food Items	Kerala		Madhya Pradesh		Maharashtra		Orissa		Rajasthan	
	(34-43) 1961-62	(280-385) 1987-88	(11-13) 1961-62	(125-140) 1987-88	(18-21) 1961-62	(180-215) 1987-88	(13-15) 1961-62	(140-160) 1987-88	(8-11) 1961-62	(125-140) 1987-88
(1)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
1. Cereals and substitutes (kg)	26.74 (7.94-26.74)	15.12 (6.42-16.42)	18.41 (12.28-56.9)	15.71 (10.69-22.95)	15.27 (10.98-48.46)	14.65 (9.92-18.47)	17.63 (11.3-100.98)	18.06 (10.26-24.46)	19.35 (16.15-48.05)	15.85 (11.11-27.27)
2. Pulses (kg)	1.28 (0.03-1.78)	0.72 (0.09-1.12)	1.40 (0.66-853)	1.16 (0.55-2.81)	1.34 (0.58-3.38)	1.31 (0.54-2.16)	0.96 (0.33-6.03)	0.63 (0.11-1.83)	0.81 (0.54-6.38)	0.50 (0.12-2.17)
3. Milk (kg)	1.53 (0.15-4.69)	4.02 (0.16-7.52)	0.71 (0.10-6.42)	2.19 (0.37-8.32)	1.74 (0.13-3.04)	3.27 (0.43-6.94)	0.11 (0.01-5.18)	0.63 (0.10-4.49)	0.39 (0.39-7.87)	5.23 (0.68-18.70)
4. Ghee, vanaspati and oil (kg)	0.35 (0.05-1.48)	0.40 (0.08-0.62)	0.16 (0.07-5.96)	0.25 (0.08-1.22)	0.27 (0.07-0.86)	0.51 (0.16-1.21)	0.10 (0.02-0.62)	0.22 (0.05-0.77)	0.12 (0.08-6.70)	0.23 (0.06-1.32)
5. Potato (kg)	0.32 (0.00-0.31)	0.30 (0.03-0.39)	0.25 (0.05-4.66)	0.83 (0.43-1.83)	0.16 (0.10-0.63)	0.47 (0.16-0.86)	0.36 (0.04-2.09)	1.37 (0.29-5.46)	0.02 (0.02-4.00)	0.41 (0.19-1.37)
6. Meat (kg)	0.26 (0.04-0.74)	0.29 (0.05-0.64)	0.02 (0.01-0.70)	0.03 (0.01-0.15)	0.10 (0.01-0.50)	0.20 (0.05-0.45)	0.04 (0.01-0.80)	0.04 (0.00-0.49)	0.01 (0.01-0.66)	0.05 (0.01-0.20)
7. Fish (kg)	1.32 (0.42-2.37)	1.27 (0.43-1.81)	0.03 (0.00-0.20)	0.05 (0.01-0.05)	0.10 (0.01-0.17)	0.09 (0.01-0.21)	0.31 (0.04-3.82)	0.26 (0.04-0.54)	- (0.00-0.04)	0.00 (0.00-0.00)
8. Eggs (No.)	1.28 (0.00-3.09)	4.23 (0.10-6.87)	- (0.00-1.64)	0.14 (0.01-0.61)	0.36 (0.03-1.07)	0.83 (0.07-2.88)	0.10 (0.01-5.00)	0.11 (0.04-1.45)	- (0.00-1.62)	0.02 (0.00-0.45)
9. Sugar (including crystal) (kg)	1.24 (0.13-1.70)	0.95 (0.34-1.30)	0.39 (0.11-16.62)	0.51 (0.11-2.45)	1.34 (0.17-3.15)	1.18 (0.35-2.39)	0.34 (0.02-2.02)	0.38 (0.05-1.43)	0.39 (0.15-24.15)	0.72 (0.18-3.89)
10. <i>Gurr</i> (kg)	0.28 (0.05-0.59)	0.12 (0.04-0.24)	0.30 (0.08-3.40)	0.34 (0.16-0.86)	0.58 (0.16-1.05)	0.24 (0.15-0.35)	0.24 (0.01-1.30)	0.12 (0.02-0.27)	0.29 (0.11-4.19)	0.36 (0.10-1.92)
11. Tea (leaf) (gms)	45.36 (4.54-77.11)	89.32 (2657-116.25)	4.54 (0.00-54.43)	29.83 (7.09-103.99)	40.82 (4.54-108.86)	76.12 (26.31-126.64)	- (0.00-77.11)	19.12 (5.40-65.93)	- (0.00-154.22)	49.06 (11.08-147.11)
12. Coffee (powder) (gms)	40.82 (9.07-99.79)	39.14 (7.46-66.09)	- (0.00-0.22)	- (0.00-0.22)	- (0.00-0.24)	- (0.00-0.24)	- (0.00-0.24)	- (0.00-0.24)	- (0.00-0.24)	- (0.00-0.24)

(Contd.)

TABLE 5 (Concl'd.)

Food Items	Tamil Nadu		Uttar Pradesh		West Bengal		All-India	
	(18-21) 1961-62	(215-280) 1987-88	(11-13) 1961-62	(110-125) 1987-88	(15-18) 1961-62	(140-160) 1987-88	(13-15) 1961-62	(160-180) 1987-88
(1)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
1. Cereals and substitutes (kg)	17.14 (6.85-30.87)	14.57 (8.34-17.37)	15.57 (10.05-38.99)	15.01 (11.13-24.36)	15.06 (8.07-43.17)	15.95 (7.44-23.38)	15.82 (11.14-40.31)	15.62 (9.86-20.94)
2. Pulses (kg)	0.93 (0.15-2.30)	1.14 (0.24-1.71)	1.77 (0.92-6.74)	0.97 (0.61-2.21)	0.91 (0.25-2.08)	0.48 (0.21-1.46)	1.24 (0.49-4.38)	0.91 (0.39-1.86)
3. Milk (kg)	0.47 (0.06-3.47)	3.46 (0.11-7.94)	0.59 (0.27-5.79)	3.02 (0.39-13.94)	0.77 (0.15-6.59)	1.56 (0.08-5.13)	0.79 (0.10-6.32)	3.94 (0.33-11.57)
4. Ghee, vanaspati and oil (kg)	0.28 (0.08-1.03)	0.37 (0.08-0.54)	0.16 (0.08-1.60)	0.27 (0.13-0.96)	0.26 (0.10-1.40)	0.33 (0.12-1.10)	0.22 (0.03-2.04)	0.35 (0.10-0.97)
5. Potato (kg)	0.09 (0.02-0.67)	0.41 (0.06-0.47)	1.34 (0.31-1.68)	2.10 (1.30-3.87)	0.70 (0.11-3.69)	2.27 (0.89-5.78)	0.49 (0.10-1.67)	1.34 (0.53-1.80)
6. Meat (kg)	0.28 (0.05-0.70)	0.24 (0.05-0.37)	0.05 (0.02-0.99)	0.90 (0.02-0.68)	0.04 (0.01-0.39)	0.12 (0.02-0.72)	0.07 (0.03-0.48)	0.12 (0.03-0.41)
7. Fish (kg)	0.21 (0.06-0.77)	0.20 (0.00-0.20)	0.05 (0.05-0.23)	0.05 (0.03-0.12)	0.29 (0.15-1.41)	0.45 (0.16-2.02)	0.16 (0.10-0.50)	0.20 (0.04-0.36)
8. Eggs (No.)	0.27 (0.00-2.44)	1.42 (0.02-4.66)	0.06 (0.04-0.58)	0.07 (0.01-0.76)	0.47 (0.00-2.60)	1.15 (0.38-4.00)	0.11 (0.04-1.30)	0.59 (0.05-2.45)
9. Sugar (including crystal) (kg)	0.50 (0.04-2.09)	0.63 (0.03-1.12)	0.73 (0.36-4.83)	0.26 (0.06-1.70)	0.35 (0.03-4.39)	0.37 (0.10-1.51)	0.51 (0.10-5.37)	0.60 (0.10-1.95)
10. Gur (kg)	0.02 (0.02-0.78)	0.28 (0.04-0.35)	0.59 (0.27-2.51)	0.62 (0.34-1.15)	0.19 (0.02-2.07)	0.10 (0.05-0.49)	0.38 (0.10-2.08)	0.39 (0.13-0.70)
11. Tea (leaf) (gms)	13.61 (0.00-18.14)	20.32 (1.00-52.07)	4.54 (0.00-22.68)	12.10 (1.24-77.93)	9.07 (0.00-127.00)	27.50 (4.42-79.50)	9.07 (0.00-95.25)	43.65 (7.07-137.37)
12. Coffee (powder) (gms)	22.68 (0.00-131.54)	51.13 (2.44-96.07)	-	-	-	-	4.54 (0.00-31.75)	4.93 (0.90-19.31)

cereals. The decline in per capita pulse consumption is easily explained in terms of steadily rising relative price of pulses. Even then, more than 80 to 100 per cent of the sample households in every state consumed some pulse, however little, since this is a necessary ingredient in an ordinary Indian diet. The increase in the per capita consumption of milk is largely due to increased local production and availability and simultaneously the greater consumption of tea in the countryside. More than 80 to 100 per cent of the sample rural households in the states of Karnataka, Maharashtra, Gujarat, Rajasthan, Punjab, Haryana, Himachal Pradesh and Jammu and Kashmir reported consumption of some milk in 1987-88. In these states there has firstly been a visible growth in milk production in the villages. Many small farmers and some agricultural labour households have a milch animal each. While they sell the bulk of milk, a little quantity is retained for tea and for an infant if one is there. In many of these states, the 20 or 25 per cent of the rural households, who are poor, keep a goat or two each - this being the cheapest milch animal to maintain since the goat depends on free grazing. Besides the sale of the kid, the household gets about half a litre of milk per day of lactation for about 5 to 6 months in the year. The milk is adequate for tea as well as an occasional infant in

the household. In fact, spread of consumption of tea and milk appears to go together. In state after state as large a proportion of rural households reported some consumption of milk and purchase of tea (and coffee) powder. With opening up of the countryside, the habit of drinking tea has of course spread. But, it may be noted that field workers in villages in many rural areas who in earlier years used to go to work in the morning after eating a gruel or bread made of some cereal, today go after drinking a potful of tea - they consider it an effective killer of appetite besides being a light stimulant.

The increase in the consumption of oil is not as significant as in the case of milk. This has come about due to greater production of oilseeds and oils over the years, as well as sale of imported palm oil at subsidised rates through fair price shops by the Government. Consumption of fish and meat appears to have declined somewhat in traditionally non-vegetarian regions, while in some others meat consumption had recorded a marginal rise. Similar is the story about sugar and *gur*.

Separate quantity data on consumption of cloth, footwear, etc., and durable consumer goods are not available for 1987-88. But, it is likely that per capita consumption of attire increased, thanks to opening up of the countryside and changes in the availability of different

types of textiles. Village men and women, and even children possibly do not feel as much at ease with the scanty attire of earlier years since they are now more open to the gaze of outsiders to the village, etc. The decline of potters and the recourse to more durable and, in the long run, less expensive plastic and aluminium containers might have increased the expenses on durable consumer goods, besides cups for tea.

This elaborate description of the circumstances leading to the changing pattern of rural consumption, particularly at the lower per capita expenditure levels, is meant to suggest that most of these changes are unavoidable. To ignore such changes in calculating the poverty line on the specious ground that these are changes in 'tastes' which cannot be the basis of poverty calculations, is to refuse to recognise the inevitable and unavoidable, and insist on a basket of yester years that even the poorest today cannot easily obtain. The only effective result of this approach is to demonstrate a steadily declining incidence of poverty, whatever be the ground realities.

'Poverty', it has been widely recognised, is a relative concept. It cannot mean the same for every country and for any country at every phase in its history. If the calorie norm has been used in India during the last three decades, it is because

it was felt that it was a convenient objective norm, in the prevailing socio-economic situation of the country, with which to define an income (or total expenditure) below which the Indian may be considered poor. It is not necessary or desirable to fix the basket for this purpose for all time, but to take any natural changes into account, while holding to the objective norm. A situation may emerge where the norm has to be revised, one way or the other. But till then, refusing to recognise socio-economic variations and realities will not help.

The best available method, therefore, is to calculate the poverty line for every state for each round of the NSSO's consumption expenditure survey applying the estimated calorie norm. If separate calorie norms, rural and urban, are required for individual states, these can be estimated using the same sources for age, sex and activity data about the state population as was used by the Task Force for India as a whole. It is not known why the Task Force (1979) did not attempt this, or the Planning Commission subsequently for that matter. Indeed, the NSS can give the age-sex-activity status of the population in each expenditure class to obtain separate calorie norms expenditure classwise, if necessary.

The proper procedure to fix the poverty line and estimate the incidence of poverty would be to apply the calorie norms for the average Indian, rural and urban separately (till state-specific, and even expenditure class specific norms are available) to the consumer expenditure survey data by the NSSO in every round of this survey, at the state level, and aggregate the estimated population below the poverty line for all the states to arrive at the incidence of poverty in India as a whole. It may be objected that since the NSSO has been conducting consumer expenditure surveys once every five years (the recently resumed annual surveys have small samples) one cannot get estimates of incidence of poverty on an annual basis by following this method. It is not clear why annual estimates of the incidence of poverty are necessary. For any and all policy propositions, a quinquennial estimate should be more than enough.

#### IV DIMENSIONS OF RURAL POVERTY

What has been the trend in the incidence of poverty in rural India during the last three decades? Table 6 presents the poverty line and the proportion of rural population below this line in every state of India in the four years for which the relevant data are readily available for calculation of the poverty line: 1961-62,

1971-72, 1977-78 and 1983 (the incidence of poverty in 1971-72 cannot be calculated for reason mentioned earlier). Since the detailed calorie calculations are not available for the year 1987-88, a rough approximate calculation has been attempted by us for this year, merely to get an idea of the trend in the incidence of poverty in various states and India as a whole over the three decades. The calculations are made with two alternative calorie norms - 2,250 k.calories used by Dandekar and Rath for 1961-62, and 2,400 k.calories for rural India suggested by the Task force (1979) of the Planning Commission. While the 2,250 calorie norm based calculations are presented for all the five years, the 2,400 calorie based norm has been used for only the three middle years; for the two end years the calculations will take a lot of time.

The data show that the percentage, of poor people in rural India (measured by the norm of the total expenditure enabling an average household to obtain 2,250 calories from food) had increased from about 38 per cent in 1961-62 to 48 per cent by 1977-78. By 1983 it had risen to about 58 per cent and it appears it had gone up to almost 64 per cent by 1987-88. By the 2,400 calorie norm, the percentages are distinctly higher.



This increasing trend is there for all states, but there are regional variations in it. In the state of Rajasthan, while the percentage increased from 13 in 1961-62 to about 20 in 1977-78, rose to 46 per cent in 1983 and appears to have registered a decline to about 40 in 1987-88. The other state showing a similar trend in the inci-

dence of poverty over the three decades is West Bengal: 44 per cent of its rural population was poor in 1961-62; it rose to 56 per cent in 1977-78, rose further about 71 per cent in 1983 and appears to have declined to around 68 per cent by 1987-88.

**Table 6. Poverty Line and Percentage of Rural Population Below it in Different States of India**

**(A) Rural Poverty Line At Current Prices/Rs.**

(Calorie Norm: 2,250)

State (1)	1961-62 (2)	1971-72 (3)	1977-78 (4)	1983 (5)	1987-88* (6)
1. Andhra Pradesh	236	430	701	1,300	2,616
2. Assam	233	498	714	1,512	2,366
3. Bihar	169	383	614	1,107	1,638
4. Gujarat	164	503	800	1,487	2,270
5. Haryana	-	394	680	1,371	1,807
6. Himachal Pradesh	-	374	648	1,200	1,633
7. Jammu and Kashmir	165	301	565	1,085	1,599
8. Karnataka	172	411	614	1,248	1,923
9. Kerala	464	703	936	2,080	3,635
10. Madhya Pradesh	147	264	582	1,055	1,640
11. Maharashtra	238	518	689	1,398	2,262
12. Orissa	167	411	654	1,229	1,713
13. Punjab	-	461	774	1,448	2,220
13(a). Punjab, including Haryana and Himachal Pradesh	165	393	-	-	-
14. Rajasthan	120	329	543	1,168	1,610
15. Tamil Nadu	235	468	777	1,762	3,030
16. Uttar Pradesh	146	320	555	1,005	1,476
17. West Bengal	199	515	658	1,435	1,918
18. India	170	398	648	1,267	1,973

(Contd.)

**(B) Percentage of Rural Population Below Poverty Line**

(Calorie Norm: 2,250)

State (1)	1961-62 (2)	1977-78 (3)	1983 (4)	1987-88* (5)
1. Andhra Pradesh	62.1	48.6	57.9	79
2. Assam	47.7	56.0	72.2	80
3. Bihar	37.9	49.5	55.8	65
4. Gujarat	19.1	57.1	63.3	74
5. Haryana	-	23.5	37.1	32
6. Himachal Pradesh	-	24.2	24.4	24
7. Jammu and Kashmir	13.7	15.8	21.8	29
8. Karnataka	26.9	46.2	52.0	69
9. Kerala	90.8	64.0	76.2	84
10. Madhya Pradesh	25.8	50.8	52.8	61
11. Maharashtra	61.0	61.8	66.0	79
12. Orissa	43.9	61.3	63.2	70
13. Punjab	-	20.6	33.1	41
13(a). Punjab, including Haryana and Himachal Pradesh	14.0	-	-	-
14. Rajasthan	55.2	66.7	79.9	85
15. Tamil Nadu	18.1	33.0	44.8	47
16. Uttar Pradesh	44.1	56.0	70.7	68
17. West Bengal	38.0	-	-	64
18. India	30.9	47.7	57.6	67

\* This is an approximate figure based on calorie calculation relative to the major food items published by the NSS and therefore subject to revision.

**TABLE 6. (Concl'd.)**  
**(C) Rural Poverty Line and Incidence of Poverty**

(Calorie Norm: 2,400)

State (1)	Poverty line (Rs.)			Incidence of poverty	
	1971-72 (2)	1977-78 (3)	1983 (4)	1977-78 (5)	1983 (6)
1. Andhra Pradesh	464	790	1,549	58.5	71.2
2. Assam	558	790	2,073	68.0	90.9
3. Bihar	418	674	1,234	57.4	67.6
4. Gujarat	520	893	1,449	65.7	71.5
5. Haryana	416	798	1,542	35.3	47.6
6. Himachal Pradesh	602	762	1,348	38.7	34.6
7. Jammu and Kashmir	344	628	1,232	24.2	35.6
8. Karnataka	445	651	1,408	50.3	61.5
9. Kerala	803	982	2,339	66.8	82.1
10. Madhya Pradesh	286	665	1,210	60.3	64.4
11. Maharashtra	614	821	1,692	74.4	78.2
12. Orissa	468	681	1,352	68.3	69.8
13. Punjab	507	866	1,561	28.1	39.3
14. Rajasthan	359	608	1,377	26.5	57.6
15. Tamil Nadu	523	871	2,098	74.7	85.7
16. Uttar Pradesh	355	625	1,133	43.1	54.7
17. West Bengal	580	726	1,613	64.4	77.8
18. India	440	735	1,460	58.2	68.5

The states of Jammu and Kashmir, Himachal Pradesh, Haryana and also Punjab are states which have a relatively low incidence of poverty all along, though there has been a perceptible rise in it in the seventies and eighties compared to the beginning of the sixties.

There are, on the other hand, states in which the incidence sharply increased in the seventies and has continued to rise thereafter, either slowly or rather fast. Such states are Karnataka, Tamil Nadu, Gujarat, followed by Madhya Pradesh, Orissa, Bihar and Uttar Pradesh. Maharashtra has shown high incidence of rural poverty all along which appears to have gone up rather sharply in 1987-88. Kerala too has shown a continuous rise in the seventies and eighties, even if the estimate for 1961-62 is ignored due to doubtful data base. All these calculations are on the basis of the norm of 2,250 k.calories per person. On the norm of 2,400 k.calories, suggested by the Task Force (1979), the level of incidence is higher all along.

Two points stand out clearly. Firstly, contrary to what the Indian Planning Commission had been suggesting during the last decade, the incidence of rural poverty in the country as a whole and in almost all states had increased over the three decades since 1961-62. While in the four northern most states the increase has

been rather moderate or little, in the remaining states it has been significant. While the five northern states of Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana and Rajasthan accounted for only 6.79 per cent of the estimated number of the total poor in India in 1987-88 (on 2,250 calorie norm), the central zone consisting of Gujarat, Madhya Pradesh and Uttar Pradesh accounted for 26.21 per cent, the eastern zone consisting of Assam, West Bengal, Bihar and Orissa accounted for 28.76 per cent and the southern zone consisting of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh and Maharashtra accounted for 38.22 per cent; the proportion of the estimated rural population in these four zones was 11.75, 30.61, 26.85 and 30.75 per cent respectively. The southern and eastern zones between them accounted for two-thirds of the rural poor in India.

The second point of significance is that in seven of the states the incidence in 1987-88 was 70 per cent or more: Tamil Nadu (85), Kerala (84), Andhra Pradesh (79), Maharashtra (79), Gujarat (74), Assam (80) and Karnataka (69). Such high incidence of rural poverty in some of these large populous states is sure to create skepticism about the data base of the estimation. This may appear strengthened when one finds that at the poverty line per capita expenditures in these states the consumer is consuming

much less cereals and much more milk, and to a lesser extent more edible oil than in 1961-62. This is possibly what led the Expert Group (1993) to suggest price indexing a basket of an earlier period, rather than taking into account the new basket in every new year of survey.

In order to see what the application of a price index to the relevant basket at the poverty line in an earlier year would indicate in terms of calorie consumption at the level of expenditure equal to the price adjusted poverty line, an illustrative calculation is attempted in Table 3. It shows the poverty line calculated by Dandekar and Rath for every state in 1961-62 (2,250 k.calories) updated to 1983 for price changes with the help of the price index of the middle level rural per capita expenditure class in every state by Minhas *et al.* It is necessary to remember that in preparing this price index they used the state-specific baskets at the middle expenditure levels covering between 40 and 60 per cent of rural households in each state. Table 3 also shows the calories that an average person at this adjusted poverty level per capita expenditure was obtaining from the food he was reportedly consuming. It is clear that in every state this gave lower calories than 2,250 per capita - in most states much less than 2,000 k.calories per person per day.

What is the significance of this? It suggests that people - not only those on the poverty line, but also those below it - appear to prefer more expensive calories to cheaper ones even if they get 'inadequate' calories on an average in the process. Despite what has been said earlier about the inevitability of the changing composition of the consumption basket at the lower expenditure levels, the discomfort may persist, because this behaviour may not be quite in keeping with commonsense.

There are only two ways of resolving these doubts and skepticisms. One, to question the correctness of the NSSO's consumer expenditure data, to find out if these data are not becoming less and less reliable over time. While such assessment is always necessary, in the context of poverty estimation it is becoming more relevant.

The other is to question the calorie norm used to identify the poverty line. The particular calorie norm used is based on the nutritionists' specification about the normal requirements of Indians of different sex, age and activity type. The average for the population is calculated by applying these age, sex, activity specific norms to the distribution of the population according to age, sex and activity type. It is possible that over the years the activity status of a growing

proportion of the rural population is becoming such that it does not require as large an input of calories as was the case earlier. There are two possible reasons for or sources of this decline:

In the first place, conditions of living and working in almost all parts of rural India have undergone a change of a type that demands less physical effort than thirty years ago. In the beginning of the sixties - not to speak of earlier times - the female folk not only in the villages of Rajasthan but of many other parts of rural India had to tread long distances to fetch water for daily household needs. This undoubtedly is much less so today. Availability of easily accessible sources of water has steadily increased over the years in the countryside, making this routine task so much less strenuous and demanding of effort and energy. In those days, for most villagers there was only one way of travelling from one village to the other or to a taluka town, in order to visit relations or friends or hospitals or government offices - by walking. Over the years, approach roads and passenger bus service have steadily increased. The need to walk for the purpose has steadily declined. Shops and markets for not only daily needs but also many occasional needs have moved nearer the villages. Use of mechanised equipments, like tractors, threshers, diesel or electric pumpsets for irrigation, have reduced the

effort required of human labour for such tasks. Use of bio-gas plants for fuel for cooking has spared the householder the labour involved in collecting and cutting firewood. These improvements have, of course, not been uniform across the whole of rural India. But wherever such changes have taken place, they have reduced the effort required of the villagers, and therefore the need for correspondingly larger intake of calories. This has to be taken into account in estimating the calorie needs of the rural population in different parts of the country.

The second reason is of a different type. If the opportunity for work - either self-employment or wage employment - does not increase in the same proportion as the population of working age, the inevitable consequence will be work sharing, with not merely the effective working hours becoming less and less, but also the nature of work as well as the output of effort per hour of work becoming smaller, thereby accommodating a larger body of workers for reasonable periods of time. Could it be that such Leibensteinian phenomenon has been under way in many parts of rural India? If true, it would need redefining the calorie norms downwards in keeping with the reduced energy needs for many types of activity. This would, naturally, reduce the incidence of poverty, by lowering the poverty line in keeping with

the reduced calorie norm. Would this be another manifestation of 'the small is beautiful' ? The implication of it, of course, will be highly disturbing: a declining or unchanging incidence of poverty, under such condition, will hide the really serious economic malaise the nation would be undergoing.

### V RISING INCIDENCE OF RURAL POVERTY AND POLICY MEASURES TO COMBAT POVERTY

Whatever the results of such investigations, it is necessary to briefly examine why the incidence of rural poverty in India could be rising. Since agriculture is the mainstay of the bulk of rural Indians, highly fluctuating agricultural production over the years, due to fluctuation in rainfall, may lead to the incidence of poverty greatly fluctuating from one year to another, as seen in the case of Rajasthan. Similarly, a rapid rise in agricultural production due to growth in irrigated cropped area and use of high-yielding variety seeds may increase incomes not only of the farmers but also the wage earnings of labourers.

It is, however, doubtful if these developments, along with expansion of non-farm employment in the countryside, can fully counteract two other factors that are working without respite to worsen the situation. The growth rate of

population living in rural areas had varied over the years between 1.9 and 2.2 per cent a year. This has resulted in two developments in India's rural economy: One is the decline in the amount of cultivated land available per household, and the consequent increase in the proportion and numbers of the landless and the marginal farmers. The second is the inability of the work opportunities, both farm and non-farm, to grow in keeping with the growth in the number of working age population. Both these can result in growing proportion of the poor in rural India.

The NSSO's cultivated land holding surveys over the years show that the percentage of rural households that were either landless or had less than one acre of land (a part of which was the house site) to cultivate on their own, was 42 in 1961-62; by 1982 it had increased to 50 and by 1987-88 it was 54.4. These households depend entirely on casual wage earnings in agriculture and non-agricultural work. Some of the 17 per cent of the rural households with 1 to 2.5 acres of land each are also mainly in the category of the poor since the income from such lands is often a pittance. In 1977-78, more than half the estimated number of poor households had either no land or less than a quarter of an acre per head. Another 30 per cent had between 0.25 to 0.75 acres per head. A large part of these

households is likely to come from the arid and semi-arid regions of India where productivity of land under unirrigated conditions is very low (and most of the land is unirrigated).

The NSS data on employment does not show very large proportion of time of the rural population spent on unemployment, though the percentage of time spent on unemployment is somewhat higher amongst the poor than the rest. The main reason for this is the spread of work, through work sharing, reduced hours and less efficient work output per hour.<sup>4</sup> It is striking that in the poor households in 1978-79 with so little land per person to cultivate, the male members of the household spent more than 46 per cent of their work days on their farm, and less than a third of their time in casual labour in farm and non-farm work. Statewise examination of this type of data is likely to highlight the situation better.

In the absence of a falling rate of growth of population, and a rapid withdrawal of labour from agriculture to other productive activities, the problem of poverty in many parts of rural India has acquired serious proportions, the finer debates on its measurement notwithstanding.

Unfortunately, much less serious attention, by academics and planners, has been paid to formulating and assessing measures to improve the situation, than to measuring poverty. The Planning Commission and the Government of India formulated a two-fold programme in the late 1970s to attack the problem of rural poverty. One was to help the poor with assets for self-employment generation and the other was starting public works in which the wage component will be the major cost, to assure the under-employed and the poor men and women employment at a minimum subsistence wage in order to rise above poverty. The first has been the mainstay of this anti-poverty programme, in which the state has gone about identifying poor households in the countryside to help them with small capital resources for dairy, local transport, small trade, and such other self-employment generating activities for which the banks have been directed to loan out 70 to 75 per cent of the needed capital, the state bearing the remaining 25 to 30 per cent as subsidy. This programme, called the Integrated Rural Development Programme (IRDP), is now in the field for the last 16 years. Independent surveys conducted by the Government and others show that not even 15 per cent of the beneficiaries have been able to rise above poverty, though a larger population has received some increased income (Rath, 1985).

The employment programme, on the other hand, has been treated as a supplementary programme, for which the financial resources had to come only from the state exchequer. That possibly is one reason for its secondary role. Only one state, Maharashtra, tried a rural Employment Guarantee Scheme, in which all who sought piece rate work at a daily subsistence wage rate were assured work. But this scheme has also run into difficulties in recent years, because of the judicial decision that the workers in such public works have to be paid the minimum wages stipulated for agriculture by the state.

But, for regions in which poverty is serious, public work can mean many more things than what Maharashtra has tried. The first and most important task would be to extend irrigation in farming areas that would have the most significant impact on productive employment. In most states where today the incidence of poverty is high, irrigation is on the low side, with significant potentiality for its extension. But the state in India, which till today is the sole provider of investment funds for flow irrigation, has steadily reduced real investment in irrigation during the 1980s (Rath, 1989). This public work, with a policy promoting more economical use of water such that the rural economy generates the highest possible net income per unit of

irrigation water, can do much more to improve the poverty situation in these states, than any other type of public works in the long run.

Agricultural development as well as better conditions of rural living requires better roads and communication. But in many of the states with high incidence of poverty, nearly a quarter to thirty per cent of the villages do not have all weather roads linking the villages to the nearest highway. The absence of safe, adequate source of water for drinking and other household use still plagues a significant proportion of villages. The situation is not very different in the matter of primary schools and primary health centres. These are public works which hold the potential of large scale employment of unskilled and semi-skilled labour to start with, and then of growingly larger numbers of primary teachers and health workers. Some of these tasks by the state are such that, in the light of the present or even the projected growth rate of population, their proper provision will require a considerable part of the budgets of the State Governments for the next quarter of a century.

In the tribal areas where land for agriculture is scarce, there is extensive 'forest' land under the forest and revenue departments with little worthwhile forest



cover, which can be converted into productive forest if only the state will distribute reasonable areas of this land to tribal households to enable them to become, with the state's help, silviculturists in a period of six or seven years.<sup>5</sup> This is an entirely employment generating economic enterprise. None of these have received the serious attention of the state that they deserve.

The new orientation of economic policy in India in the last five years is yet to get to grips with the problem of rural poverty. Till then the situation will continue to worsen.

#### NOTES

1. The recommendations of the Working Group were not published until December 1974 when the four-paragraph recommendations were found in a footnote to a document of the Perspective Planning Division of the Planning Commission prepared in August 1962 and published in December 1974 in Srinivasan and Bardhan (1974). From this footnote the public came to know for the first time that, while the Group recommended Rs. 20 per capita per month as the national minimum, it added that, because of higher prices, this minimum should be Rs.25 per capita per month for urban India. There is a mention that the minimum is calculated on the basis of 'physical volume of commodities', but nothing more is said about it.

2. Sukhatme (1965, pp. 22-23): "Calorie requirements [as worked out by the Nutrition Advisory Committee for an, average Indian, average for age, sex, etc., at 2100 calories]....refer to physiological level, that is calories from foods actually consumed. In practice, on the other hand, they are often needed at the retail level, i.e., the level at which food intake is usually measured. Allowance has, therefore, to be made for losses during storage in the kitchen, losses through cooking, wastage on plates and foods fed to domestic

animals.... Altogether, it would seem that the losses between the retail and the physiological levels probably are less than 10 per cent and perhaps as low as 7 or 8 per cent. ...the average per capita (per person) requirement at the retail level for India would be of the order of 2,250 to 2,300 calories."

3. I am thankful to Vidwans for a discussion on this point.

4. The extent of make-believe work and work sharing in agriculture has not been systematically recorded in Indian literature. One is, of course, aware of the steady decline in the hours of effective work in rural India. For a micro level enquiry into the nature and dimension of disguised unemployment in agriculture, see Rath (1983).

5. For an illustrative case, see Rath (1994).

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## **‘GARIBI HATAO’: CAN IRDP DO IT?\***

Nilakantha Rath

*The problem of rural poverty is old and massive. The earlier hope of its mitigation through the percolation of the fruits of general economic growth failed. More land resources could not be made available to the poor. The review of the Integrated Rural Development Programme (IRDP) attempted here shows that the effort to give cattle and other assets too has yielded little. Subsidy appears to be the centre of attraction of the IRDP. It could not be otherwise, the author argues.*

*Eradication of poverty needs a multipronged strategy. The most important, indeed the central, aspect of it has to be the creation of massive wage employment opportunities in rural areas, both on private and public account. Other programmes will then provide opportunities for the able and the enterprising among the poor.*

*It is time resources, organisation and skill are directed to this end, if poverty is to be tackled in the decade to come.*

DURING the last seven years, and particularly during the period of the Sixth Five-Year Plan, which will soon come to a close, there has been a single most important programme for the improvement of the lot of the rural poor, called the Integrated Rural Development Programme. This programme has a history and it is useful to go into it briefly at the outset. The first half of the decade of the 70s was dominated by the widespread concern about the large-scale poverty in rural India. It was estimated that at least 40 per cent of the rural households were poor, and this proportion had remained undiminished despite the not inconsiderable growth in aggregate national income as well as income in the rural sector. The distribution of the additional income generated was very uneven. It accrued in larger than proportionate measure to those who owned land and other productive assets, or were skilled in different types of work. The percolation of this increased income to the poor, who were largely resourceless and unskilled wage earners, was a thin trickle, if at all. There was a growing body of opinion, therefore, that the main attack on rural poverty has to be by endowing the poor with productive assets and/or skills, so that they can employ themselves usefully to earn greater incomes that will help them overcome poverty. Creation of additional opportunity for wage employment was considered essentially

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\*Source: *Economic and Political Weekly*, Vol. 20, No. 6 (Feb. 9, 1985), pp. 238-246.

as a supplement to this, to fill in gaps of seasonal unemployment for a more limited number of people.

Efforts had started in this direction during the Fourth and Fifth Plans, though the formulation had not been in these terms. The Small Farmer Development Agency (SFDA) and the Marginal Farmer and Agricultural Labour (MFAL) development programme, which subsequently got merged in SFDA, were essentially such beneficiary-oriented programmes. These programmes arose in the context of the Green Revolution in which it was widely felt that the small and marginal farmers and also agricultural labourers were not benefited, thereby leading to widening of the gulf between them and the others in rural society. The SFDA was, therefore, designed to facilitate extension of new technology including inputs, like seeds and fertilisers, and additional productive assets, like wells/tube wells, pumpsets, bullocks, farm implements, etc, to farmers who would be in a position to use these successfully to increase their income above the poverty line and simultaneously repay the loans. For the others, there was visualised supplementary sources of income, like dairy and other types of animal husbandry, bullock carts, and small handicrafts, in which provision

for the necessary assets was to be made with loans at concessional rates and subsidy.

By the end of the Fifth Plan, however, the Planning Commission felt that SFDA had not been very successful in attacking the problem of the rural poor. The coverage of SFDA was limited: less than half the districts in India and not every part of these districts at that. The performance had been more in the provision of current inputs than in the provision of additional productive assets, and the landless labourers had not been significantly touched by the programme. Moreover, different agencies were expected to take care of different aspects of the programme and there was no co-ordination among them. The infrastructural developments necessary for the success of such programmes were often lost sight of.

The Planning Commission, in its Draft Sixth Plan 1978-83 (Revised), therefore, reviewed the approach to rural development, specially with reference to the poor. It visualised an integrated plan of development at the block level, within which a special beneficiary-oriented plan for the poor was to be appropriately fitted. After briefly reviewing the various development plans in operation, the Draft Plan said:

21.16. The imperative laid down for the plan for rural areas of the country is increasing productivity through a strategy of growth with social justice and providing full employment to the rural sector within a ten year time frame. As a comprehensive strategy and approach for translating these objectives into specific programmes the Integrated Rural Development now contemplated involves a multi-pronged attack on the problem of rural development. 'Integrated' here covers four principal dimensions: integration of sectoral programmes, spatial integration, integration of social and economic processes, and above all the policies with a view to achieving a better fit between growth, removal of poverty and employment generation. More specifically, it involves a sharp focus on target groups comprising small and marginal farmers, agricultural labourers and rural artisans, and an extremely location-specific planning in the rural areas.

#### **FROM INTEGRATED RURAL DEVELOPMENT TO ASSETS FOR THE POOR**

Consistent with this concept of Integrated Rural Development, the Plan document went forward to propose the formulation of comprehensive block level plans. For this purpose it suggested the growth centre approach and spelt out its implications in terms of linkages, locations, types of additional activities and employment. Then the Plan document went ahead to detail the types of programmes involved in the intergration of the economic activities.

The Planners, however, were conscious that this plan for integrated rural development at the block level was yet to begin in earnest. The Draft Plan, therefore, said:

21.22. The ideas on integrated rural development are gradually being firmed up into detailed action plans. The goal and modalities have already been touched upon earlier. At present the integrated rural development envisaged will be specifically focused on the target group comprising small and marginal farmers, agricultural labourers and rural artisans, whose economic improvement is an important concern of rural development.

Given this approach, the Draft Plan proposed to start the programme in 2,000 blocks and add 300 blocks every year, reaching a total of 3,500 blocks by the end of the Plan period, leaving another 1,500 blocks to be taken up in the next Plan. In regard to the blocks to be taken up, the formulation was in terms of the integrated development plan specified above, with special emphasis on the target group of the poor. The Draft Plan stated:

21.23. In these blocks the endeavour will be to secure full employment in the course of five years through a clearly designed plan of development of local resource potential and productivity, with special emphasis being given to specific beneficiary-oriented programmes. Antyodaya approach will be followed in the identification of beneficiaries starting from the weakest and thus the most needy among those below the poverty line.

The Draft Plan, as I understand it, visualised Integrated Rural Development as a total development plan for the block based on local resources and their productive use. The specific beneficiary-oriented schemes for the rural poor were to be set within this plan, in the sense that these schemes had to be consistent with and form an integral part of the total plan for the block. But the Planners were not sure that this task would be immediately carried out in most blocks. Therefore, as an interim device, it was decided to centre attention on identification of the rural poor and prepare plans for the development of these individual beneficiaries, and call this the Integrated Rural Development Programme. A name appropriate for the whole was given to only a part of it. The Commission set up a Committee to formulate an approach to integrated block development plan. The Committee submitted a detailed approach document. But nothing very much happened at the block level. IRDP continued to be a programme for the improvement of the rural poor, without any overall plan or conception of the total development of the villages within the block.

The emphasis was on provision of assets to the poor: wells and pumps to the small and marginal farmers and milch cattle to the landless labourers. The Draft Plan stated:

21.26. The programme of animal husbandry will be specially oriented to include a good part of rural labour population with special preference to scheduled caste families who are generally a major component of the landless ...

A new Sixth Plan, 1980-85, was formulated two years after the Draft Sixth Plan 1978-83 had been initiated. This plan document also reviewed the performance of SFDA. Besides the rather inadequate coverage, the Plan found poor provision of additional assets for the poor as its major short-coming. It said:

11.3. Furthermore the nature of assistance given to the bulk of them comprised items which did not lead to any specific asset creation. Where, however, assistance has been given for developing minor irrigation sources or for acquiring milch cattle, sheep, goats, poultry, etc., the impact has been significant. The principal reason for a lower coverage under such asset creation purposes has been the progressive erosion in the integrated functioning of the block agency which is the main implementing agency, inadequacy of the credit institutions and lack of co-ordination and adequate support from concerned departments to the agencies' programmes.

The Plan document also reviewed the IRDP as it had been formulated and operated during the two years 1978-80. While recognising the conceptually comprehensive nature of the programme, it noted that in practice it had been no different from the earlier SFDA. I again quote:

11.4. Though conceptually this programme was comprehensive in scope and sought to secure, through a process of block level planning, fuller exploitation of the local growth potential with a view to making an optimum impact on the local poverty situation, in point of fact it has also tended to operate on the same lines at the SFDA.

After, reviewing the different programmes for eradication of poverty, including the special area development plans like DPAP, DDP, etc, the Planning Commission concluded:

11.8. The constraints for which these programmes have suffered have not been financial but organisational inadequacies and lack of a clear cut plan of development of the area to which co-ordinated effort of all concerned agencies could be directed.

Therefore, what did the Sixth Plan (1980-85) recommend? It proposed to replace the multiple agencies in the field for the purpose by a single integrated programme, called the Integrated Rural Development Programme (IRDP). Generally in keeping with the earlier Draft Sixth Plan, it specified the first operational strategy of the IRDP Programme to be the "formulation of a five-year development profile for each district disaggregated into blocks, based on practical (achievable) possibilities of development in agriculture and allied sectors", followed by a series of detailed objectives for the upliftment of the identified poor rural households. However, there appears a clear shift in the

formulation of the IRDP: While the Draft Sixth Plan (1978-83) conceived Integrated Rural Development as a resource based total development plan for a block, into which the specific beneficiary-oriented schemes of poverty eradication will be integrated, and proposed to start with the latter schemes only pending the formulation of block level plans, the Sixth Plan, 1980-85, was quite clear and categorical in stating that the "IRDP has been conceived essentially as an anti-poverty programme" (p 171). In effect, therefore, the Integrated Rural Development Programme (IRDP) became a misnomer: it does not mean what the name implies, but is concerned with only a section of the rural population and a part of the total task of rural development. Unfortunately, it is not just a matter of nomenclature. The idea of preparing a resource based development plan for the district broken into block plans remained on paper. The most that has happened in any district is preparation of an inventory of the physical resources of the district. Indeed, nothing more was expected of the district level agency, as would be clear from the proforma and instructions given for the purpose by the Ministry of Rural Reconstruction in the Manual on Integrated Rural Development Programme (January, 1980). The failure to assess the specific beneficiary-oriented schemes against the availability of needed

resources in the area, their possible use by other than the poor, the demand for the product in the market, etc., before persuading targeted members to accept loans and subsidies, has led to widespread wastages and failures, as we shall note subsequently.

The IRDP was conceived as an anti-poverty programme. The rural poor were small and marginal farmers, landless labourers and artisans. These people were poor, it was thought, because they mostly did not possess any productive assets other than their labour, nor did they, as workers, possess any special skills. Therefore, the Plan document says, "Any development strategy which aims at improving the lot of the poor must aim at creating new productive assets for them". These assets would include sources of irrigation for those with some land, bullocks and implements besides inputs like seed and fertiliser, animals for dairy and other animal husbandry activities, and tools and training for cottage industries and handicrafts, etc. The basic strategy was to promote self-employment of the poor households with the help of these assets so that they may earn incomes above the poverty level. A programme of wage employment for the poor, called the National Rural Employment Programme (NREP) was to

be supplementary to this, to fill in for periods of seasonal and sporadic under-employment.

The Plan stated that on *an average* 10 to 12 thousand of the twenty thousand households in a block were poor. Under the IRDP 3,000 of these poor households on an average per block, at the rate of 600 per year, were to be helped with requisite assets and training, through bank loans and government subsidies, to carry out additional economic activities that will help them rise above poverty. Two-thirds of these poor households were expected, on an average, to be covered by schemes falling in the area of agriculture including animal husbandry, 500 in village and cottage industries and 500 in services. The selection of the beneficiaries was to be according to the Antyodaya principle: all poor households were first to be identified and ranked and the poorest were to be the first to be chosen as beneficiaries under the programme. The provision of assets for the identified households was to be made partly through bank loan and partly through subsidy. The capital subsidy was to be equal to one-fourth of the price for small farmers, one-third for marginal farmers and landless labourers, and was not to exceed Rs 3,000 for any household, except Scheduled Tribe beneficiaries for whom the subsidy was to be 50 per cent of the value of asset, and was not to



exceed Rs 5,000. The Plan provision of total subsidy (Central + state) was to be Rs 1,500 crore and bank loans Rs 3,000 crore, giving a total investment of Rs 4,500 crore for an estimated 15 million beneficiary households, spread over all the 5,011 blocks of the country, during the five years 1980-85. In the process, all these 15 million households were expected to rise above the poverty level.

The Sixth Plan period is almost at an end. The total experience with the operation of the IRDP is almost seven years now, if we take into account the first two years, 1978-80, of the Draft Sixth Plan period. The Approach to the Seventh Five Year Plan (1985-90) proposes "widening and sharpening" of the IRD Programme. It is time the experience with the programme is reviewed to identify its strengths and weaknesses and judge if this approach to eradication of rural poverty holds promises for the next Plan.

Unfortunately, countrywide detailed statistical information, relating to the coverage and consequences of the IRD Programme are not yet available. The state and Central governments have provision for quarterly and annual collection of detailed data from the block

level; but these are not readily available. It is not even possible to get purpose-wise disbursement of loans and subsidy for all the states and India, or even a proper classification of the beneficiaries. Evaluation reports by individual banks into the working of the IRDP in particular districts are available. Individual scholars have also conducted such surveys in limited areas. The National Bank for Agriculture and Rural Development recently conducted a survey into the IRD Programme in two selected districts in every one of 15 states, with the help of a random sample of 100 beneficiary households in each. This unpublished report has been made available to me. I propose to use all these studies as well as the published official information, to review the working of IRDP in the country.

#### NON-POOR BENEFICIARIES

The total number of beneficiary households during the first four years of the Sixth Plan was 12.59 million, assuming that every beneficiary belonged to a separate household and that no beneficiary received help (loan and subsidy).

TABLE 1. TOTAL INVESTMENT AND NUMBER OF BENEFICIARIES UNDER THE IRD PROGRAMME, 1980-84

Item 1	1980-81 2	1981-82 3	1982-83 4	1983-84 5
(1) Total government expenditure (mainly subsidy) (Central + State) (Rs crore)	158.64	264.65	359.59	
(2) Total term credit advanced by all banks (Rs crore)	289.05	467.59	713.98	773.50
(3) Total investment (1 + 2) (Rs crore)	449.69	732.24	1,073.57	
(4) Total number of beneficiaries (in lakhs)	27.27	27.13	34.55	36.90
(5) Per beneficiary subsidy (Rs)	582	975	1,041	
(6) Per beneficiary credit (Rs)	1,060	1,723	2,066	2,096
(7) Per beneficiary investment (Rs)	1,642	2,698	3,107	

Source: Upto 1982-83, "Performance Budget of Ministry of Rural Development, 1984-85". For 1983-84, Reserve Bank of India, "Annual Report". 1983-84, p 51.

twice under different heads, which appears largely true though not universal (Tripathy, et al, 1983). The official data are presented' in Table 1. If the coverage under the programme during 1984-85 is similar to what it was in the earlier two years, then during the Sixth Plan period IRDP would have touched between 15.5 and 16 million rural households. This is more than the targeted 15 million in the Plan. The total number of households in rural India was 90.87 million in 1981. The National Sample Survey Organisation estimated that 50.82 per cent of the people in rural India lived below the poverty line in 1977-78. Assuming this percentage to apply to the rural households and further assuming that this was the percentage of poor households in 1981 as well, we may say that at the beginning of the Sixth Plan 46.12 or approximately 46 million households in

rural India were poor. The IRD Programme had touched 34 per cent of these households. If we add to this the 2 million households covered by IRDP during 1978-80, the percentage of poor rural households covered by the IRDP during the last seven years comes to 38. Surely this is an impressive performance. However, it is to be seen how many of these households were "poor" as per the official definition, and what proportion of these households could use the assets to rise above poverty.

The total bank loans advanced to the beneficiaries during the last four years was Rs 2,241.12 crore. If the banks continue to advance term loans during 1984-85 at the same rate as in the last two years, then the target of Rs 3,000 crore of bank loans for the five years is sure to be reached. The total subsidy provided to the

beneficiaries during the first three years (1980-83) was Rs 782.88 crore. Again, considering the relation between bank loan and subsidy under IRDP, the target of Rs 1,500 crore by end of 1984-85 is sure to be reached. However, it is necessary to remember that while the Plan targets for loans and subsidies were at constant (1979-80) prices, the actuals are at current, higher prices, thereby reducing the real value of total investment below the targeted sum. The per beneficiary investment (loan + subsidy) was only Rs 1,642 in 1980-81, but rose to above Rs 3,000 in 1982-83 and has been of that order since. Thus, on an average, the poor households have been provided with assets worth Rs 3,000 or so, using which they were expected to earn additional income to put them above poverty.

The first point to note is that not all the 12.58 million households who had been identified as poor and covered under IRDP in the four years 1980-84 really belonged to the category of "poor". The Ministry of Rural Development laid down in 1979-80 that all households with a total annual income of less than Rs 3,500 or an annual per capita income of less than Rs 700, in the survey to be conducted in 1980 with reference to the year 1979-80, were to be treated as poor. A number of evaluation studies of IRDP, show that a not insignificant proportion

of the identified poor households had in fact incomes higher, some times much higher, than the stipulated sum.

The Kerala Planning Board Survey (1981) showed that on the basis of annual income about 23 per cent, and on the basis of per capita income about 19 per cent of the beneficiary households had been mis-classified as poor.

A survey by Krishnan (1984) in a Calicut village (Kerala) showed that on total household income basis only 20 per cent were poor; on per capita basis 36 per cent were poor; the rest, 64 per-cent were not poor in terms of their pre-IRDP income.

The NABARD Survey (1984), however, showed that among the sample beneficiary households in Mallapuram and Trivandrum districts hardly 2 per cent had been misclassified.

In Rajasthan, Ahuja and Bhargava (1984) reported 14.7 per cent as misclassified in Jaipur district; and NABARD (1984) reported 21.4 per cent misclassification in Jodhpur district.

The Central Bank of India (1983) found 28.3 per cent in Chindwara district (MP) misclassified as poor. NABARD (1984) found this percentage to be 20.4 in districts of Bhopal and Satna in MP.

In Surat district of Gujarat, Jain (1984, July and September) found in two talukas 10 per cent of the beneficiaries having income above the poverty level at the time of the identification survey.

NABARD (1984) found in the two district of Junagarh and Valsad in Gujarat 47 per cent of the sample beneficiaries with higher pre-investment income than the maximum stipulated.

In the Canara Bank (1984) study in two Tamil Nadu districts, 25 per cent of the beneficiaries were found to have higher per capita income than stipulated.

Tripathy, et al (1983), in their survey of SFDA/IRDP in Puri district of Orissa that 13 per cent of the sample beneficiaries were clearly ineligible under the scheme, in terms of their landholding, partly due to faulty land records. "In a large number of cases persons do secure subsidy and bank credit although their known sources of income from farm and non-farm activities would make them totally ineligible for such assistance" On the other hand, the NABARD (1984) survey in two districts in Orissa puts the percentage of ineligible beneficiaries at 1.5.

The NABARD (1984) survey shows the percentage of beneficiaries wrongly classified to be 42 per cent in Assam,

17.76 per cent in Haryana, 35 per cent in the Punjab, 19 per cent in MP and 13 per cent in Maharashtra. As against this, the survey showed 11 per cent misclassification in the surveyed districts of Tamil Nadu and Karnataka, 7 per cent in AP and hardly one per cent or less in Orissa, Bihar and Uttar Pradesh.

Thus, the survey shows wide variation in the misclassification of the households as poor. On the whole, however, it would not be improper to suggest that at least 15 per cent of those identified as poor and helped under IRDP did not really belong to the category of the poor. Such wrong identification is inevitable, considering the agency entrusted with the work, the nature of the questionnaire prescribed for the purpose and the time set aside for work.

TABLE 2: PURPOSE-WISE DISBURSEMENT OF NABARD REFINANCE FOR IRDP

Purpose	(Rs crore)	
	During 1982-83	During 1983-84
(1) Minor irrigation	24 (13)	33 (14)
(2) Dairy development	55 (30)	61 (27)
(3) Sheep/goat/piggery	24 (19)	21 (9)
(4) Bullocks, bullock carts, camels, camel carts, etc.	35 (19)	52 (22)
(5) Industry, services, business (ISB)	15 (8)	52 (22)
(6) Others	32 (17)	14 (6)
Total	185 (100)	233 (100)

(Ministry of Rural Reconstruction, 1980.) Naturally it leaves ample scope for favouritism and corruption. Once the block level official agency (the District Rural Development Authority and its agents) classifies a household to be poor and recommends its case for loan assistance for a specific enterprise, the bank does not verify its present and expected income position, which it would otherwise normally do. The expected incremental income is also estimated on the basis of norms developed for this purpose by the DRDA, and the banks do not normally verify this. Thus, once classified by the DRDA as a poor household, there is no possibility of a counter-check.

One may ask, why is it necessary for the DRDA to do all this? After all, in order to disburse term loans the banks have to ascertain the pre-investment as well as possible incremental income on the loanee; and if any subsidy is to be paid on the basis of pre-investment income then the bank scrutiny can be sent to the DRDA or any appropriate agency. The real reason appears to be that not only 600 poor beneficiaries have to be selected every year-even that may not be very difficult-but also that they have to be selected on the Antyodaya principle, that is, they must be the poorest of the poor. Because of this requirement to start from the bottommost household and move upwards, one must first identify all poor

households and rank them in order to select the poorest 600. The inevitable difficulties involved in ascertaining incomes of households through the prescribed survey, has led to current efforts to find out proxy indicators of poverty which can be more easily used in a quick survey. It is not difficult to visualise that no proxy indicator can be fool-proof in identifying individual households as poor. The real trouble is the Antyodaya approach. The idea that the rural poor can be mainly helped by giving them productive assets and that the poorest must be first attended to in these terms, appears to be running against facts. We shall turn to this subsequently.

It may be mentioned here in passing that the Antyodaya approach in selecting beneficiaries is not being strictly followed everywhere. The NABARD (1984) survey of 30 districts of 15 states shows that while in the selected districts of Kerala, Madhya Pradesh, Maharashtra and Rajasthan, only 20 to 30 per cent of the identified poor had been helped with loans, some of these beneficiaries belonged to the highest income bracket (Rs 3,000-3,500), in some cases in significant proportions. The situation is basically not very different in many other states. One would expect the poorest to be covered first; but this information leads one to suspect that that is not always done.

The effort of IRDP to cover the poorest does not also appear to be in proportion to the dimension of the problem in different blocks. The Planning Commission had estimated an average of 10 to 12 thousand poor households per block, from out of which 600 were to be covered every year for five years. However, this average has come to be applied to every block in the country. The result is, while in some blocks all identified households have been covered, in others only a part of it (NABARD 1984).

#### IMPACT OF DAIRY PROGRAMMES

The major type of asset creation for which loans (and subsidies) have been given in livestock, including dairy animals, goats, sheep, as well as for bullock and bullock carts and camels and camel carts. Unfortunately, purpose-wise classification of total loan and subsidy under IRDP at the all-India level is not available. Table 2 gives the total refinance made by NABARD for the purpose to the banks, classified purpose-wise. It is necessary to remember that NABARD refinancing accounted for 25 to 30 per cent of the total loans by all banks for IRDP. It is likely that the purpose-wise classification of NABARD refinance gives a broad indication of the pattern of total investment under IRDP.

This distribution is broadly similar to that of the sample beneficiaries of the NABARD (1984) survey, not confined to NABARD refinanced loans. That survey shows that 40 to 50 per cent of the investment, as also of the beneficiaries, related to dairy, goats and sheep. Bull-ocks, camels, with or without carts, accounted for another 20 per cent, minor irrigation accounted for 13 or 14 per cent, and non-farm activities (ISB) for nearly a quarter. The various surveys show that in many districts/regions financing for livestock was on a still larger scale. Direct agricultural lending, like for minor irrigation, was significant in better rainfall regions, particularly in the southern and eastern parts of India, while it was very small in the dry or arid regions, where livestock was the mainstay of the programme. This great emphasis on dairy and animal husbandry is not unexpected; the Planning Commission in the Sixth Plan (1980-85) had put major emphasis on this for the marginal farmers and landless labourers who constitute the bulk of the rural poor.

Information from the available surveys shows that IRDP assistance under dairy as well as under goat and sheep schemes had very limited impact on the poor. The evidence is summarised below. It may be noted that excepting three surveys, NABARD (1984), Ahuja, et al (1984) and Jain (1983, a, b) all the other studies

have made no adjustment for rise in prices in defining the poverty line income, nor have they made adjustment for those who were already above the poverty line before IRDP in estimating the number who rose above poverty line.

The Jaipur study (Ahuja, et al, 1984) shows that less than half (45.7 per cent) of the recipients of loans for the purpose were left with the asset at the end of two years: the others had either sold it or the animal was dead. An even smaller per cent of agricultural labour households, 34 per cent was left with the animals. The real problem was poor availability of common grazing land, inadequate supply of fodder and feed, particularly in case of the landless, and the high cost of maintaining the animal during its dry period. Only 18 per cent of all loan recipients in this category could move above poverty line in real terms, though others registered some increase in income. However, if repayment of loan plus interest is adjusted against this income, this proportion would go down considerably. This fact that the loan repayment instalments have not been adjusted before calculating net incremental income is common to all studies reviewed here and have also to be kept in mind while assessing the evidence.

In case of sheep and goat, the situation was in some sense worse. Three-fourths of the beneficiaries were left with some of the animals; the rest had been fake purchasers. Furthermore, the mortality of the sheep as well as the lamb was very high: in a single year 42 per cent. The landless labour beneficiaries were the worst off in this matter. In case of goats, it was only a little less so. The main reason for high mortality was diseases and inclement weather and the fact that against hot wind the animals had no shelter. (There was only a little for their new owners!) Veterinary attention was also poor. No wonder the incremental income was paltry, and only one household could rise above poverty line. Similarly, nearly half (48 per cent) of the beneficiaries given camel with cart, had sold the camel or cart, though of the remaining more than 75 per cent moved above poverty line.

A survey by the State Bank of Bikaner and Jaipur (1984) in Bikaner district showed that most of the beneficiaries, who were mainly landless, had acquired camel-carts, cows or buffaloes, or sheep and goats. However, a large proportion was without these at the time of survey; 28 per cent had sold the assets or these were dead, and another 22 per cent were unwilling to show the assets, leading to suspicion of non-existence. The survey by PNB (1984) in Alwar district paints a

similar picture. Nearly 30 per cent of the milch cattle and 64 per cent of the camels with cart had been sold or were dead. The landless found maintenance of milch cattle during their dry period very difficult. Half the sheep had perished, mainly due to lack of shelter from very hot winds in summer.

Jain (1984a,b) studied the IRDP in two taluks of Surat districts, Gujarat, where the scheduled tribes were the main beneficiaries, and milch cattle accounted for the overwhelming proportion of investment. In the developed irrigated taluk of Bardoli, nearly 22 per cent of the beneficiaries were without their assets at the end of two years. Half the households with dairy animals had registered some increase in real income (calculated by adjusting for price changes), while the other half had suffered a decline. Even those that gained in income would show a much poorer result if the repayment of loans is deducted from the increment of income. And all this in a highly developed and irrigated area where fodder supply was inadequate and the labourers were familiar with dairy animal management. The survey shows that it is the middle income recipients among the poor who gained. The poorest could not; instead, their numbers swelled.

In the backward forest-clad taluk of Uchchhal, 17 per cent recipients of assets, mainly cattle, were not in possession of these at the end of two years. In terms of real income, 61 per cent suffered a loss of real income while 39 per cent had gained some; but very small proportion of households could rise above poverty in terms of real income.

The State Bank of Hyderabad's survey (1983) in Andhra Pradesh, Karnataka and Maharashtra showed that of the total loan recipients for milch cattle, sheep, goat bullock with or without carts, the leakage was as high as 32 per cent. These people just collected subsidy by showing their existing assets as being fresh purchases. The 38 per cent increase in income in these animal husbandry enterprises was in current prices; adjusted for price rise and repayment, no real increase in income may be left. It is interesting to note that in case of loans for minor irrigation leakage was as high as 50 per cent; wells were either not sunk or only a pit dug, and subsidy collected.

The Canara Bank study (1984) in the two Tamil Nadu districts of Tirunelveli and Periyar shows that IRDP was for only three purposes, dairy, bullock (including carts) and sheep. But only 28 per cent of the beneficiaries showed any improvement in their asset position at the time of survey. The rest had either sold the



animals or replaced their earlier animals with these. Drought conditions had led to distress sale of animals.

The Kerala Planning Board's survey (1981) showed that while misutilisation of loans was rather small (only 9 per cent and partial misuse by another 17 per cent), there was generation of no additional income in case of 31 per cent of beneficiaries. This percentage was even higher in case of goat and poultry enterprises, as also for wells, crop loans and loans for land development. In case of dairy animals, the main problem of the marginal farmers and the landless was the availability of fodder and the high cost of purchases.

The NABARD (1984) survey shows a high proportion of 26 per cent of leakages of loans for animal husbandry, about half of it due to misuse of loan and the other due to sale of animals. The survey does not give enterprise-wise account of performance in terms of income. But it summarises the findings relating to different enterprises in general terms. In regard to animal husbandry, it says that except in Punjab, Haryana, UP and Gujarat the milch cattle supplied were of relatively poor quality and poor yielders. The difficulty was that animals of better breed and yield were not available in such large numbers. As a result, the price of the poor cattle purchased under IRDP

loan went up. Veterinary support was poor in most states. Sheep and goat were susceptible to climatic variations, and inappropriate breeds led to heavy mortality in some areas. Inadequate availability of green and dry fodder, particularly to the landless, who were the main receivers of milch cattle, was another serious problem, especially in the unirrigated and low rainfall regions, though even in other regions the problem was not unimportant. In fact, the survey shows that poor incremental incomes were noticed in such districts where animal husbandry projects dominated the scene. There were also doubts about the longer sustainability of those animal husbandry enterprises which had shown some success in the first 2 or 3 years.

What was true of dairy and other animal husbandry schemes was also true to a greater or lesser extent of others. Bullock and bullock-carts could be successful as sources of additional income only if in effect the number thus helped was relatively small. Large numbers led to poor use of all the units, and low income. The same was true of all craft training under TRYSEM: more tailors, potters or brickmakers or cart owners led to poor employment and income of all.

Minor irrigation loans showed better performance than others, though here again failures and misutilisation was high

in drought prone areas, and in areas characterised by very small holdings. The studies in the Deccan plateau, Kerala and Orissa bear this out.

The ISB schemes had mixed results. Cottage industries of specialised type, like weaving, metal pots, or even cobblers, etc, recorded better performance particularly where marketing was better. Trading establishments, on the other hand, had more doubtful results, partly because many beneficiaries were suspected not to be poor, and in other cases, there was no scope for more than one or two shops in the village.

#### **HOW MANY LIFTED ABOVE POVERTY LINE?**

The IRDP was expected to cover nearly 15 million poor households who were expected to be lifted above poverty by the end of the Sixth Plan period. What has been the result in these terms according to the various enquiries?

The NABARD survey shows an overall leakage of 20 per cent. The percentage of beneficiaries whose income had risen above the poverty line of Rs 3,500 came to 47 per cent of all eligible beneficiaries (i.e., excluding the 15 per cent who were not poor), or 40 per cent of all beneficiaries. There was considerable variation among states. But these are in current prices. When adjusted for price

changes between 1979-80 and the survey period it was found that only 22 per cent of the eligible beneficiaries, or 18.7 per cent of all beneficiaries had been able to cross the poverty line. The selected districts in state like Punjab, Haryana, Uttar Pradesh and Maharashtra showed a better performance with more than 40 per cent rising above poverty line, while Rajasthan, Tamil Nadu and Andhra Pradesh showed 10 per cent or less performance.

In Jaipur district in Rajasthan (Ahuja, et al, 1984) 23 per cent of all beneficiaries had crossed the poverty line. In Bardoli Taluka only 16 per cent of the beneficiaries could cross the poverty line. In the relatively backward Taluka Uchchhal there was no rise in real income for most (Jain, 84 a, b). In the other surveys the incomes have been estimated for this purpose only at current prices. Therefore they give much higher estimates of the proportion of households rising above poverty line than would be the case if real income differences were calculated. Properly adjusted figures are not likely to show the percentages of those crossing the poverty line to be higher than what has been indicated earlier. In fact, putting the beneficiaries who had been able to cross the poverty line at 20 per cent of beneficiaries (not counting those beneficiaries who were already above the poverty line) would appear to be on the high side.

It has been mentioned earlier that in calculating the post-investment net incomes, none of the surveys had deducted the annual repayment instalment as cost. If this legitimate expense is taken into account, the percentage of beneficiaries who might have crossed the poverty line will come down very considerably. In fact, in many instances it would appear that the beneficiaries were having some extra income only because this expense was not deducted. Their incremental income was only the unpaid dues of the banks.

From this evidence it is clear that the IRDP has come nowhere near its object of raising at least a third of the rural poor above poverty. By the end of the Sixth Plan period, some 17 to 18 million rural households would have been covered by IRDP. At least 15 per cent of these would not belong to the category of the poor. Therefore, one can say that at most 14.5 to 15 million poor households in rural India would be covered by IRDP by March 1985. These constitute one-third of the estimated number of poor households in rural India in 1981. It was seen above that not even 20 per cent of these poor households might have crossed the poverty line as a result of IRDP. This means that about 6.6 per cent of the poor households in rural India would have been helped to earn higher than poverty level income. Again, we have noted that

this 20 per cent was a gross overestimate, because their incomes included the loan instalments, which appropriately belonged to the banks and not to the beneficiaries of IRDP. If this is adjusted, the proportion of beneficiaries who would have really risen above poverty would come down to less than 10. Therefore, it would not be far wrong to estimate that at the end of 7 years of operation IRDP about 3 per cent of the poor households in rural India would have been helped to live above poverty, even if for a while only.

There would of course be a larger proportion of the poor households who would have gained some extra real income, though they would not get over the poverty line. In case of most of them, the real incremental income would be rather small.

There is no guarantee that the picture that emerges at the end of one, two or three years after the receipt of the asset by the households would be sustained over the later years. Drought, disease, etc., may suddenly lead to the end of many such enterprises. Prices and marketing facilities may become adverse. All in all, it need not come as a surprise if another round of NSSO's consumption expenditure survey in the middle of the 80s shows no visible impact of the IRDP on the dimension of poverty in rural India.

#### NOT AN ADMINISTRATIVE FAILURE

This rather meagre outcome of a programme on which so much stress has been laid for eradication of rural poverty naturally raises the question, why this? Many reviews as well as enquiries refer to the failure of the agencies administering the programme, as also to the inadequate provision of infrastructure. They point to the poor quality of animals purchased under the scheme, the poor veterinary facilities, the poor facility for marketing of the product, the inadequate and uncertain supply of fodder and feed, the very small size of holdings (in the context of minor irrigation), the absence of consolidation of small holdings, the poor extension agency, as well as smaller amount of loans than necessary, etc, as reasons for the failures under IRDP. A careful examination of these would, however, indicate they are not administrative failures, in the sense that more careful administration, with larger number and more motivated personnel, can convert the bulk of failures into success. It has been widely observed that the milch animals are of an inferior quality, except in a few states where the local breeds are of a superior quality. As against the prescribed norm of animals that give 6 to 7 litres of milk a day, the animals purchased most often give 2 to 3 litres. Many are older than prescribed and are in the declining stage of their productive life. It is true that the purchases

are often not properly supervised and certified; they are locally obtained rather than from distant markets where better breeds may be available. But the basic point is, would milch animals in such large numbers be available every year, if only the programme administrators took care? More than a third of the total number of beneficiaries have purchased milch cattle. This comes to about 5 million cattle in five years, or a million a year, spread over all the 5,000 blocks in the country. Are specified high yielding buffaloes and cross-breed cows available in such numbers for the beneficiaries to purchase? In the absence of these, the targets can be achieved by buying anything that is available. It results in wastage and corruption. Everyone stands to gain from it; the seller through high price for nondescript cattle, and all others including the beneficiary from subsidy, insurance and even the loan, unrepaid. Financing agencies sometimes in desperation plead for financing of cattle breeding farms for the purpose. This is no doubt called for. But what must be appreciated is that considering the urgency and dimension of the targets set, they can be of little avail during a single Plan period. Supply of feed and fodder is another handicap. But this depends on the total availability of fodder in the village, the positive prospects in this direction in the immediate future, and the demand for it by the farmers themselves who produce

it. This is what the integrated block plan was supposed to provide. In the absence of this the financing agency is left to hope that the marginal farmers and landless labourers will be able to procure the fodder and feed. In regions like Rajasthan, the new shepherds often find the village common inadequate for grazing by all the animals, including their own. The sheep of the beneficiaries in Rajasthan recorded high mortality, because of inclement weather, and consequent disease. The landless with hardly room to live, cannot provide shelter to the flock, and loan for the purpose may end in making a bad proposition worse. There is hardly any assessment of how many animals of different types the village economy can reasonably sustain, how much the non-poor are likely to have, with or without loans, and how many the poor can maintain.

This failure to assess the potentiality of the economy to sustain a given number, from the supply side, is also noticed on the demand side. There has been frequent complaint about non-availability of infrastructure like government milk collection (purchase) centres. This complaint is genuine. But what is at the same time necessary is to find out if the total estimated milk collection from a village can reasonably pay for the starting of a collection centre. A

cluster approach in choice of beneficiaries under the programme has been advocated for the purpose. But this has not always been adhered to, largely because targets have to be reached, and better ideas or schemes may not be available for other villages. Moreover, there is no proper assessment of how much milk the market can absorb at the specified price. It is the experience in the irrigated tracts of Maharashtra that increased supply in the villages is often not lifted by the Government Milk Scheme under one pretext or the other. Bullock and camel carts when given in larger numbers than the demand for their services in the market warrants, have resulted in poor income for most. The same with programmes like promotion of tailoring, pottery, carpentry, wiremen, and retail shops. Demand is severely limited, and supply in excess results in poor incomes for everyone.

A proper assessment of the potentiality of such enterprises in the rural areas would show that it is much smaller than what is targeted. If this has not always shown up in the form of excess supply, it is because of large scale failures or inadequate successes of individual enterprises.

It would be useful to note here that the success of such programmes often tends to be judged by the financing institutions

and others from the loan repayment performance of the beneficiaries. The IRDP studies have generally reported reasonable repayment. But one factor that has not been taken into account in this regard is the payment of subsidies by government, which come to the banks and are adjusted against loans as repayment, thereby showing a satisfactory repayment performance. Moreover, even proper repayment may not necessarily indicate success in the real sense. Apte (1983) in his study of a large financing project for purchase of milch animals by farmers and others shows that while 84 per cent of the loans had been repaid to the banks—a very creditable achievement—more than 80 per cent of the beneficiaries had wound up their business by selling the animals and repaying the loans, because they did not find it worthwhile. It is very likely that these animals were purchased under a similar scheme in a neighbouring area. It is the story of the same animal going round with different beneficiaries, the net ‘benefit’ being the subsidy.

A further aspect stressed in IRDP is helping the poorest of the poor on a priority basis. The surveys that have gone into this question carefully show that when there is large scale failure of any scheme, it is the poorest of the poor, the landless agricultural labourers, who as a

group have fared the worst. This is particularly so in case of dairy and other livestock enterprises which have been the mainstay of this class. The trust that the poorest in rural society can be helped to come up by being given some productive asset on loan, does not appear to be justified by experience. The poorest who are at the bottom rung of the economic ladder do not get proportionately larger loan and subsidy compared to those above them. Apparently, everyone, very poor and not so poor, is expected to rise above poverty with a given amount of assets. The logic is not clear. Furthermore, in such a situation, there is no reason why agencies involved would concentrate on the poorest first. Besides the problems listed earlier, it is necessary to remember that the poorest in rural society are often the aged and the physically handicapped households, as well as those with very large dependency load. The surveys into IRDP have not gone into this question. But the study into Antyodaya by the Programme Evaluation Organisation of the Planning Commission (1982) had shown this element to be quite large in many of the surveyed states. The fact is, these cannot be helped by assets. And the rest find it, understandably, more difficult than others to use the assets effectively to be able to increase their incomes in a sustained manner.

This long review of IRDP experience brings out clearly one fact: the strategy of helping the poor in rural society to get over poverty with the help of assets given to them, is largely misconceived. Only a small proportion could be helped; what is equally true is that only a very small proportion can be helped in this manner. Putting more burden on this approach will discredit the line of attack, generate wastage, corruption and ultimately cynicism. In a multipronged attack on rural poverty this approach surely has a legitimate place, but it cannot be the mainstay of such a programme.

It may be argued that, after all, this is how the rural poor have visualised the solution to their problem. The government directives wanted the DRDAs to obtain their preferences from every identified poor household. Many enquiries show that in implementing the programme these preferences have largely been adhered to. However, it is unfair to the poor to pass on the responsibility in the matter to them. The poor basically need more income. And when they come to learn that the government is willing to give them resources to help them increase their income, they express their preference on the basis of (a) what they find to be providing an income base with others, or (b) what they find the government willing to give, and finally, (c) whether there is subsidy attached to it. For long

they had seen that having land of one's own gives greater income; so they asked for land, and there was an impression that the government will be able to give land. That did not work; not even one per cent of the poor got land under redistribution of the ceiling surplus. Under IRDP they came to learn that the banks will give loan and government subsidy for buying a cow or a buffalo, a herd of goat or sheep, a well or a pump, a bullock-camel cart or sewing machine. So they opted for one or the other. They know about the subsidy and decide that if that is all that is available, why not go in for it? The poor cannot be choosers; they must take what comes. The truth is they want income, not land, animals, etc. It is upto the state and the Planners to think about what are the most meaningful alternatives available.

#### **CRITICAL ROLE OF EMPLOYMENT CREATION**

The most meaningful way the bulk of the poor can be provided greater income to enable them to rise above poverty is greater opportunity of employment at least at the basic subsistence wage rate. Any one who is wanting employment at this wage rate and willing to put in the necessary amount of work, should be provided with opportunity to earn his income in this manner. In this there is no demand on his entrepreneurial skills, no worry about repayment of a loan and no demoralising pursuit of a subsidy. Once

large scale opportunity for greater earning through wage employment is created for the poor, this will create greater purchasing power for them and larger market for the commodities produced in rural areas. Then the more able and enterprising amongst them will explore possibilities of bettering their lives by producing such and other products for the market, be this milk or meat, footwear or garments, shops or services of various kinds. A special programme for them will then be more productive, without the corrupting bait of large subsidy. The banks also can then be expected to cater to the needs of the term loans of such entrepreneurs. Today, no one, including a bank field officer, has time to examine the flood of proposals. It has been estimated that if a bank field officer is required to handle 200 cases in a year, there have to be at least 75,000 bank field officers for the job (Venkatraman, 1982). If it were useful, it should be done. But as it turns out, the bulk of it is sheer waste. A large-scale programme of assured wage employment for the rural poor will make the relevant part of what is IRDP today productive and worthwhile.

The Sixth Plan, unfortunately, gave a secondary place to the programme of generation of additional wage employment in rural areas. The National Rural Employment Programme (NREP) was designed to provide supplementary

employment to the rural poor during the periods of seasonal unemployment. The Plan had budgeted Rs 1,600 crore for this, while for IRDP the total estimated expenditure, including loans, was Rs 4,500 crore. In fact, during the two years 1981-83, NREP spent Rs 705 crore and provided wage work for 3,523 lakh man-days per year. Assuming that for full employment a worker works for 300 days a year, it amounts to providing full time wage work to 1.17 million workers in rural India. What proportion is this of the total number of persons in the working age group in the poor households in rural India? Assuming that about half the persons are in the working age group and half the rural population was poor, the 1981 census gives the total number of poor persons of working age to be about 126 million. Therefore, one can say that NREP provided equivalent of full time wage employment to less than one per cent (0.9 per cent) of the working age population among the poor households in rural India. As against this, IRDP was designed to reach and provide resources to 15 million households. The announcement by the Prime Minister of a special employment programme for the landless labourers leads one to think that the Government of India had come to realise the limitations of IRDP as a programme for the poor. Nevertheless, there is no indication yet that generation of wage employment on a large scale in rural



areas is going to be main programme, to be supplemented by others. Attention in this context may be turned to the Employment Guarantee Scheme (EGS) of Maharashtra under which at least 10 per cent of all working age persons in the weaker section or poor households in rural Maharashtra have been provided the equivalent of fulltime wage employment (Dandekar, 1983). Contrast this with NREP or IRDP. A similar approach is necessary for the country as a whole, particularly in states exhibiting widespread rural poverty.

Policies to generate greater rural employment cannot be confined to public sector programmes like NREP or EGS. There is scope for greater income and employment generation and its wider dissemination in the field of agriculture. Studies on large-scale irrigation projects in the plateau region of India, where water is the scarcest factor in agriculture, show that the present use of irrigation water is not generating the maximum net income per unit of water. If policy is changed to achieve this, irrigation water can reach many more acres, and many smaller farmers can increase their income in the process. In some of the eastern states both flow and lift, irrigation is characterised by poor use of water and very small generation of additional income. Policies appropriate to increasing intensity of

cropping can greatly increase employment and income. Lift irrigation schemes are failing to deliver the goods due to widespread fragmentation. Policy measures to bring about consolidation can improve the prospect of greater employment in agriculture. Furthermore, policies sometimes appear to conflict with one another. While IRDP and NREP are being directed to generating greater rural employment, the National Bank of Agricultural and Rural Development has decided to permit refinancing of loans for purchase of combine-harvesters at concessional rate of interest. A study in Punjab, Haryana and in western UP not too long ago has shown that while it takes 9.5 man-days to harvest one acre of wheat manually, with combine harvester only 0.5 man-day will be used, rendering 9 man-days per acre unemployed. The large body of migrant labour from Bihar and eastern UP, working seasonally on the irrigated plains in the north, will in the process be thrown out of employment. It is peculiar, to say the least, that while on the one hand special programmes for greater wage employment are being created, on the other policies leading to drastic reduction in employment in the farm sector are being promoted.

Similarly, lack of development of infrastructures, like roads, water supply, veterinary services, electricity, regulated markets, primary health centres, schools,

etc., have been frequently mentioned as obstacle to proper implementation of development programmes in agriculture and allied activities. The relatively poorer areas are often characterised by low level of development of such facilities. Given the Plan resources for the purpose, one would have expected less developed areas to receive greater attention in these matters, so that any specific sectoral development schemes can be carried out effectively. But this has not happened. The failure is at the ground level as well. The recent Maharashtra State Committee on Regional imbalances has shown in its Report that while the state government was giving nearly 40 per cent of the total Plan funds to the District Planning and Development Councils for allocation and expenditure as per the requirements of the districts, the local needs of specific infrastructure development did not receive necessary priority from the DPDCs. The Committee, therefore, has recommended a formula by which resources shall be earmarked for the purpose for different districts, nay Talukas, and implemented. The district level authorities shall have no option to change allocations. This is a larger question related to local planning. It is raised here to point out that failure of infrastructure development is widespread and what is needed is a more systematic effort at its development and distribution than has been attempted so far. This will not only

make possible greater development of infrastructures in areas that lack it, thereby improving the feasibility of specific development schemes, but also create greater wage employment opportunities in these works.

The problem of rural poverty is old and massive. The earlier hope of its improvement through the percolation of the fruits of general economic growth, failed. More land resources could not be made available to the poor. The IRDP experience of giving cattle and other assets has, as we have reviewed, come to little. Subsidy appears to be its centre of attraction. As we have argued, it could not be otherwise. Eradication of poverty needs a multipronged strategy. But as things stand, the most important, indeed the central one, has to be the creation of massive wage employment opportunities, both on private and public account, in rural areas. Then the other programmes will provide opportunities for the able and the enterprising among the poor. It is time resources, organisation and skill are directed to this end, if poverty is to be tackled in the decade to come.

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## A BUDGET FOR FARMERS!\*

Nilakantha Rath

*The impression that this year's central budget is a farmer's budget is factually wrong. If anything, the central sector plan allocations for agriculture, irrigation and rural development are lower in 1988-89 than in 1987-88. The finance minister has made somewhat larger budgetary provisions for improvement of rice production in eastern India, improvement in oilseeds production, help to small and marginal farmers, and on Command Area Development that may help a certain body of farmers in a limited way. On all other accounts the real budgetary provision is less than in the past. The tax concessions are confined to very limited number of potential beneficiaries. On the contrary, the interest rate policy, which is meant to provide an unsought benefit to a large body of farmers immediately, holds out ominous consequences for financial institutions and, if persisted with, will cost the cultivators dear.*

THE Central Budget for 1988-89, Investment in agriculture is largely private: during the Sixth Plan period less than a quarter of the gross capital formation in agriculture was in the public sector. Capital outlay by the central government in agriculture (including rural development, irrigation and flood control) constitutes less than one-third (31 per cent) of the total public sector outlay under these heads in the Seventh Plan. This puts severe limits to the ability of the central budget to make serious direct impact on total investment in agriculture. It would be instructive to go over these three aspects of the central budget.

### CENTRAL PLAN OUTLAY

Capital outlay by the central government forms a very small part of the total national capital outlay in agriculture.<sup>1</sup>

The finance minister stated in his budget speech that the proposed central plan outlay on agriculture for the year 1988-89 is about 40 per cent higher than in the previous year. In fact, the total of

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\*Source: *Economic and Political Weekly*, Vol. 23, No. 14/15 (Apr. 2-9, 1988), pp. 739-741+743-744

the central plan outlay on agriculture, rural development and irrigation and flood control in 1988-89 is only 12 per cent higher than the sum budgeted for 1987-88, and 0.6 per cent lower than the revised budget figure for that year (see Table 1). Even if one takes 'agriculture' alone, the increase over the 1987-88 budget is 18.2 per cent; compared to the revised budget estimate for 1987-88 it is lower by 6.8 per cent! The finance minister was apparently referring to the first three statements of Demand for Plan Expenditures (Demand Nos 1, 2 and 3) of the ministry of agriculture. The proposed plan expenditures for 1988-89 under these three heads are 40 per cent higher than the budgeted figures under these heads in 1987-88; compared to the revised budget estimates for 1987-88, these are about 25 per cent higher. However, it is necessary to remember that these demand items of the ministry of agriculture include items (with large expenditures) that are not part of the outlay on agriculture and exclude many (featuring under other demand heads) which form parts of the agricultural sector. If the finance minister had used the relevant figures for comparison, the impression created would have been the reverse.

In point of fact, the budgeted plan outlay in the agricultural sector (including rural development and irrigation)

for 1988-89 is marginally lower than the revised estimates for 1987-88. Indeed, compared to the earlier three years of the Seventh Plan period, the share of agriculture, etc, in the total central plan outlay for 1988-89 is the lowest: 10.65 per cent; in the earlier three years the revised estimates were 11.1, 11.03 and 11.96 per cent, respectively (Ref Table 1.)

The plan outlay figures are in current prices. For comparison with, the Seventh Plan proposals, it is necessary to express these at 1984-85 prices at which the plan estimates were prepared. The only price indices available up to the end of 1987 are the wholesale price indices, and they are not useful for estimating plan outlays at constant prices. The implicit price index of gross capital formation in the economy as a whole in 1985-86 (first year of the Seventh Plan), with 1984-85 as base, is found to be 109.15; for gross capital formation in the public sector, 112.9; and for gross capital formation in agriculture in the public sector, it was 115.2. Compare this with the wholesale price index which was 107.1 in 1985-86 (1984-85 = 100). These, as well as the implicit price indices for 1986-87 (from the quick estimates for 1986-87 put out last month by the CSO) lead one to believe that the real plan outlay, in 1984-85 prices, has been much less than necessary during the three years

1985-86-1987-88, and the share of agriculture, etc., would be even lower than indicated by current price estimates, since the implicit price index for capital formation in agriculture in the public sector has been rising faster. (One looks forward to the mid-term appraisal of the plan for further light on this.) It implies that the central sector plan outlay in agriculture, etc., in real terms, has not been increasing, but if, anything, declining. And next year (1988-89) it would, most likely, be worse than the levels-so far.

The decade of the 80s has witnessed a steady decline in real public sector investment in agriculture, not only in terms of share in total investment but also in absolute terms. During the Sixth Plan period the total public sector investment in agriculture was about 23 per cent lower than what had been planned, while the overall public sector investment was only 11 per cent short of planned (at constant prices). The Seventh Plan's proposed public sector investment in agriculture was just about the same, in constant prices, as the actual Sixth Plan performance, while the overall public sector investment in the Seventh Plan was put at a much higher level than the Sixth Plan actuals.<sup>2</sup> This lowering of public sector investment in agriculture in the Seventh Plan appears to be getting strengthened, if the trend of the central sector plan

outlay on agriculture, mentioned above, is indicative of the state of affairs in the state sector as well. Under the circumstance, it is improper to convey the contrary impression, as the budget speech might lead the unwary reader to think. If the political authorities, on their part, believe this, it would be distinctly harmful.

While the overall central plan outlay on agriculture, etc., has not increased compared to the revised budget estimates of 1987-88, there has been significant increase under some specific heads (Ref to Table 2.) These are, (i) centrally sponsored scheme for production of rice in eastern states; (ii) national oilseed development project and oilseed production thrust programme; (iii) scheme for small and marginal farmers and agricultural labourers; (iv) an unspecified 'other schemes of crop husbandry'; (v) fisheries, and (vi) Command Area Development (CADA). Since some of these are thrust areas of the Seventh Plan, it would be useful to look at them specifically.

The special rice production programme in the eastern states is one of the major programme thrusts of the Seventh Plan in agriculture. After being tried out in 1984-85 as a pilot project in 50 blocks at a total cost of Rs 5 crore, it was proposed for the Seventh Plan period in

about 20 per cent of the blocks (430 selected blocks). The cost is shared equally with the concerned state governments. The object is to help improve rice production in the eastern states "by overcoming both short and long-term constraints through intensive training of farmers, motivating them to use better inputs and development of better irrigation and drainage programmes" The central plan expenditure during the first three years was about 12.16, 16.63 and 20.12 crore of rupees; the 1988-89 budget proposed a big rise to Rs 33.85 crore. Apparently, the government and the Planning Commission think this programme has been worthwhile and productive.

The total production performance of rice in the eastern Indian states does not give any firm indications of the impact of this programme during the last three years. In Assam rice production in 1982-83 and 1983-84 was a little over 2.5 m tonnes; in the subsequent years it was 2.4 m tonnes or less, except in 1985-86 when it rose to 2.8 m tonnes. In Bihar a peak was reached in 1984-85, 5.4 m tonnes; in the two subsequent years it was higher, at 6.0 m tonnes. Rice production in Orissa reached a peak of 5.1 m tonnes in 1983-84; after that it has been much lower except in 1985-86 when it was 5.2 m tonnes. In West Bengal rice production reached a peak of 8 m tonnes in 1984-85;

1986-87 shows a marked improvement over it to 8.4 m tonnes. This suggests that significant increases in production had been recorded before the programme came into existence. Therefore, the relative contribution of this specific programme cannot be easily inferred from the later trends. While figures of statewide trend in fertiliser use are not readily available, there was no change in the reported area under HYV paddy, at the all-India level, during 1985-86 and 1986-87, and the increase over 1984-85 was very little. Therefore ground level micro studies alone can throw any light on the effectiveness of this programme in the initial years. However, it is quite possible that this basic extension scheme has helped to stabilise and strengthen whatever the underlying forces that were leading to increase in paddy production in select areas in these states in recent years.

The National Oilseed Development Project is another thrust area scheme where the expense is entirely central. The Oilseed Production Thrust is a new scheme to be introduced from 1988-89. While the first aims at "adoption of a package approach on an area basis in respect of each important oilseed crop in selected states", the components of the second, project "include additional seed production, demonstration, plant protection, supply of gypsum and market

support". While in the first three years of the plan the outlays under the heads was 27.25, 16.5 and 36.4 crore of rupees, the combined outlay under the two heads is proposed to be Rs 52.5 crore in 1988-89. It is difficult to judge the impact of this programme so far. A number of oilseeds are involved. The area and production of soyabean, a new crop, has recorded steady increase over the years and its productivity level has also remained steady. Rape and mustard are the second most important oilseeds in India. While the area under these has shown no increasing trend since 1980-81, the total production has shown some rise in recent years mainly through greater area being under irrigation. Despite this, per acre yield which reached a peak in 1984-85, before the scheme started, has remained below that. It is clear that extension of this crop to irrigated area has been the major development. This being the basic thrust of the programme (promoting oilseeds in "low risk environment by bridging gaps in technology, credit, input and irrigation") the programme through timely supply of seed and other inputs, has possibly enabled people to respond effectively to the ruling high relative prices. The same is the story with regard to groundnut, the major oilseed crop of India. The area under groundnut has not recorded any rise in recent years. Total production and output per hectare reached peaks in 1981-82 which have not

been reached since. The only increase recorded has been in the area under irrigation; nearly 18 per cent of its area is today under irrigation, recording almost doubling of this area over a decade. The crop being largely unirrigated and grown in dry agricultural regions of Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra, the steady extension of irrigation had some stabilising effect on the year to year fluctuation in production, though it cannot counteract widespread drought in major producing regions.

Micro studies into the implementation of the scheme suggest that the scheme has been largely concentrated in irrigation areas, where the beneficiaries are provided with improved seeds and fertilisers. The improved seeds appear to have resulted in some 10 to 15 per cent increase in per hectare yield over the local varieties under irrigated conditions, particularly in summer. But so far as unirrigated groundnut, which is the bulk of groundnut, is concerned, the programme appears to have had little impact.

All this suggests that the increase in groundnut production is crucially dependent on bringing groundnut area in the dry agricultural regions under irrigation. Fortunately, groundnut requires only light irrigation when grown in the kharif and rabi seasons; it is a rather heavy water using crop when grown in summer:



But thanks to the prevailing policies about distribution of water in public irrigation projects in the dry agricultural regions, a large part of irrigated groundnut there is grown in summer. If this water could be restricted to use in rabi season, a proportionately much larger groundnut area could benefit. There is nothing in the present scheme of the government of India and the Planning Commission to lead in this direction. May be, this is

thought to be a state subject.

But the various soil and water conservation schemes, which also feature in the central plans for dry lands, could make a contribution in this direction through suitable development of micro watersheds and seasonal use of the surface flow water

TABLE 1: CENTRAL PLAN OUTLAY ON AGRICULTURE, RURAL DEVELOPMENT AND IRRIGATION, 1985-89  
(In Rs crore)

Sector	1985-86		1986-87		1987-88		1988-89	Seventh Plan Provision
	Budget	Revised Estimate	Budget	Revised Estimate	Budget	Revised Estimate	Budget	
Agriculture	918	859 (4.27)	917	902 (3.82)	912	1157 (4.5)	1078 (3.75)	4057 (4.25)
Rural development	918	1234 (6.14)	1509	1541 (6.52)	1651	1744 (6.79)	1762 (6.14)	4901 (5.13)
Irrigation and flood control	169	138 (0.69)	158	163 (0.69)	167	174 (0.67)	217 (0.76)	835 (0.87)
Sub-total		2231 (11.1)		2606 (11.03)		3075 (11.96)	3057 (10.65)	9793 (10.25)
Total central sector plan outlay	18500	20094 (100)	22300	23625 (100)	25622	25701 (100)	28715 (100)	95534 (100)

Note: The figures in brackets indicate percentages to total central sector plan expenditure.

Source: The budget and revised estimates are taken from the central budget documents for 1986-87, 1987-88 and 1988-89; and the plan figures from the Seventh Five Year Plan. The actual expenditure figures for 1985-86 and 1986-87 were not readily accessible.

impounded in minor reservoirs. But the budget shows no increase in financial allocation for any of the four or five schemes relating to these areas (National Watershed Development Programme for dry land agriculture, dry land farming,

soil and water conservation, National Watershed Development Board, Integrated Soil and Water Conservation Programme). The real resources made available for these purposes have steadily declined from year to year, and the new

budget does not propose any reversion in the trend.

Another scheme for which there is a sharp increase in budgetary provision is schemes for small and marginal farmers and agricultural labourers. The purpose of the scheme, to quote the budget document, is, "To enable small and marginal farmers to obtain needed inputs, fertilisers and improved seeds and also to benefit from minor irrigation and water management and land development". The financial assistance under the scheme is provided through the state government. Therefore, the budgeted sums are exactly spent every year. Compared to the current (1987-88) year's expenditure of Rs 66.95 crore, the 1988-89 budgetary figure is almost double, Rs 128 crore. But it is good to remember that there has been an equally sharp decrease in the past: in 1985-86, the first year of the Seventh Plan, the expenditure under the head was Rs 100 crore but next year it was slashed down to Rs 50 crore, with a slight increase to Rs 66.95 crore in 1987-88. One does not know the reason for these sharp ups and downs. Nor is any information available

on how the money has been used and what benefits flow. In the absence of proper scrutiny and assessment this can go the way of most IRDP loans and subsidies. Whatever the economic benefits, the political benefits of both can be very great indeed.

There are two other schemes on which there is a distinct rise in budgetary provisions: one is called 'other programmes of crop husbandry'. This is a new head introduced this year; so there is no past expenditure under the head. But the provision is quite large, Rs 70.01 crore. All the explanation provided in the budget documents is, "Provision includes contributions to FAO, World Food Programme, etc, and Rs 70 crore for strengthening agricultural programmes". It is not clear how much is for 'strengthening agricultural programmes'; from the way it has been put one gets the impression, Rs 70 crore. What are these? One hopes the parliament will be told about the details and reasons. The other item on which there is an increase is fisheries. The bulk of this is loans to trawler companies.

**TABLE 2: CENTRAL SECTOR PLAN OUTLAY ON AGRICULTURE, ETC, UNDER CERTAIN SPECIFIC SUB-HEADS, 1985-89**  
(In Rs crore)

Sector and Sub-heads (1)	Seventh Plan Provision (2)	1985-86		1986-87		1987-88		1988-89
		Budget (3)	Revised Estimate (4)	Budget (5)	Revised Estimate (6)	Budget (7)	Revised Estimate (8)	Budget (9)
I Agriculture								
1 Agricultural research and education	415.00	75.00	68.86	81.00	76.00	82.00	82.00	95.00
2 Crop husbandry	1305.00	202.12	203.90	207.26	224.66	215.55	253.38	387.22
i) Rice in eastern region		20.00	12.16	23.00	16.63	22.11	20.12	33.85
ii) National oilseeds development programme		30.00	27.25	16.50	16.50	17.50	36.46	17.50
iii) Oilseeds production thrust		-	-	-	-	-	-	35.00
iv) Schemes for small and marg. farmers and agricultural labourers		100.00	100.00	50.00	50.00	66.95	66.95	128.00
v) Dry land farming		14.00	15.76	18.96				
vi) National watershed development programme for. dryland agriculture			54.54	53.54	24.25	27.50	6.35	30.00
vii) Other programmes of crop husbandry								70.01
3 Soil and water conservation	110.00	37.00	36.83	43.81	35.57	36.00	35.65	38.00
4 Animal husbandry and dairying	410.00	95.45	93.27	97.38	85.59	90.00	97.73	85.17
i) Operation Flood		82.00	82.00	74.70	67.83	56.14	69.90	53.57
5 Forestry and wild life	446.71	54.25	52.43	75.00	71.78	91.00	83.42	95.00
i) national watershed development board		11.93	12.65	8.62	9.00	15.93	12.72	14.95
ii) Integrated soil and water conservation programme		12.00	12.00	12.88	10.88	15.39	15.90	12.00
iii) Social Forestry		26.00	24.90	22.45	24.10	23.18	19.58	19.00

(Contd.)

TABLE 2: (CONCLD.)

Sector and Sub-heads	Seventh Plan Provision	1985-86		1986-87		1987-88		1988-89
		Budget	Revised Estimate	Budget	Revised Estimate	Budget	Revised Estimate	Budget
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
II Rural Development								
1 IRDP and related programmes	1864.38	269.05	278.57	378.50	357.43	412.40	383.80	464.56
i) IRDP		226.50	220.97	279.21	280.21	310.00	297.00	346.22
ii) DPAD		37.00	37.00	46.00	35.00	45.50	36.50	51.26
iii) Development of desert area		8.00	16.00	39.00	29.00	39.00	33.55	50.00
2 Rural employment	2994.59	630.00	943.55	1076.30	1151.15	1205.00	1334.90	1259.43
i) NREP	1250.81	230.00	337.21	442.65	466.75	480.00	652.85	529.43
ii) RLEGP	1743.78	400.00	606.34	633.65	684.40	725.00	682.05	730.00
iii) Land reforms	36.71	4.70	3.70	4.05	3.60	5.75	3.55	9.65
III Irrigation and Flood Control	834.93	169.00	138.00	156.98	163.10	167.00	173.80	217.30
i) CADA	500.00	107.00	82.00	89.00	85.20	86.00	89.90	124.90

Note: The data are extracted from the budget papers of the last three years. Only some sub-heads and some items under these are presented here.

Thus, excepting rice programme in eastern states, oilseeds development programmes and provision for small and marginal farmers and landless agricultural labourers, there is no significant increase in any other heads affecting farmers. Provisions for dry land development and soil and water conservation have not received any greater attention. The social forestry programme, started with fanfare three years ago, has been receiving steadily diminishing allocations. Could it be that all these are not found as useful and effective as visualised? If so, why? If not, why the lack of budgetary enthusiasm, and where else is it being compensated? During the last two years, the government of India has spent Rs 74 and Rs 60 crore on crop insurance; even in the very first year, 1985-86, it had spent Rs 16 crore, when

the scheme was just beginning. But the provision for 1988-89 is almost nil (1 lakh rupees only). Is this a manifestation of the growing optimism about the future, or is it to keep budgetary deficits low wherever possible?

Irrigation and flood control are largely state subjects. The only head under which there has been a significant rise proposed in the central plan outlay is CADA: from about Rs 90 crore in 1987-88 to about Rs 125 crore in 1988-89. One hopes even after adjustment for price rise, this will mean a real increase in allocation. Indeed, the trend of expenditure under this head so far suggests that the original plan provision of Rs 500 crore under this head, at 1984-85 prices, would be achieved at current prices by the end of 1989-90; but in real terms, it would be far less than

planned.

The biggest share in the central sector plan for agriculture, etc, is of rural development, mainly IRDP and related programmes, and the Rural Employment Programmes. It accounts for 5.13 per cent of the total central sector plan outlay in the Seventh Plan, while agriculture and irrigation account for 4.25 and 0.87 per cents respectively. Indeed, the Seventh Plan not only did not increase the real allocation for agriculture, etc, in the public sector over the Sixth Plan actuals, but also put a larger share of this into the programmes for direct attacks on poverty, reducing the actual public sector investments in agriculture further. The countrywide debate and discussion on the anti-poverty programme had suggested that since the best efforts at investment in agriculture cannot, in the foreseeable future, reduce rural poverty significantly, it—that is, the best investment efforts in agriculture—should be supplemented by a massive programme of direct attack on poverty by creating greater employment and income for the poor. The Planning Commission, however, instead of making the Rural Development Programme a supplement to agricultural programmes in the public sector, made it a substitute. The government of India in its plan outlays during the four years of the plan, appears to have gone further: while the

plan suggested the share of rural development to be 5.13 per cent, its share in the central plan outlay during the four years has been always more than 6 per cent, for two of these four years more than 6.5 per cent. On the other hand, the share of 'agriculture' has been less than 4 per cent in two of the four years, including in the new budget, while the planned share was 4.25 per cent.

The budget for 1988-89 provides larger funds for IRDP, etc., than the budgeted as well as the revised estimates for 1987-88. But, for Rural Employment Programmes the provision is less than the revised estimates for 1987-88, presumably in anticipation of a better agricultural year. The Department of Rural Development had proposed amalgamation of NREP and RLEGP into a single rural employment generation programme by adopting the Employment Guarantee Scheme approach of Maharashtra at the national level, with much greater resource commitment for the purpose. The ministry preferred to call it a supplement to IRDP; since the National Development Council has approved the plan approach, making IRDP the centre piece of the anti-poverty programme, the department presumably could not say anything otherwise. The minister has announced consideration of these proposals during 1988r89. It is very likely that these considerations will coincide

with the discussions in the Planning Commission about the approach to the Eighth Plan. And it would not be surprising if the final year of the Seventh Plan sees the announcement of a national EGS on a pilot-basis, as prelude to its adoption in the Eighth Plan. There obviously are great political advantages attached to the last year of a plan coinciding with the year of general elections.

IRDP has been provided with a somewhat larger budget for 1988-89 than either the budget or revised estimates for 1987-88. This shows undiminished adherence to IRDP, the findings of the monitoring surveys by the Department of Rural Development notwithstanding. The minimum adjustment, pending full-scale revaluation, that the government could do is to give up fixing annual targets about beneficiaries in the blocks either from the secretariate or in proportion to the regional incidence of rural poverty, both of which are irrational, inasmuch as they do not take into account the feasibility of various schemes in the blocks into account. Instead, it would be preferable to ask each block agency (DRDA) to fix the target for the next year, in consultation with other parties, like banks, etc, involved in it. The government can then hold the block-level agency accountable for the success of its own target. This should impart greater realism and relevance to the project, and

indicate clearly where and under what conditions IRDP can be expected to occupy the centre stage of the anti-poverty programme. While the budget documents do not go into these questions, one hopes the matters will be discussed in the parliament at the appropriate stage.

The related programmes of DPAP and Desert area Development have only marginal increase in budget allocation. But the rather surprising thing is the failure of the government to spend even the budgeted sums, under these heads, as also in most other heads relating to dry land development and soil and water conservation, during 1987-88 which has repeatedly been pronounced as the worst drought year of the country. The works under such scheme are, or should be, mainly labour-intensive works. The failure to fully implement these schemes under the circumstance is difficult to understand. Indeed, different schemes in this field are administered by two different ministries in three different departments, when at the ground level they should be well coordinated and integrated schemes.<sup>3</sup>

#### TAX CONCESSIONS

So much for the central plan expenditure on agriculture and related fields. Turning to concessions provided for inputs, capital and current, in agriculture, one finds that the budget provides for a

larger subsidy on fertiliser account than during 1987-88. This is essentially to cover the cost difference on the basis of retention price for fertilisers and the market price fixed for these. The retention prices are estimated to rise in coming year due to rise in power, transport, etc., costs (many of which were announced by the government before the budget), and possibly on a larger quantum of fertilisers. It does not of course imply any reduction in the prevailing price of fertilisers. The finance minister has advised the industry to give a 7.5 per cent concession on the prevailing price. The fact of the matter is, during the current year (1987-88) the industry, plagued by excess inventories, has been offering about 10 per cent discount on the price, without suffering loss, but in some cases improving the profit level. They surely would not mind changing the label on these discounts to 'On Finance Minister's Advice'.

The finance minister has announced a number of concessions of excise and customs duty on equipment and input used in agriculture. Excise tax on a large number of pesticide intermediates are abolished, and customs duty on a number of pesticides and intermediates are reduced from 105 and 147 per cent to 70 and 60 per cent *ad valorem*. Hopefully this should counteract the simultaneous rise in fuel, power and transport costs, and

any surplus may be passed on to the farmers. It is, however, not clear how elastic is the demand for pesticides to small variations in price, since in many situations availability of necessary spraying equipment, water as well as inadequate marketing channels are greater obstacles.

Excise duty on electric motors used in monoblock and submersible pumpsets for irrigation is proposed to be abolished. Similarly, sprinkler systems, fodder mixers, germination appliances, egg cinders will be freed from excise. Surely, this should make these irrigation equipment cheaper, but whether the farmer will notice it will depend on the extent to which this would counteract the rise in the cost of steel, fuel, power and transport, and finally on whether electricity is available for the purpose, a big 'if' at present. Similarly, the proposed reduction in excise duty on parts and accessories of cold storage plants should help in limiting the rise in cold storage charges of fruits and truck crops, like potato. The reduction in the customs duty on 34 items of food processing and packaging machinery as well as the token reduction in excise duty on jams, jellies, sauces and pickles are unlikely to be reflected in the prices received by the farmers, in view of the present size of

these industries, unless these are farmers' cooperatives. The beneficiaries are likely to be the industries and consumers.

The very limited impact of the above tax concessions on farmers is obvious. However, the finance minister made another policy announcement which is more serious. He announced that the Reserve Bank of India (at the instance of the Government of India) has agreed to reduce the interest rate on short and long-term loans to agriculture by  $1\frac{1}{2}$  to  $2\frac{1}{2}$  per cent, to 10 per cent. This is sure to affect 30 to 40 per cent farmers in the country who borrow from co-operative and commercial banks in a year.<sup>4</sup> And this will be done at no cost to the national exchequer. Who will bear the cost of this reduction? The Reserve Bank of India, NABARD, the commercial banks and the co-operative banks, in that order. The co-operative banks provide more than two-thirds of the short-term farm credit, called crop loans, in the country, and the bulk of this is provided by the RBI through NABARD, at a low rate of interest. Now, this sum will have to be provided by the RBI and NABARD at  $2\frac{1}{2}$  per cent lower interest rate. The same will be the case with term loans advanced by LDBs and commercial banks, a large part of which is refinanced by NABARD which will have to lower its interest rate

appropriately. Any surplus from its interest earning that NABARD gets after meeting its administrative costs, goes largely to increase its total loanable funds. Reduced earnings from this source, particularly in regard to term loan funds, will result in NABARD depending to a greater extent on the government for meeting its increasing needs in the future. And the central government has already shown its intentions by providing for the smallest sum to NABARD in four years in the budget for 1988-89. Nor is the World Bank likely to be very enthusiastic about such a policy to help with more loanable funds.

The most serious impact of this interest rate policy is likely to be on the commercial and co-operative banks. The agricultural loan accounts of most commercial banks are already in the red. If it has not shown up in their overall accounts so far, it is because the agricultural loans, with low interest rates at  $12\frac{1}{2}$  per cent constitute hardly 15 per cent of their total lendings, and the higher earnings from other loans cover up the loss on agricultural account. The lower interest rate at 10 per cent will make their already bad conditions worse, particularly when NABARD does not refinance the larger part of their agricultural loans. At this rate it will not be long before nationalised commercial banks' accounts



go into red, unless they restrict their agricultural lending under one pretext or the other, despite government pressure. The situation of co-operative banks would be worse. As it is, because of the stipulated low interest rates on agricultural lendings and high interest on deposits (higher than paid by commercial banks) the co-operative banks have been reluctant to lend to agriculture from their own funds, but depend on refinance by NABARD. RBI and NABARD, on their part, have pressurised these banks to provide at least a minimum stipulated part of their loans from their own funds. With this  $2\frac{1}{2}$  per cent reduction in lending rates, they are very likely to cave under. Already co-operative finance institutions, including those which until the other day were in relatively good financial position, are in bad shape due to growing politicisation of co-operatives. This new policy decision is sure to push these further to the brink.

With such ominous consequence of this interest rate policy for agricultural finance institutions, what were the compulsions for such a policy? Surely, no farmers' organisation, active in different parts of the country in recent years, has demanded this. If farmers have demanded writing off of loans, it is not because of 'high' interest rates, but because the crops have failed due to

failure of rains, or insects and pests, or the prices have crashed. The answer to their problem is not to lower interest rates. In fact, the present institutional interest rates for agriculture are quite low; for certain of these purposes the rate deserves to be raised to the prevailing market rate level.<sup>5</sup> All this is common knowledge not only with financial institutions but with farmers as well. If, despite this, the government has decided upon lowering interest rates, it can lead to only one unavoidable conclusion, that it is a populist counter to farmers' agitations, at no cost to the exchequer! Whereas government policy should help build and sustain, institutions that are meant to serve agriculture, it is doing quite the contrary.

#### SOCIAL SERVICES

Finally, provisions for social service of rural people. The most important of these is provision for rural water supply and sanitation. The budgetary provisions for this have been steadily increased over the successive budgets; but the 12 per cent increase in the 1988-89 budget over the revised estimate for 1987-88 may be absorbed by inflation, leaving the real provision no higher. Similar is the situation regarding the provision for rural family welfare. Provision for rehabilitation of bonded labour is gradually petering out; possibly there are no more rural bonded labourers left. Last

year a new provision of social insurance for landless labourers was introduced on which Rs 15 crore were spent last year and Rs 20 crore are provided for 1988-89. A new scheme of insurance for the poor through the General Insurance Corporation has been announced this year, with provision of Rs 20 crore. One must await the details of the scheme before commenting. However, the best insurance that the government can provide the poor and the landless is insurance against unemployment. Token gestures in the nature of assurance of some monetary help for a limited number of them on the death of the earner can be poor consolation to their families for whom every living day is a struggle against hunger.

### CONCLUSION

It is unfortunate that a factually wrong impression has been conveyed that this year's central budget is a farmer's budget. If anything, the central sector plan allocations for agriculture, irrigation and rural development are lower for 1988-89 than was the case in 1987-88. Certainly the finance minister has made somewhat larger budgetary provisions for improvement of rice production in eastern India, improvement in oilseed production, help to small and marginal farmers, and on Command Area

Development, that may help a certain body of farmers in a limited way. On all other accounts the real budgetary provision is less than in the past. The tax concessions are confined to very limited number of potential beneficiaries. On the contrary, the interest rate policy which is meant to provide unsought benefit to a large body of farmers immediately, holds out ominous consequences for financial institutions, and if persisted with, will cost the cultivators dear.

### Notes

1. See the recent volumes of *National Accounts Statistics*, (CSO). Also, N Rath, 'Agricultural Growth Investment and Credit in India', Sir A Ramaswami Mudaliar Memorial Lecture at Kerala University, Trivandrum, August 13-14, 1987, awaiting publication by the University.

2. Rath, *ibid*.

3. There is a small plan provision for land reforms, a large part of which is meant to help states which do not have proper land records to take steps to prepare these, so that tenancy protection and ceiling lands can be effectively implemented. But the shortfall in actual expenditure over budgeted under this head has been stated to be because of failure of concerned states to do precisely this. It is a telling commentary on the seriousness of the concerned state governments about land reforms and one may be excused for thinking that the greatly increased budgetary provision for 1988-89 is to create public impression only.

4. On the basis of Rs 6,000 crore of total institutional credit to agriculture (figure for 1984-85), the concession will be at least Rs 150 crore a year.

5. For a discussion of some of these issues, see Rath, *ibid*.

## A LOST OPPORTUNITY\*

Nilakantha Rath

*The finance minister has announced that the government will implement an employment guarantee scheme in the rural areas of eastern India and the dry agricultural regions. This is a welcome decision, more so because it is a shift away from spreading efforts thinly everywhere. But the budgetary heads remain unchanged and the scheme has still to be spelt out. Much more money would be needed to make a reasonable impact in the regions; but there is no indication that this is being seriously pursued. On the whole, there is little indication in the budget that expenditure and orientation-wise there will be any very significant changes over the situation prevailing in 1989-90.*

THE Central Budget generally attracts attention—indeed creates excitement—mainly on two counts: the proposals of direct and indirect taxation (including changes in administered prices), and the budgetary deficit which is primarily responsible for changes in the general price level. Changes in the pattern of expenditure—Non-plan and plan—rarely attract as much attention. The finance minister of the new central government appears to have received widespread appreciation or at least sympathetic acquiescence on all three counts. This is partly because the new government was seen to be in a difficult financial position inherited from its predecessor. Partly also, this appears to be due to the effort of the finance minister to be all things to all (or almost all) men, despite the very wide ranging indirect tax measures and revised administered prices (including those for railway services).

The first important aspect of the budget is the deficit that will ultimately have to be met by borrowing from the Reserve Bank of India. The sum of Rs 7,206 crore for the year 1990-91 is Rs 106 crore less than what was budgeted for 1989-90, but Rs 444 crore less than the revised estimate for that year. This has been made possible by the very considerable increase in tax receipts estimated, mainly corporation and income taxes, customs duties and Union excise duties, over the revised budget estimates (which show no improvement, but sometimes marginal decline over the budget estimates for 1989-90), and a reduction in estimated subsidies on food and fertilisers, reduction in defence pension payments and no estimates of writing off of loans to public enterprises (which is as high as Rs 588 crore in the revised estimates for 1989-90). There is also a lower estimate

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to the tune of about Rs 900 crore as budgetary support for the Central Plan on Capital account.

Two aspects of these estimates cause concern: First, the estimated deficit on revenue account. The total deficit on revenue account is estimated at a little over Rs 13,000 crore; this implies that the government is borrowing (on capital account) to finance its day to day administration. This has been a persistent and growing feature of the union budgets throughout the 80s. As budget estimates go, however, the estimated revenue deficit for 1990-91 is the highest (the budget estimate for 1989-90 was Rs 9,312 crore, if one excludes the receipt of Rs 2,300 crore of OCC surplus inappropriately credited to the revenue account). It is true that this estimated revenue deficit is lower than the revised budget deficit estimated for 1989-90 (excluding of course the OCC surplus) by about Rs 1,700 crore. While this is welcome development, one must examine the plausibility of the reductions in certain expenditures budgeted for, which is the second important question relating to the revenue deficits.

The budget estimates show reduced subsidies on account of food and fertilisers. The increase in the revised budget estimates for, 1989-90 on these counts are explained by increased production and

imports as well as increased cost of buffer stock operations, besides arrears payments. But to explain the reduction in 1990-91 by only excluding arrears raises questions about estimated prospects for foodgrains production. If crop prospects in the coming year are very good, it will mean greater use of fertilisers and larger stocking by the FCI, both implying greater subsidies on these counts. If production is not too good, then the subsidy may be smaller, but the prices will rise and the Rs 100 crore provided for dearness allowance would surely be grossly inadequate.

There is no knowing which other public enterprise's loans on capital account may have to be written off next year; but there is no budgetary provision for this. Such writing off has sometimes been suggested as one of the ways to relieve the public enterprises of 'improper' loan burdens, and the government has been doing this from time to time. So, one cannot be sure that this will not be there in the new year.

Besides these, there is a whole range of subsidies—towards interest and other purposes—amounting to more than Rs 1,100 crore (excluding the Rs 1,000 crore for writing off loans to farmers). There is no sign of any reduction in this, but only an increase.

All these subsidies certainly cannot be abolished at a stroke. But one would expect a policy statement about these that would, lay down the lines along which these would be steadily reduced over the years. The budget statement, however, does not give any, such indication.

Instead, the finance minister has added an extra burden of Rs 1,000 crore for 1990-91 towards writing off of loans to farmers. Until the budget speech, the ministerial pronouncements referred to Rs 14,000 crore to be written off. Apparently, this referred to the total outstanding debt of the farm sector with the financial institutions. Thank god, this was not actually done! The announced proposal is as follows: "The [debt] relief will be available to borrowers who have taken loans upto Rs 10,000 from public sector banks and regional rural banks. The relief will cover all overdues as on October 2, 1989 including short-term as well as term loans. There will be no limit on the size of the borrower's landholding. However, wilful defaulters, who in the past did not repay loans despite their capacity to do so, will be excluded... The state governments may also wish to introduce a scheme on the same lines in respect of co-operative banks within their purview. Subject to the constraint of resources, the central government will consider suggestions for helping state governments in implementing a debt

relief scheme on the same pattern in respect of cooperative credit institutions under their control' The statement appears to suggest that this is meant only for farmers. But in reality, as the previous paragraph in the budget speech suggests, it is meant for both farmers and artisans (including weavers). This is quite wide ranging, and the estimated expenditure of Rs 1,000 crore appears very much on the lower side. Unfortunately, no published firm figures of overdues of farmers are available for the years after 1984-85. The data for the end of 1984-85 shows that the total 'overdues' with agriculturists of all the financial institutions—co-operative and commercial, including RRBs—was more than Rs 3,700 crore (both short term and long term). A little less than half of this was the scheduled commercial banks' and the RRBs, and a little more than half of the co-operative credit societies and land development banks. By October 1989 the figure would be anywhere between Rs 4,500 and Rs 5,000 crore. It is not possible to say how much of this overdue was against loans of less than Rs 10,000. But approximately two-thirds of the total overdue was against crop loans and medium-term loans, the overwhelming proportion of which was less than Rs 10,000 each. Even a significant part of the term loans would be of less than Rs 10,000 each. Therefore, it is very likely that a sum of around Rs 4,000 crore would be needed to write off the

overdues of loans of less than Rs 10,000 each. Out of this, a considerably larger amount than Rs 1,000 crore may be around Rs 1,800 crore would be needed to write off the overdues of the commercial banks and the RRBs. The budgetary provision of Rs 1,000 crore would be inadequate (unless the matter is carried over into 1991-92). Furthermore, the task of establishing the total overdue-crop and term loans-of a borrower from different credit institutions would be ticklish and time consuming. The result may be that each bank will be handle its own overdue cases. This would increase the amount to be written off. The overdues of artisans and weavers have to be added to this. All overdues of IRDP loans will also come in this category, though only some of it is treated as agricultural loans. There is no indication of the criteria by which the 'wilful defaulters' will be identified. Pressures on the one hand and corruption on the other may ensue. And finally, while the finance minister's intention is to help the 'poor farmers'. in fact many poor farmers may be left out of the scheme while the better off may reap its advantages. For example, in the dry regions loans for sinking well are always of more than Rs 10,000, and many small and not-so-small farmers would be genuine defaulters because the well yielded little or no water. But they will not be covered by the scheme.

As for the overdues of co-operative financial institutions, the total sum will be possibly more than Rs 2,200 crore. The state governments will run to the centre for help. But the budget makes no provision, for this. It is, therefore, safe to assume that having made the policy announcement, the government of India will have to provide much more money than budgeted for the purpose, adding thereby to the overall deficit. That the entire rural credit institutional structure will be put to unbearable strain, not immediately but in the years to come, should be clear to all. The government could have taken a more careful and considered step where mainly small and marginal farmers as well as most farmers in regions that have experienced repeated droughts during the last 5-6 years would have been helped. The present predicament, with serious short and long-term consequences, is the result of thoughtless populist assurances (remember the figure of Rs 14,000 crore) being taken up in seriousness by a dutiful finance minister.

Besides subsidies, the two items adding substantially to the growth of current account deficits are interest. payment and defence expenditure. Interest payment has become a very large part of the non-plan revenue expenditure. It is not as if the government is not aware of it. But the budget gives no indication of the steps the government proposes to

take to stem the tide. If reducing other non-plan revenue expenditure is one part of it, making the public enterprises pay the interest on investments in them is another. But beyond holding out the possibility of the workers in these enterprises buying some shares in them (which will help government recover a part of the capital cost), there is no indication of any serious thinking about it. The sick mills are costing the exchequer heavy. Since government is keen about workers' participation in management, would it not be desirable to lease out the sick mills to the workers at nominal rent, but with a clear understanding that they shall run it without any budgetary support or subsidy from the government, as is the case of Kamani Tubes? Shares may be sold to the public in profit-making enterprises, so that the government may retire a part of its borrowings. In the absence of any serious policy measures in this matter, it will not be long before the union government is caught in an internal debt trap.

The increase in defence expenditure of Rs 1,250 crore over the revised budget estimate has two aspects: one specific to defence, and another a general point about government expenditure. The revised budget estimate records Rs 2,700 crore higher expenditure than that budgeted for. Out of this about Rs 1,500 crore are towards salaries and allowances, and the rest mainly for equipment. Of the

further increase in defence expenditure of Rs 1,250 crore over the revised estimate, nearly Rs 350 crore is towards salaries and the rest for equipment and stores. In the present situation when war clouds are threatening us in the horizon, it would appear unpatriotic to question defence expenditure. But every one knows that in government, parliament and public, defence expenditure is the most sacred cow. Therefore no one is willing to discipline this expenditure without in any way sacrificing the efficiency of the armed forces. It is high time these expenses are scrutinised in detail in order to bring down wasteful expenditure. It is also necessary to dispose of old equipment and material, which may not only fetch some money, but will also save expense on maintenance and storage. One heard of some tanks being sold some years ago; there is little further evidence of it in the accounts.

As for the rising salary bill, this is a general phenomenon in government. The rising government salary bill implies three things: (a) increasing number of government employees, (b) increasing remuneration of all classes of employees, and (c) increase in the proportion of higher salaried employees in the total government workforce. This year's budget shows that the total salary and allowances (excluding TA) of the civilian employees of the government of India

would increase by 8.6 per cent over the (revised) estimate for year 1989-90. This is partly because there will be an estimated 2 per cent increase in the total number of civilian employees (in 1989-90 there was a 1.97 per cent increase over the preceding year). This means that the average earning per employee is estimated to increase by about 6.5 per cent in this single year. One does not know whether this budgeted increase takes account of possible rise in dearness allowance, and, if so, to what extent. It is possible that little account is taken of rising DA in this; for, the budget states that only a token provision of Rs 100 crore is separately made to cover increased DA, and the ministries have been advised to meet any rising DA expenditure within their budgeted sum by cutting down expenditures and/or staff. One wonders if this will work and has ever worked in the past in the face of inflation. If there is scope for economy in the departments in the context of inflation, then why not do it now in a systematic manner? In fact, public sector employment in administration is steadily rising over the years; one wonders, to what purpose. The other point is the rising average emolument per employee. The 6.5 per cent rise budgeted for 1990-91 appears to be largely a rise in average real emolument. Indeed, this is what is happening in the entire public sector during the last 12 years: a 4 per cent rise in

average real remuneration per employee (i.e., adjusting the monetary figure by the consumer price index). In the face of a 1.7 per cent rise in real per capita national income, one finds that the bulk of the effort of development is to keep public sector employees better provided. It is time the finance minister and government gave serious thought to this matter. Unfortunately, most 'socialist' advocacy in India is for the organised sector employees, public and private!

Thus, the budget gives no clear indication that the huge deficit, both on total and on revenue account, can be contained. A rising deficit can end in a higher rate of inflation than we have experienced in recent years. But what is worse, there is no indication of policy initiatives that will try to correct the unfortunate trend over the last decade.

The finance minister has stated that his government has fulfilled an electoral promise of spending 50 per cent of the Plan funds on rural development, by increasing the share of the rural sector in the budgetary support for the Central Plan from 44 per cent in the budget for 1989-90 to 49 per cent in 1990-91. It is unfortunate that the budget papers do not include a list of the items of plan expenditure with budgetary support, which are considered to be for the rural sector. It is not easy for an outsider to guess. For the same reason,



it is not possible to find out the difference between this percentage in the revised budget for 1989-90 and the budget for 1990-91. For, the total budgetary support for the Central Plan is not only considerably higher in the revised budget for 1989-90 (Rs 18,234 crore) than the budgeted figure (Rs 16,964 crore), but is higher than the amount budgeted for 1990-91 (Rs 17,344 crore). Could it be that the higher percentage had been reached in the revised estimates?

More specifically, the increased expenditure in favour of the rural sector appears to be about Rs 1,000 crore between the two budgets. The bulk of it (Rs 916 crore) is on rural employment schemes (Jawahar Rozgar Yojana), schemes of crop husbandry (Rs 53 crore) particularly national watershed development programmes for rainfed agriculture, co-operation (Rs 83 crore), agricultural research (Rs 35 crore), finance to NABARD (Rs 163 crore), elementary and adult education (Rs 51 crore), integrated child development services (ICDS) (Rs 78 crore), sericultural (Rs 41 crore) and welfare of scheduled castes and tribes (Rs 73 crore). However, the increases over the revised budget for 1989-90 are much smaller, and are mainly for elementary and adult education (Rs 142 crore), ICDS (Rs 78 crore), co-operation (Rs 109 crore), water resources (Rs 34 crore) and a few other

heads for smaller sums. Therefore, except for elementary education and ICDS, there is really no major shift in expenditure on rural development budgeted for 1990-91 over that estimated to be achieved in 1989-90. The finance minister would have given a clearer picture of the change in emphasis if he had compared the budget figure for 1990-91 with the revised budget for 1989-90.

There is no significant increase in the budget for the rural employment schemes. The finance minister has announced that the government will implement an employment guarantee scheme in the rural areas of eastern India and the dry agricultural regions. This is a welcome decision, more so because it is a shift away from spreading efforts thinly everywhere. But the budgetary heads remain unchanged and the scheme has still to be spelt out. Much more money would be needed to make a reasonable impact in the regions; but there is no indication that this is being seriously pursued. On the whole, there is little chance that expenditure and orientation-wise there will be any very significant change over the situation prevailing in 1989-90.

Finally, turning to the proposals for raising revenue through taxation, the finance minister has again tried to keep up the populist demands and promises by

giving concessions to income tax payers at the lower income levels. When with a highly inequitable pattern of income distribution, one needed widening of the tax base, and making the organised sector pay at least a small part of their rising real income for the benefit of deprived segments, the budget appears to put them on par with "poor farmers, artisans and the landless"! Unfortunately, organised political and trade union opinion is for more benefits to the organised sectors: notice the dissatisfaction expressed by both the BJP and the CITU about the 'inadequate' income tax concessions.

Taxing petroleum was unavoidable. But with the incomes of the organised sector going up in the manner noted above, it is not surprising that the demand for scooters and automobiles is rising, and marginal price rises simply cannot adequately upset the income effects. It is time the finance minister and the government tried to tackle it at the root.

The amended Section 80C is a welcome step; it prevents undue advantage to savers under these heads in the high income categories. At the same time, it gives some additional tax benefits to people in the lower range of the tax ladder! They would be persuaded to put a larger part of their savings into the government coffers covered under this section of the Income Tax Act.

The higher income categories have not been given any concessions except for the advantage flowing from the higher exemption level and the expanded slabs; the modified Section 80C reduces their tax concessions. The surcharge for special employment schemes is continued for these income categories, though the base income level for payment of the surcharge has been raised. But, simultaneously, the reduced-corporation tax rate (compensating for the abolition of investment allowances) has been widely welcomed as is evident from the stock market reaction. The finance minister appears to have something for everyone: the farmers, the urban middle class and the upper class!

The wide range of commodity taxes coupled with the upward revision of railway rates and fares are sure to have an upward pressure on prices. And, despite the finance minister's hope and directive, government expenditure will go up, adding to the deficit and the inflationary pressure. How one wishes that a sincere and well-meaning finance minister with widespread goodwill had resisted populist temptations, thereby reducing deficits and the risk of inflationary pressure, and started to give a lead to changes in the pattern of expenditure and policies on many fronts.

## HIGHER EDUCATION: PLEA FOR REORGANISATION\*

Nilakantha Rath

*In the 25 years that have elapsed since the 1966 report of the Education Commission of India many of its recommendations have been tried out but the quality of higher education has not registered any improvement. This paper examines the system of education in practice in India and suggests measures towards a reorganisation of undergraduate and post graduate education so as to ensure both responsibility and accountability.*

TWENTY-FIVE years ago, the Education Commission of India began its report by saying "The destiny of India is now being shaped in her class-rooms". This was a time when 70 per cent of India's population was illiterate and two-thirds of the population in the working age-group of 15 to 44 were illiterate. Nearly 65 per cent of the children in the relevant age-group were formally enrolled in lower primary schools, about 25 per cent in the higher primary schools and about 13 per cent in the secondary schools. Higher educational institutions, namely, intermediate, diploma and degree colleges as well as universities were a little over 4,000 in number, where nearly 20 lakh students were enrolled in a year. The commission noted that the salaries of teachers not only were low at all levels, but had not registered any increase in real terms since 1950-51. The content of education at every level was considered much lower than what was desirable and there was widespread feeling that it was becoming

poorer, particularly at the post-high school levels. This was the state of the 'class-room' where the commission thought the destiny of India was being shaped.

The commission made wide ranging recommendations on all aspects of the Indian educational system. Following its recommendations and policies adopted by the union and state governments, there has been very considerable quantitative expansion in the 'class-room' facility and enrolment. The share of expenditure on education in the net national product has nearly doubled. Large sums of money are being spent on adult education. Nearly, 96 per cent of children in the relevant age-group are enrolled in primary schools. The number of students enrolled in higher primary (or middle) schools and high schools, as percentages of the population of children in the relevant age-groups have increased to 53 and 25 respectively. The number of postsecondary level diploma and degree

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level colleges and universities has increased to more than 9,000. The number of students enrolled in them has increased 2.5 fold. The average salaries of post-secondary and university teachers, in real terms, increased at an average annual compound rate of 2.5 per cent and 3.1 per cent between 1967 and 1980-81. If data for the years of the 80s were available they would, I presume, reveal higher rates of growth at the college and university levels. India today boasts of possessing the fourth largest technical manpower in the world. At the higher technical level there appears to be a large exportable surplus: the bulk of the IIT graduates go abroad to work in the developed economies of the west. Many more graduates come out of our universities than can land a job within a year or two.

The quantitative achievements, though short of the Education Commission's estimated targets on many fronts, do not highlight serious lacunae and deterioration in the quality of the product. We have to wait for this year's census to assess the impact of the adult education campaign of the last decade. But one thing should be clear: The emphasis in the campaign has been to impart to the illiterate adult basic acquaintance with the three R's particularly writing and reading. It should be common knowledge that it is much more difficult to teach an

adult to write the script than to merely read it. The task will be not only very time consuming, but at a reasonable interval of time one is likely to discover the new literate being able to do not more than sign, with shaky hand, his or her name. The basic purpose of adult education is to make literature like 'purana', stories and newspaper accessible to him/her, as well as convey information about many things, like state policies and production methods, all of which depend upon the adult's ability to read the printed word. But our endeavour is to do the 'best' by the illiterate adult, without realising that in such situations the 'best' may be the enemy of the 'good'.

Universalisation of primary education is still unattained. What is more, the high percentage of enrolment of children in the appropriate age-group (95 per cent) hides a bleaker real situation. Many schools have no blackboard, only one teacher despite large number of students enrolled, not even a single room, no drinking water, etc. In tribal areas in particular, many primary schools exist only in name; the teacher draws not only a monthly salary but also the quantum of CARE food for the school children without visiting the school even for one day in the year. The drop-out rate from the primary school is of the order of 50 per cent. The number of schools, teachers and pupils at the middle and secondary

levels has grown at an even faster rate-at 4 to 6 per cent a year. But the goal of universal education to children up to the age of 14 is still a far cry, with almost half the children in the age-group 12-14 not even being enrolled in the middle schools. The drop-out rate is more than 65 per cent.

The quality of teaching and learning at the high school level has come down. At the higher secondary level the goal of diversification of education with a view to directing a larger body of students to various professional or applied fields has not succeeded.

It is higher education that has registered the highest growth during the last quarter century. The number of pupils grew at 7 per cent a year and the number of colleges at 6 per cent a year. The teachers' average real remuneration grew at more than 3 per cent a year. The share of higher education in the total governmental expenditure on education has increased by 15 per cent. But there is great dissatisfaction with the quality of higher education provided in the country. I, therefore, propose to examine the state of higher education in the country and plead for certain lines of reform.

Writing in 1966 the Education Commission observed, "There is general feeling in India that the situation in higher

education is unsatisfactory and even alarming in some ways, that the average standards have been failing and that rapid expansion has resulted in lowering quality. The examination results, the reports of Public Service Commissions, the views of employers and the assessment of teachers themselves, the results of research done-all seem to support this conclusion ... Many of our educationists and public men, however, have not fully realised how serious are the actual conditions, academic and physical, that obtain in the colleges and universities. Even those who are broadly aware of the situation, fail to notice its poignancy because they have become used to such conditions".

The commission, therefore, went on to describe the conditions briefly. "The existing situation in higher education during the academic year broadly alternates between slackness and strain-slackness during the session and strain at the time of examination. In many of the weaker colleges and universities a majority of teachers teach mechanically and listlessly. The subjects in which they teach do not often involve their intellectual passion. They do not usually have a part in the formulation of the syllabus which they are required to teach, nor do they make-with a few bright exceptions-experiments in methods of teaching. There is little enthusiasm for

learning or discovery of new truths because research is not considered an integral part of their duties and whatever research is done is usually of unconvincing quality. In the absence of a research impregnated atmosphere, even the intellectually ambitious younger members of the staff are seen caught up in the general atmosphere of indifference or cynicism. A large proportion of teachers suffer from financial worries—particularly in colleges where grades are low—and are often unable to buy books and journals. Even the physical conditions of work discourage serious, undistracted study or intellectual dialogue with their colleagues... The hierarchical concentration of authority within the departments and colleges, the atmosphere of distrust between senior and junior teachers, the cynicism about administrative authorities, the unseemly conflict about offices and positions and the attitude of envy towards persons of superior attainment—all have contributed to the deadening of the spirit of intellectual curiosity and adventure."

"The situation with regard to the students" the report said, "is no better. Many now come from comparatively or entirely uneducated homes and are ill-prepared at the secondary level to undertake genuine university work; they have little experience of independent study; their curiosity is unquestioned and learning for them is

mainly a matter of mechanical memorisation. Here is, as a rule, little discussion of intellectual matters with their teachers or fellow students; their main duty is considered to be to attend uninteresting lectures usually given in a language which they understand inadequately. When the medium is an Indian language, there is dearth of suitable textbooks and supplementary literature necessary to achieve competence in their subject. Many of them cannot be expected to read textbooks in English because it has not become for them the language of the library. The capacities of the better students are not fully stretched by curricular offerings, or the stimulus which inspiring teachers could provide". After describing the then prevailing state of higher education in India in such depressing terms, the commission wrote, "This may appear an exaggerated picture. But it is not".

The commission recommended a number of steps to improve the situation. In the first place, it advocated the setting up of five or six 'major' universities, which will not only concentrate the scarce human resources in the country in the different departments, but also, attract the best students from all over the country, who after passing out, will graduate from the other university and colleges. About 50 centres of advanced study should be opened in other select universities 'partly as a preparation and partly

as a consequence of these major universities.' The departments in other universities should be gradually selectively strengthened so that after some years they too will come to the level of the advanced centres.

The affiliated colleges should be graded on the basis of a set of criteria like number and quality of staff and students, research output, library and laboratory facilities, performance of graduates of the college in national scholarship examinations, innovations in teaching procedures and examination results. Persistence of colleges, placed in higher ranks, in their performance over years should attract advantages like salary bonuses, extra resources for libraries and laboratories, etc. Finally, under every university, certain outstanding colleges (or a cluster of good colleges) with ability to improve themselves markedly should be granted 'autonomous' status, involving powers to frame their own courses of study, rules of admission and conduct their own examinations.

The commission advocated greater flexibility in the framing of courses and their choice by students. Indeed, it did not favour rigidly defined courses at the post-graduate level, but desired that it should be left to the teachers to design their own courses and teach them. It wished to discourage single year-end

examination, and advocated continuous assessment during the working sessions, through frequent tests, tutorial work, discussion groups and seminars, etc. It advocated internal assessment of the student by his teacher, and a parallel external assessment.

While the commission recognised the necessity of use of the regional language as the medium of instruction at the undergraduate level, it visualised the use of English at the post-graduate level for many more years. In any event, it advocated adequate competence of students in colleges and universities in English as a 'library language'. For this purpose, it proposed special training in English language to students at the college level to help them overcome any handicaps arising out of their differing school backgrounds.

And, finally, the commission advocated increased salaries to teachers in colleges and universities, in order to attract able people and give them financial strength to pursue their academic interests.

During the last quarter century since the commission reported to the government, many of its recommendations have been tried out. The scheme for the major universities was not put to practice, though most other recommendations

were carried out. The college and university teachers' salaries have registered a steady, and by Indian standards a fairly high rate of growth.

But in all matters relating to the quality of higher education, there has been little change in the situation, if anything, for the worse. The union government's document on the state of education in India in 1986 described the situation in higher education in terms similar to those used by the commission 20 years before.

The two years of higher secondary education that were to be integrated with the secondary school system are still with the colleges in many states, where the preferred nomenclature for them is junior college. It was expected that the bulk of the pupils in the higher secondary stage would be directed and helped into various types of professional education and training. In fact, the bulk of them get into general education courses, largely in social sciences and humanities. Even in these as well as in science courses, the content is often ill-conceived, trying to capsule into a short frame what a student is normally expected to learn in the undergraduate class. No wonder, there is neither provision for good grounding nor direction in such teaching.

The three years of undergraduate class are the weakest links in the chain of higher education in India. Most universities are affiliating universities, with more than 100 colleges, often more than 200 colleges under them. The courses of study in any subject are common to all colleges under the university. These courses are prepared by a board of studies consisting of about one and half dozen members, most of whom are *elected* from amongst the teachers of the subject in the affiliated colleges. The Education Commission had moaned the lot of the teachers who have no hand in the framing of the courses of study they were to teach in the class. Thanks to the very large numbers of colleges, and teachers in the subject, there is not a ghost of a chance that most teachers will, in the existing structure, ever be associated in the drafting of the courses of study. The boards of study generally tend to play safe in the matter by narrowing the required contents of the course as far as possible, lest their constituents find it difficult to teach in the class (though the excuse is always in terms of the 'ability of the students to understand and learn it').

Brevity is the distinguishing mark in the draft of a course of studies. It naturally leaves scope for different interpretations



about the intended coverage of the subject. Therefore, the safest tendency is to minimise the coverage, which is universally appreciated.

The course of study are accompanied by a list of required and recommended books for study. But, by common consent, a single textbook, often prepared by a teacher keeping the syllabus in view, is the real effective reading matter. Some senior teachers, with experience in drafting syllabi, teaching and conducting examinations, will assure you that the university's recommended list of books is essentially a matter of window-dressing. Where teaching and examination are carried out in the medium of the regional language, there are usually one or two textbooks, which often appear to serve the purpose of the student for all the five years of undergraduate and post-graduate classes. Often teachers resort to dictating notes. Most students prefer that since the questions in the examination are such as can be conveniently answered with the help of these notes. There are many guide books published and available which help the student precisely in this task. Good textbooks, which help the student in self-learning and continuous self-assessment of his understanding are pushed out of the market. A sort of Gresham's Law operates in the textbook market.

This happens mainly because the questions set in the final examination have become the *de facto* syllabus in the subject. The tradition of looking into the past question papers in order to prepare for the examination in a subject continues, for it is the student's experience that it pays dividends. In many subjects, the past five to six years' question papers will reveal no more than three dozen questions in all, which makes it possible and convenient for guide book writers to prepare capsuled answers to them. And, saddest of all, many teachers take their cue from such guide books while assessing the answers in the examination. It is not uncommon to come across instances where students taught by a competent and sincere teacher fare poorly in the examination for giving the right answers, since the examiner is guided by the wrong answers in the guide books.

Following the recommendations of the Education Commission, the UGC tried to persuade universities to have weekly tests and assessments by the teacher during the term in addition to the final term and examination. The internal assessment was to receive due weightage in the final marks or grade of the student. Secondly, the UGC advocated preparation of question banks on every course, from which at least half the questions in the final examination are to be drawn. Some universities failed to implement

these suggested measures. Of the others who did, most have in effect given them up.

The idea of a question bank was primarily as an aid to students in their study. As they learn they can and should on a regular and continuing basis try to answer the relevant questions in the question bank to ensure that they have learnt the matter correctly. If questions, not only in the regular internal tests but in the final examination, come from such question banks, that would only ensure the student's thorough preparation in the subject. Indeed, if the questions in the bank were properly prepared, covering all aspects of the subject and testing not only correct knowledge but also problem solving ability, and these were being revised periodically, the task of setting question paper in the examination would have been easier. These could have been drawn at random from the question bank, right at the time of the examination, making the whole problem of leakage of the question paper irrelevant. But, for the device of question bank to serve its purpose, each course should have had at least two to three hundred questions. The UGC, however, discovered that in most universities in most courses the questions in the bank were only about 30 or 40 at the most. No wonder, the experiment

failed; these banks made the task of preparing answer banks to these limited questions by the guide writers easy.

The internal assessment by the teacher also did not appear to work. The teachers played 'safe' in grading their students. Their teaching burden was often heavy, resulting in neglect of written tests. Setting meaningful test papers and assignments was not always easy; where detailed question banks \*were available, teachers often hesitated using them since they themselves were uncertain about the answers. A more conscientious teacher or department, under such circumstances, felt isolated and discouraged. Finally, there was the pressure from students and the managements for fairly high marks or grade in the internal assessment to enable a student to at least get through in the overall assessment. The Education Commission had suggested correlation of the internal and external assessments for every course in every college, in order to facilitate classification of colleges. Though the classification of colleges never took place, the correlation analysis attempted in some universities showed that while in a few teaching departments or subjects handled by individual teachers the correlation was fairly high (perfect correlation should not be expected), in regard to most colleges not only were the internal marks or grades at a much higher level than the external examination

marks, but also the correlation among them was poor, the relative marks or grades differing erratically. The basic reason for this was the tendency of the teacher to play safe.

The external examination is being held in the traditional style. A few out of a few hundred college teachers in the subject are appointed to set the question paper and a larger number to assess the answer books. Here again, the question setter plays safe, since no one is sure how a subject is in point of fact handled in every college. Therefore, there is great unwillingness to leave the beaten track, i.e., the conventional questions. And the assessor sees to it that the marks range between a little lower than minimum pass mark and a little higher than the first class mark, except where the student has failed to answer the required number of questions. The questions, except in mathematical subjects, are such that it would be difficult to give a zero or very high or full marks to an answer. In any case, if most marks are within the range of passing marks, there is the least fear of complaint from the students.

Thus, the total system of setting the syllabus, teaching, drawing question papers and examining answer scripts is impersonal where it is not possible to fix responsibility at any stage. For everything the only responsible body is the

university. This is a situation that appears to suit most teachers and colleges. In one university it was proposed by the vice-chancellor that since internal assessment had as high a weightage as 40 per cent in the final marks or grade of the students the degree certificates should carry the name of the college where the student studied in bold letters along with the name of the university so that the teaching institution could be identified and credited. The proposal was almost universally opposed by the college principals and teachers. There is a strong reluctance, possibly fear, to be identified or to acknowledge responsibility formally and publicly.

This also appears to be one of the reasons for the slow progress of the scheme of recognition of autonomous colleges under the universities. Certain state governments have been reluctant to accept the idea under the feeling that this promotes elitism in the field of higher education. This opposition to any form of elitism is strange; for higher education in itself is elitist. Higher education, unlike primary or even secondary, cannot be a matter of fundamental right of everybody; selectivity is ingrained in it. But the opposition of the teaching community to the idea of autonomous colleges is another reason for its slow progress. The reason is similar to that for the opposition

to the identification of the name of the college in the degree certificate of the student.

The present state of undergraduate education in the country is thus pathetic. The entire structure is such that what it seeks is at best the highest common factor. The more able, serious and innovative teacher or department or college is smothered in such a system, and fails to make its impact. The more sensitive undergraduates have been heard to remark to their friends: 'these three years in the college have been utter waste'. The Science Advisor) Council to the prime minister has stated that "the universities turn out a large number of graduates many of whom end up by being unemployed or underemployed, being perhaps even unemployables." The universities, contrary to the expectations of the Education Commission, have failed to improve standards but if anything, have themselves been dragged down.

It is high time we realised that changing vice-chancellors or giving higher salaries all round cannot improve the situation. The enormous change in quantity has made a change in quality that simply cannot be prevented in the existing system. The performance and possibilities of colleges when the universities had hardly a dozen of these affiliated, simply cannot be ensured,

much less improved upon in the situation of massive numbers. Even lord Jagannath as vice-chancellor cannot improve the situation.

The entire structure of higher education calls for a change. It must begin with putting the responsibility squarely where it belongs, namely, the college and its teaches. What is required is not selective autonomy, but universal and compulsory autonomy. Every affiliated college should be autonomous in its academic work: the college, i.e., its departments should prepare the courses of study to be offered to the students in the undergraduate classes, do the teaching and design and arrange for the assessment of the students. No common courses or syllabi and no common examination should be prescribed or imposed by the university. Each college should have its own method of selecting pupils for admission, as long as it is on merit, decided by any special examination and interview besides the total background of the student. Indeed, the entrance test should be at least as stiff as the exit test, in order that only students with the necessary background and competence to benefit from the types of courses offered by the college are admitted, thereby minimising the frustrations due to failures.

The role of the university shall be to award degrees to the successful candidates from these autonomous colleges in a common convocation, with the degree certificate carrying the name of the autonomous college prominently on it. Besides, the university shall have two other roles with regard to the autonomous colleges: provide for a board of studies, and assess the college teachers and teaching departments periodically. The board of studies on each subject set up by the university should be essentially a consultative or advisory body to the affiliated college, where the proposed courses can be discussed and suggestions made. Ultimately the final decision must lie with the college.

The university, instead of assessing the students, should assess the teachers in the affiliated colleges periodically, once in say four, five or six years. Naturally, the assessment shall be subjectwise, of the individual teachers as well as the department as a whole. This will cover all aspects of the teachers' and the departments' work: design of course, the method of teaching, of assessment, including examination of past examination papers. The students' anonymous assessment of each teacher every year should also form a part of the university's assessment. The assessing committee of the university should be free to make suggestions for improvement, if any.

Where severe strictures are passed, there should be an early review to see if improvements have taken place. Failure of the college or a particular department or a teacher to improve should result in the withdrawal of affiliation of the particular college or department or recognition of the individual teacher by the university. Except for these three aspects, every affiliated institution shall be completely autonomous.

Autonomy to the colleges would immediately raise the spectre of unequal standards, reckless grading or grading under student or local pressure and therefore utter mess in the field of higher education. It is very likely that soon after the conversion of all affiliated colleges, small and big, rural or urban, into autonomous colleges, the situation will take what appears as an ugly turn. After all, there is the experience with the internal assessment in the colleges to guide us about the result of complete autonomy. But this need not worry us unduly. Every one recognises that today a BA, BSc or BCom degree of an university, even in the same class or grade, does not mean the same with all successful candidates. With autonomy, this hidden difference will tend to become open. The market for graduates will almost immediately recognise the great diversity in the same BA degree. It would, therefore, begin to check and

choose. Indeed, at present there are few jobs for which the recruiting organisations select candidates on the basis of their university degree or marks; they conduct special tests to select employees. Even the job of a college teacher which until the other day was one of the few that did not require such test, will now no longer be such, thanks to the UGC's decision to prepare an approved panel of candidates, countrywide, for such posts on the basis of a written test. The university degree provides such recruiting organisations only with a basis for a first round of eliminations. With college autonomy, these organisations will also learn, sooner than later, where to draw the line for products of different colleges. The post-graduate teaching institutions shall have to conduct their own admission tests, instead of depending on the university (i.e., autonomous college) grades.

Surely, the levels of degrees from different colleges in different subjects will not be the same. But even in the best of times there is no reason why they should be. Different colleges may design their recruitment, courses and assessment to suit different requirements in the society. This is precisely what is absent in the present day college situation. Students with different interests and abilities will tend to gravitate to different colleges apparently catering to their needs. The UGC had persuaded some universities to

permit interested colleges to design special courses from a wide field for interested students, in conducting which the colleges were to be completely autonomous. But these were supplementary to a set of standard university prescribed courses. Therefore, design of teaching, workload of students and teachers, and assessment could not be properly done. The colleges need complete freedom to experiment with such teaching programmes. As time passes autonomous colleges will learn to take up the challenge.

Nothing should prevent any group of autonomous colleges from getting together on a voluntary basis to prepare common courses of study or hold common examination. Indeed, in the beginning many colleges may tend to do this. But gradually the more enterprising and innovative ones will formulate their own schemes. An important merit of the autonomy scheme is to enable those colleges, subject departments and even teachers, who feel smothered and even suppressed in the present scheme of things, to come out and stake their reputation in the academic field. Gradually others will follow.

Before turning to the question of finance, it is necessary to discuss briefly the question of medium of higher education. The Education Commission,

while recognising the appropriateness of the mother tongue as the medium of instruction, had emphasised the importance of English as the library language in higher education. This has fallen by the roadside. That many students coming to colleges and universities cannot write correctly in English or speak it need not be a matter of concern. But what should be a matter of serious concern is their inability to freely read relevant literature in English and understand lectures or discussion in it. The slogan 'Angrezi hatao' has been taken to mean refusal to read anything written in that language unless it is translated into the mother tongue. It has cost higher education in India heavy. Any one admitted to a college or any institution of higher learning must be able to freely read and understand literature on the subject in English. Indeed, this should be a necessary requirement for admission. This should not be taken to mean that every student passing out of the high school should have studied English as a language. In fact, there is no justification in insisting on making English a compulsory subject for the secondary school certificate. English can remain as an optional subject. Those who might have passed secondary school examination without English, should have the facility to learn the language in special classes to qualify for admission to the college. The level of competence in English should be such

that after admission to the college the student should not find reading books or articles in English difficult, and, therefore, avoid it.

Complete autonomy to colleges raises the question of financing of college education. Today except for the fees paid by the students and a small amount of endowment fund and other sources of receipts of the colleges, the overwhelming proportion of the current expenditure is met by the state and central governments and local authorities. There is no reason why all these institutions, irrespective of their strength and quality should be supported from public funds. This of course does not mean that the state should provide no funds for higher education. Indeed, the better way for providing funds for higher education is to make widespread provision for scholarships and loans to students admitted to different educational institutions. The institutions should charge full fees and the student can choose the institution of his preference. But, in the first place, such sharp and sudden change can create great dislocation and confusion. Moreover, the government may like to keep an eye on the way the institutions are likely to raise and use their resources. For this purpose, it is advantageous if the government meets a part of the costs.

Therefore, to start with, the government should freeze its total monetary grant to the colleges with further stipulation that no more than half the grant can be used for the salary of teachers, about 25 per cent for library and laboratory purchases, and the remaining for other expenses. The st should also notify the colleges that over the next 10 years the real value of the total state grant shall be steadily reduced to a lee where the average salary payable to a teacher from the state funds shall be equal to the median salary of a secondary teacher. The colleges, in turn, shall be permitted to charge differential fees for different subjects, a part of which (say, about half) can be used to pay salary (supplementary) to the teachers, and the rest for library, laboratory and other purposes, in fixed proportions. Most important of all, the teachers' salaries shall be variable and negotiable. Since tuition fees can vary subjectwise, the subject department can advise the college about the appropriate fee, and the supplementary salary of the teachers in a department shall be apportioned on the basis of number of periods engaged and number of students taught.

No teacher should be given a tenure, (i.e., permanent) appointment unless he has put in at least seven years as a teacher. Reviewing the work of a teacher is not easy at the end of a year or two, which is the present probation period. At least one

review by the University Committee of the teacher's work and the time given to improve performance must elapse before confirmation in service. Of course, a college should be free to terminate the service of a confirmed teacher if the whole college or the entire department has to be closed.

Since the colleges will be free to charge fees of their choice and will be academically autonomous, the students will have freedom to choose a college of their preference, subject of course to their satisfying the admission requirements. The state must come forward to meet the increasing cost of education for the student by setting aside funds for scholarships and loans to students for the purpose. The loans should be repayable over fairly long periods after completion of the degree. It is through this mechanism of scholarships and loans that the state can also promote its policies in regard to manpower requirements in various lines, and help to students from socially and economically handicapped families. The state can fix the proportion of total funds to be paid and the number of students in the latter category to be helped, from time to time.

Such an altered approach to the organisation of higher education would result in greater variation in the quality of colleges, as well as in salaries of teachers



and fees of students. It does not necessarily follow that the number of students seeking admission would come down. It is possible that colleges with very little strength will find it necessary to close down. But this will not happen before the management makes a determined effort to expand the strength. If the government puts a limit every year to the number of students to be provided with loans and scholarships, in view of the estimated manpower requirements, some students may be forced to fall back entirely on their own resources, or go without admission to a college. But this need not prevent them entirely from higher education. The Open University system, introduced in India some years ago, provides opportunity for students seeking higher educational qualification at an easier pace and lesser cost. Indeed, some colleges and college teachers might find it financially more rewarding to convert themselves into private tutorial colleges and teachers preparing students for the Open University degree. Many sections of our society have been traditionally kept out of any education. In the new social environment, they are demanding and will continue to demand access to all fields of education. It will be well-nigh impossible to restrict or control this. While the abler amongst these will get scholarships and loans to seek admissions to full-time higher educational institutions, with at least a minimum quota fixed for them, the

rest shall not be denied the facility of higher education due to the facility of the Open University.

The type of reorganisation of undergraduate college education discussed above should also apply to post-graduate education in the universities as well as in various institutions teaching and training students in professions like medicine, engineering, architecture, etc. The post-graduate departments of universities should have complete academic autonomy. The fees can be different for different departments. Salaries of teachers, provided partly from state grants and partly from fees, will be negotiable to start with and thereafter would depend on the workload of the teacher measured in terms of number of classes taken and number of students taught. Funds for research have to be claimed by individual teacher on the basis of specific research projects submitted to different public and private agencies with funds for the purpose. The research funds thus provided can include remuneration to researcher on mutually agreed terms. The total emolument of a teacher-researcher will thus come from three sources, depending upon his time allocation as well as the quality of his output.

Such a reorganised system of higher education would fix responsibility and

provide accountability; these are conspicuous by their absence in the present situation. It would provide incentives to different institutions to try to become institutions of excellence in their chosen fields, while the present system smothers all initiative in the direction. The institutions can cater to a wide variety of needs, when at present an undifferentiated mass product not tailored to any particular need is causing frustration all round. And, both teachers and students, required to earn their salaries, and bear the costs of education, would be more careful and diligent. No one realises the value of anything that is given free (or near free). At primary school level, or even at a stretch at the high school level, the pupil is too young to appreciate its worth. So the society must provide it free or near free, recognising its worth in making the pupil's

later life happier and his activities more productive. That logic, however, does not apply to higher education, in which there can be no free lunch. It is high time our material and human resources in higher education are used more productively. But that can happen only when the direct beneficiaries are made to realise the cost of it. Indiscipline thrives in an atmosphere of irresponsible and nearly costless education. A change in the structure should destroy its main base. It is time institutions of higher learning in India get down to their proper task as their name implies.

[Founders Day Address at the L M Mishra Institute of Economic Development and Social Change, Patna in February 1991.]

## **MAKING THE ECONOMIC TRANSITION SMOOTH: BETTER LATE THAN...\***

Nilakantha Rath

*The disastrous foreign exchange situation at the beginning of the nineties led to the government of the day setting out on the road to liberalisation, privatisation and globalisation. Many of the problems the economy has been facing since have arisen from the unthought-out consequences of this turnaround without putting in place the necessary policies and institutions not only to make the transition smooth but also to provide the instruments for preventing or checking the undesirable consequences of unbridled freedom in the economic field.*

At the time of formulation of the Second Five-Year Plan, leading Indian economists, at least most of them, persuaded the profession and the government about the need and propriety of a centrally planned economy in which the state would not only be in control of the commanding heights but also lay down the limits for the operation of the private sector in trade, industry, finance, and in certain major aspects of agriculture. Thereafter, till the end of the 1980s Indian economists, sometimes in collaboration with some kindred foreign scholars, devoted their major attention to fine tuning the central planning methods. In retrospect, I think we as a group never gave ourselves the opportunity and the task of reviewing the approach from the point of view of its efficiency from time to time. Even the relaxation in the field of imports in the middle of the eighties was not considered along with all other relevant sectors and aspects. The collapse of the centrally planned economies in Europe caught us unawares; and the disastrous foreign exchange situation of India at the beginning of the nineties led to the government of the day abandoning the 45 year old approach and setting out on the road to liberalisation, privatisation and globalisation, without much of a murmur from the bulk of economists in the country. Many of the consequent problems the economy has been facing since, appear to have arisen from the unthoughtout consequences of such a turnaround, without putting in place the necessary policies and institutions not only to make the transition smooth but also to provide the instruments for preventing or checking the undesirable consequences of unbridled freedom in the economic field. I imagine, again in retrospect, that had we examined our basic approach and policies from time to time with at least the same seriousness as that with which the panel of economists

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of the Planning Commission examined the matter in the middle of the fifties, we would have found it necessary to relax many of the restrictions in an organised manner and put up institutions and rules to monitor and discipline the freed sectors, in the interest of growth as well as equity. The result would have been a smooth and systematic transition. While admittedly the entire thing, in the ultimate analysis, is a political process, economists could have greatly helped in the process. In the absence of it all, the sudden U-turn in 1991 was like putting the 45 year old 'baby', that had been carried all these years on the arms and the hip in fear of it falling down and contracting tetanus, suddenly on the ground and being asked to run.

It is not always fair or enlightening to compare the performance of the last decade with that over the previous 40, 30 or even 20 years. There are periods of high or low performance in the past in individual sectors. In the changed approach to economic development, both government and the public have to get tuned to the new methods of thinking and behaving. All the institutions, rules and regulations necessary in the changed context are not in place; many are not yet even in the mind. Like all the non-wise, we apparently must learn these the hard way, by our experience. Nevertheless, I would like to plead that 10 years of

changed approach is not a short period. Besides, there are experiences and institutions in the developing as well as the developed world for us to distil lessons from. That is where serious economic work can be of help. The gross domestic product grew at an annual rate of 3.79 per cent in the 40 years since 1950-51 (till 1991-92). Compared to that (the Hindu rate of growth), the average rate of growth from 1991-92 till this year appears much higher, about 6.4 per cent. But, as I was protesting earlier, this is not unknown in the India of yesteryears. Between 1980-81 and 1990-91, the GDP grew at about 5.4 per cent. So, there does appear to be some improvement, you may say.

Where does this improvement come from? It appears to have come from both agricultural and non-agricultural sectors. The average rate of growth in GDP from the agricultural sector during the period 1991-92 till 1999-2000 was about 3.3 per cent. This is significantly higher than the long period growth rate of about 2.43 per cent till 1991-92. Even if one takes the post 1988-89 years that year being an unprecedented one in the history of agricultural growth in the last half century the annual growth rate comes to about 3 per cent, higher than during any comparable period in the past.

Unfortunately, this cannot be attributed to the new policy regime. In the changed policy approach, there is little relating to agriculture, except the belated freeing of the co-operative credit system from the administered interest regime. The decline in public sector investment in irrigation, which for long was the larger part of investment in this field, was a deliberate policy decision since the beginning of the eighties, which has not been significantly reversed since. The large buffer stock of foodgrains at that time was the villain of the piece for this purpose; it has continued unabated. It is not clear if the new economic policy of less government is supporting this trend further. There are other reasons too: the precarious financial position of most state governments; the interstate disputes on river waters; the rising opposition to medium and large reservoirs. Incidentally, it is difficult to see any alternatives to such reservoirs for irrigation in the rain-shadow regions of peninsular India, where ground water is poor and uncertain, and minor flow irrigation sources are dry when the farmer needs water in a situation of poor rainfall. Even in the large river valleys of the north and the deltas of the east coast, flood prevention has been and still is a major consideration for large reservoirs. One does not know what direction government policy and approach will take in this matter. During the last decade, irrigation has not been an

important contributing factor to the higher rate of growth of agricultural income.

Two major factors appear to be responsible for the growth: rainfall and fertiliser application. The year 1988-89 saw an extraordinary increase in agricultural production about 18 per cent in foodgrains production even after allowing for the shortfall in the previous years. This was unprecedented. An important phenomenon was the great increase in kharif crop production. And this increase was helped by a 25 per cent increase in per hectare application of fertilisers in this single year, when all along till then the normal annual rise was about 5-6 per cent a year. There is reason to think that this was due to the high and the very well distributed rainfall during the crop growing season. The total rainfall during the main rainy season was considerably higher than normal (meaning the long period average) in 1988. But such high rainfall was not unknown in the previous 40 years there were at least five years with this level of total rainfall, but without this level of output. This is why I think the distribution of this rainfall over the crop growing season in most agroclimatic zones of India might have been the contributory factor to the very much increased level of fertiliser application and high yield. I have, however, not seen any systematic

examination of this phenomenon. Anyway, what about the subsequent years, since the growth rate of GDP in agriculture over the subsequent 11 years has been at least 3 per cent a year on an average? Looking at rainfall data, an interesting feature appears: From 1950 to 1996, the last year for which rainfall data were available to me from the Institute of Tropical Meteorology, I find five different periods, of unequal length, of good and poor total rainfall alternating: the 15 years from 1950 to 1964 saw two-thirds of the years with above average rainfall, the subsequent 10 years till 1974 with 60 per cent of the years with less than normal rainfall, the seven years from 1975 to 1981 saw six years with higher than normal rainfall, the subsequent six years from 1982 to 1987 with five years of poor rainfall, and the nine years from 1988 to 1996 with six years of much better than normal rainfall. Of course, deviation from normal does not necessarily result in poor or increased agricultural production; it depends on distribution over the season. But I wish to suggest in a broad way that the increased agricultural production and income growth rates during the last decade would be due to the overall favourable rainfall and possibly its distribution. It would be unwise to think and behave as if these palmy days will continue.

Against this background, it is necessary to consider the lines of approach to agricultural development, in terms of land reforms, irrigation, rural banking and cooperation, marketing and processing including development of roads and communications (how many of us are today aware of the fact that state governments even now ban export of farm produce to neighbouring states in the name of the poor!), new technologies, and related problems of local administration. I think most of these have little to do with the new policy regime, but with our cumulative experience and common sense.

What about the performance in the nonagricultural sectors? While the long-term movement, over the four decades ending 1990-91, in most of these sectors except electricity, gas and water supply, and banking and insurance was lower than during the period since 1991-92, the picture appears different if one compares the last decade with the preceding one, namely 1981-82 to 1990-91. Here we find no improvement in the post-liberalisation period in manufacturing, electricity, etc, banking, insurance and trade, but some distinct improvement in transport, storage and communications, and in public administration and defence and social and personal services. Since the last one is a sector where the growth rate changes when the administrators decide to value

their own services higher, the only significant increase compared to the eighties has been in the field of transport, communications and trade. This is hardly anything to gloat over.

The major source of improvement should be capital formation. It appears that while the gross domestic capital formation as a proportion of the GDP has increased from around 20-21 per cent to about 22 per cent in the last decade, there has been a steady decline in capital formation in the public sector. The private corporate sector has filled in the gap created by the decline in public sector investment; and during the last six years the total public plus private corporate gross fixed capital formation, as a percentage of GDP, has been one to two per cent higher than in the past. However, this, as we saw, is not very much reflected in the growth rate of non-agricultural production, except in transport and trade, in which, however, there was no significant growth in capital formation. In regard to other infrastructure items, mainly telecommunications have shown distinct rise in investments.

Since total capital formation has been somewhat higher than domestic savings, a large part of the excess has come from abroad, either in form of direct capital investment or GDRs. In fact, one major purpose behind the policy changes was to

attract foreign capital, particularly in the field of infrastructure development, and to promote technological improvement and competition. The approvals of foreign direct investments have so far tried to keep up to this approach: more than half the approved investment has been for infrastructure development power, fuel and telecommunications. But, partly for understandable reasons, the actual flow has been both much smaller and differently tilted. The actual total direct investments have been just about one-fifth of the approved. And, engineering industry (mainly automobiles?), electronics and electrical equipments (mainly video and audio equipments?), chemical and allied products, and finance accounted for nearly 60 per cent of actual direct foreign investments. Consumer goods had a high place in the units; quite a significant part of the investment has been used for take-over of existing units [Rao et al 1999a]. Under all these circumstances, it is no wonder that the growth rate in most sectors of non-farm production has not been any better than in the earlier decade.

Our policy in regard to foreign investment in the beginning ended with freeing many formerly reserved sectors for the purpose and giving approvals; There are many other aspects that were not thought of, or, shall we say, we had no time to bother about. The result has

been delays in actual investment, sometimes resulting in withdrawals, much higher cost than need have been the case including a greater possibility of wider exploitation of profits than via the straight dividend line. Moreover, we had no thoughts on pricing of the products of such infrastructure investments not price control of the old style but transparent negotiations and independent institutional agencies for ensuring this transparency and its results. In matter of competition, the MRTP Act needed changes, but little has been done till today.

One reads that the Russians are paying a heavy price for both ignorance about these needs and their advisors' cavalier attitude towards them. One would have thought that we in India were not all that ignorant about the free market. But we do not appear to have been up and doing in time. Is it not necessary for at least professional economists to deliberate on all these matters in earnest and come up with useful suggestions?

While the economic growth pattern of the last decade is nothing to go to town about, listening to radio and TV and reading the daily economic newspapers one gets the impression that we are on a great upswing. The Sensex is the big daily news. One is rarely told that except for the IT and some pharmaceutical and

consumer non-durable industry stocks, the price indices of the remainder of the 1,500 company stocks traded in the exchanges have not yet reached the 1994 level. If the stock market gives any indication of the state of the industrial sector in India, what is the indication of this? There is little analysis of the reason why the prices of these select stocks have been rising the way they have. It is reported that in only about 15 per cent of the sale-purchase transactions of these stocks do actual stocks change hands; in case of the remaining, it is pure speculative dealings involving only margin transfers. If the transactions by the foreign institutional investors, who are not permitted to carry forward their deals, are deducted from the total, the percentage of the purely speculative trading will be much higher than 85 per cent [Rao et al 1999b]. While speculation *per se* is not bad but useful, economists may examine if this order of it is in any sense useful, not to say indicative of industrial possibilities for investment.

Talking about the stock market, one finds that nearly half the foreign funds on private account coming to India were for portfolio investment. One half of this is in the nature of GDRs which are industry specific. The remaining are invested by mainly institutional investors in the secondary security market. Studies show that these funds are from two countries,



the USA and UK, and the investments are mainly by a relatively few institutional investors and the investments are concentrated in the stocks of a narrow range of companies [Rao et al 1999c]. These floating funds, with this peculiar characteristic of the investors and investment, can be a source of danger. In the globalising economies of today how peculiar circumstance in one country can lead to far reaching and devastating effects on distant, directly unrelated economies, through movement of such 'hot money', was seen in recent times from south-east Asia to Russia to Brazil to Mexico. As a student I remember reading, in Brown's massive work on the gold standard, how hot money movement caused the demise of the gold standard. Is it not necessary to study the Indian and related situations to suggest measures to prevent such precipitous possibilities?

I wonder if a part of the explanation of the recent recovery in the economy has not been the demand for certain durable consumer goods triggered by the sudden windfall receipts of the salariat class in India, as well as the stiff rise in the level of their emoluments. While the effect of the rise in the level can be considered durable, the windfall gain's impact can be only transitory. The finance ministry, in the changed situation, appears to depend on three factors for revival of a depressed economy: monetary policy

(chiefly the interest rate), fiscal measures like tax cuts and incentives, and demand propelled growth. If durable consumer goods industry's improvement has been largely demand propelled and consequently not durable at the level seen recently, like the desperate person the finance ministry looks at fluctuations in agricultural income as another such source: look at its explanation of the improvement in 1998-99 in the industrial sector due to the 'large' increase in agricultural production, which in fact was no more than the restoration of the 1996-97 level after a sharp decline in 1997-1998. And, the current year is again a year of acute agricultural shortfall!

The government no longer depends to any extent on any increase in public sector investment to give a push to the industrial sector in recession. Look at the budgets of the last three years: most of the increased departmental expenditure was on defence; nothing on roads, railways (excepting some Rs 2,000 crore proposed for next year), ports, communications, irrigation, all of which are still very much in the public sector, and could have given a boost to the sagging industries. It would be useful to examine afresh the role of such public sector investments in an economy like India's, before writing off recessions and depressions as the usual cyclical phenomenon in a market economy.

How large can be our dependence on the private consumer demand boost? Both from this point of view as also from the wider point of equity in our economy, it is necessary to look at the scene of income distribution in India. The simplest, from the point of view of data availability, is the changing ratio of non-agricultural to agricultural income per capita, which I shall call, with some apology, as the ratio of urban to rural per capita income. This ratio was 2.86 in 1961-62, and had steadily risen to 4.77 by 1994-95 [Rath 1999]. I have not done the later calculation; but I unhesitatingly suggest that it has increased further since. Even if we take account of the difference in rural and urban consumer prices, the real difference has widened by at least 50 per cent in these 40 years. The bulk of this relative increase has been since the middle of the eighties. Between 1989-90 and 1994-95 the per capita rural income increased by only 7 per cent while the per capita urban income increased by 21 per cent [Rath 1999]. The urban-rural income inequality is becoming wider, particularly in the post-reform period. Regional income disparities are also growing. In 1981-82 Punjab's per capita agricultural income was five times that of Bihar; by 1994-95 it was 7.5 times. These were the highest and lowest per capita rural income states; but the gaps have widened

amongst all states [Rath 1999]. I do not talk about urban income because the data are uncertain.

I have not been able to calculate personal income, or rather expenditure, distribution among different deciles of rural and urban households after 1987-88. There was only a little change in the distribution of per capita expenditure in rural India between 1961-62 and 1987-88. The differences are unlikely to have widened very much since. In the case of urban per capita expenditure, the differences are wider. It has been estimated that 10 years ago the top 3 per cent of the urban households possibly accounted for more than 20 per cent of the total urban income [Rath 1999]. There is reason to suspect this percentage to have risen since. This is the 'rich' India on which the new consumer goods industry is putting all its hopes. Unfortunately, the government too sometimes gives that impression. Amongst the lower income categories there are the 'poor'. Since this measurement game began, economists have spent more time and sophistication in refining the measurement than in discussing methods of attacking the problem. Unfortunately, when most official methods delivered little, efforts were made to solve the problem statistically. The latest available estimates by the Planning Commission, following the recommendations in the

Lakdawala Committee Report (in the preparation of which fortunately the late D T Lakdawala was not associated) show a steadily declining incidence in rural India. If correct, it is something to feel happy about. Unfortunately, however, the committee's method of measurement, to my mind, beats common sense [Rath 1996]; and one has no access to data to rework the figures. I therefore draw your attention to an independent set of data to draw conclusions from. Look at the per capita income of people dependent on agriculture in the different states between 1981-82 and 1994-95. The data show that till 1988 and beyond, only four states, Punjab, Haryana, Madhya Pradesh and West Bengal showed steady increase in average per capita income. In the other states it was either stagnant or continuously declining as in case of Bihar, Orissa and Gujarat. After 1988 three of the states, Maharashtra, Uttar Pradesh and Rajasthan showed a sudden spurt in that single year, followed again by stagnation. It is only seven states, accounting for one-third of the total rural population, that have registered a steady increase in per capita agricultural income since 1988 [Rath 1999]. If for two-thirds of the agricultural population the average per capita agricultural income has remained stagnant or declined since 1981-82 till 1994-95, is it likely that the incidence of rural poverty would have steadily gone down in India?

The reason for raising these questions here is to remind ourselves about two related things: If we are to depend upon demand driven development of the type seen recently, one must realise and deliberate upon whose demand and of what type. And, one must ask the question about the pattern of development one is thinking of. If two-thirds of the rural population is to be brought into the process of development, what should be the approach?

Rural and the poorer sections of urban India need employment, income, schools, medical service facilities, roads, and alternative job skills and opportunities. Are these still not the responsibility of the state in India? If so, what should be the approach to tackling this task? That the task is not simple is driven home by a simple exercise done by a scholar [Vidwans 1996] showing that if all the districts of Maharashtra are to be provided with the same teacher-student ratio for primary education for the entire population as in the best provided district, in these terms, in 1987, then with the present scale of expenditure on primary education and its planned rate of growth, it will take now hold your breath-more than a century! A shorter period of 20 years will imply that many state level activities presently planned and executed will have to be given up. I would plead that it is high time economists examine

this matter seriously and advocate appropriate changes at the state level if these basic wants are not to be perennially used either for writing papers and monographs or mustering votes. This question also raises the related question of decentralisation of power and revenue of the state below the state level, to the zilla Parishads and village panchayats not only for greater democratic accountability, but also for more relevant formulation, pricing and implementation of projects, a requirement that everyone talks about but hardly a couple of states have implemented so far.

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24 and 25, 2000.]

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## DATA ON EMPLOYMENT, UNEMPLOYMENT AND EDUCATION: Where to Go from Here?\*

Nilakantha Rath

*India had an enviable tradition of routine collection, collation and publication of empirical information. In the last half century we have added to this. But in our enthusiasm to do more and better, the official statistical agencies and their economic and statistical advisors have tended to centralise thinking and designing and processing of the information. This has led to atrophy at the state/regional level. There is, moreover, a tendency for every agency to be asked or expected to do everything. The large-scale surveys conducted at great cost should be fully utilised. This can be done if the task is properly decentralised. Finally, the NSSO must refrain from doing annual surveys in matters in which a quinquennial survey is more than adequate.*

The last half century, which is also the first half century of our republic, has seen vast improvements and changes in the information base of our economy, polity and society. We, of course, did not start from scratch or nothing. The British administration in India, from about the middle of the second half of the 19th century, organised collection and publication of routine information on a variety of subjects, mainly for needs and convenience of administration. The population census was one. In it, besides age and sex of the people, information at different stages was collected on caste, language and literacy, size of villages, etc., some of which have been both benchmarks as well as outstanding scholarly works, as in the case of the linguistic census of 1901 or the caste census of 1931. Routine data on exports

and imports were collected and published. But a new thing was the movement of goods by rail and water, including coastal shipping and river and canal transport within the country. An interested person could collect information about movement of different goods from one railway station to another, from one province to another the form in which these data were regularly published. I do not know about most other countries; but in the heyday of railroad and river transport in the US, such information was not routinely available. However, the irony is that now, with computerisation and all, the railway ministry does not any longer give such information even to the state governments.

Another very important data collection related to land. The British started survey settlement operations which provided

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\*Source: *Economic and Political Weekly*, Vol. 36, No. 23 (Jun. 9-15, 2001), pp. 2081-2087

periodic - once in 20 or 30 - years data on the different acreages of land put to different uses, the area of land held by different persons, the area leased in and leased out, the persons involved in this, the area put to different crops, the area irrigated sourcewise - all for every village. This was routine in the rayatwari settled regions. But in zamindari areas also this was done - routinely in the temporarily settled estates, and occasionally in the permanently settled estates at the request of the zamindars. These survey settlement operations and the revision settlements created records which were not only maintained in the rayatwari areas by the patwari or patel or talathi in every village but all mutations and changes were recorded by them every year. This resulted in the quinquennial publication of land use data and distribution of landholdings by size of holdings. The crop acreage data was one basis for estimating production of any crop every year; the other basis was the normal yield of this crop in the area collected with great care at the time of the survey settlement operation. An eye estimate of the particular year's rate of likely yield with reference to this normal provided the other basis for estimating total production. The limited and unexpanding area under irrigation and absence of any secular increase in crop yield rate rendered this a reasonable basis for estimating production. An important use of

this information was identification of drought or famine condition in the area. But no estimation of poverty or unemployment was required to undertake relief measures. Turn out at the test relief works started soon after the kharif season was the basis for estimating the magnitude of distress that needed employment provision as well as supply of foodgrains in the market. We shall return to it at a later stage. The crop cutting survey inevitably substituted the subjective anewari method for estimating yield in the post-independence period.

Routine data on employment in factories and in government establishments were collected. Most of the information collected and presented were meant to help local and central administration in routine administration and in formulation of policy. Macro use of these data for other purposes - like, for example, for computation of national income - was incidental. Today on this occasion of the completion of fifty years of the National Sample Survey Organisation, I remember the difference between D R Gadgil and Prashanta Mahalanobis precisely on this issue right in the beginning of the NSS.

#### EMPLOYMENT-UNEMPLOYMENT

Immediately after independence the Bureau of Economics and Statistics of the government of Bombay Presidency

launched a sample survey into rural and urban employment. In it 30 sample households were surveyed from every sample village. One household was visited on one day of the month and information about the time (i.e., day) disposition of the persons during the previous seven days was noted. This helped in obtaining information about size of the labour force separately for male, female, adult and children, the extent of unemployment and employment, classified into a number of occupations, during every month of the year. The survey was carried out in eight different homogeneous regions in the state and the data were presented separately for each region. The survey started in 1949 but was discontinued in 1954. (I do not know if the starting of the NSS had anything to do with this.) A similar but less well designed survey was carried out by the UP Bureau of Economics and Statistics, on a rather limited scale before 1954 when it was expanded. But this was also later discontinued.

The Poona Schedule of the National Sample Survey's first round had also a design somewhat similar to the Bombay Bureau's but with a reference period of three days; but this was conducted for only six months.

The NSSO conducted employment survey into rural and urban households from the 11th to the 17th round in a particular manner after which the size and coverage was reduced. The approach was to collect information on time disposition from individuals in the household for the preceding week on the date of visit, the visits to sample households being for 13 weeks. This gave a basis for estimating the average percentage of persons in the labour force, the average percentage of persons in the labour force fully employed, fully unemployed and the average extent of underemployment every quarter.

The Planning Commission, right from the beginning, was estimating the proportion of people in the labour force, the additions to the labour force annually in the plan periods, the extent of employment existing and likely to be generated and the extent of unemployment, with the help of the Census, the NSS and other data including data from the employment exchanges. The commission and others were not very happy with these estimates. Consequently, a committee of experts was set up under the chairmanship of M L Dantwala to go into the estimates of unemployment and suggest suitable changes in the methodology of data collection and tabulation for the purpose. Here we shall go into only the suggestions relating to estimation of unemployment

and employment based on the NSS, particularly those relating to rural unemployment, by the committee.

For reasons enumerated by the committee and known to all students of the subject, the committee stated that "It would be evident ...that a single numerical estimate of the unemployed cannot be very meaningful for conceptual reasons" (Para 3.3). "The level of employment and the size of labour force appear to change over different seasons of the year. It is therefore necessary to obtain separate estimates of the level of unemployment and the other labour force characteristics for different seasons. Further, in view of the possible difference in the peak and slack seasons in different states, it is necessary to obtain separate estimates for each state. A further distinction could be made between single crop areas with dry farming and areas with facilities for irrigation and multiple crops" (Para 3.9). The committee also thought that "Even in surveys of the labour force in urban areas, it is necessary to distinguish between towns of different size classes" (Para 3.10). They also recommended that "these should not be aggregated" (Para 3.11).

These separate estimates for regions and seasons, the committee thought, will remove one of the defects of the then

current method of estimation of unemployment. But another remained. The practice of classifying only those in rural areas who, because of lack of work, did not work for a single day in the week and in urban areas only such of them as were seeking 'fulltime work' as unemployed, resulted in underestimation of the unemployed. To get over this defect of classifying the working population into only two categories, the employed and the unemployed, the committee suggested use of the daily employment records of the seven-day survey period for estimating underemployment also. It recommended the collection of information for all members, rather than from only those who were classified as gainfully employed during the week as was the practice then. The committee also suggested change of measure of intensity of work from hours during the day to just a day without reference to hours.

Some of these recommendations of the committee were carried out by the NSSO in the employment surveys from 1972 onwards. Instead of collecting information on hours of work, the new method followed was to collect information on work or otherwise for a full day or half a day, as this was understood locally.

The NSSO over time has gone beyond the Dantwala Committee in collection of employment and related data, partly



because of the international (ILO) recommendations (in the shaping of which Indian survey specialists contributed significantly). Data are now available on the usual status basis where each individual is classified as employed, unemployed or out of the labour force during the immediately preceding year, on the basis of the longest time spent on any one of these three. The subsidiary economic activity of those in the later two categories helps the NSS to estimate the percentage of people in the labour force. Similarly for the weekly status, in which the priority rule is applied in placing a person in one of these three categories: first employed, then unemployed and finally outside the labour force. And finally, the daily status, in which the reported person days are added up for each of these three categories and then for all surveyed persons for all the weeks of the quarter (or round) to get an average picture of person days spent in employment, unemployment and outside the labour force.

These basic data relating to the usual status persons are also sub-classified by age, sex, education and monthly per capita expenditure, as well as by sector of employment, detailed industry and occupation class, occupational mobility, union membership and occupational mobility during the two years preceding the survey, etc. In addition, data relating

to the average daily earnings during the week are obtained from the regular wage/salary workers as well as from the casual labourers in urban areas as well as in the rural areas in public works and in farm and non-farm activities. The data relating to the unemployed, by usual status or weekly status, are sub-classified by age, sex, education (including marks obtained in the last examination) as well as by monthly per capita expenditure.

Scholars have often pointed out that in rural, and particularly tribal households, women regularly collect fuel wood and even roots and fruits for the household besides drawing water from long distances, which were not considered as gainful activity in surveys and in the national account. The NSSO has in recent years been collecting and reporting on the number of women engaged in fetching water from outside the village, and in activities for consumption (including processing paddy, wheat and millet), amongst other things earlier not included in gainful activity. Some of these are now taken into account in the national accounts.

These data are tabulated separately for urban and rural areas of each state. Moreover, now the data are available in floppies for scholars and others interested to try out other classifications and cross classifications.

The database on employment is much larger than what was available at the time of the Dantwala Committee. The employment survey was until some time back quinquennial. But policy-makers (Planning Commission?) found the data not only so useful but so important for monitoring the impact of policies as well as for changing and readjusting policies mid-plan, that they persuaded the NSSO to undertake a survey every year, thanks to high costs, at a thinner scale. This is being done since the 45th round of the NSS. Naturally, results vary, sometimes sizeably. One wonders if to obviate the controversies arising out of the difference between the results of the maxi surveys and the mini surveys, the government will ultimately ask for a large sample survey (maxi survey) every year. After all, employment is so important to the economy and people! This maxi and mini surveys have also become a pattern with consumption surveys, since measuring poverty every year is so important for this poor country!

With all due respect, I must state that it is difficult to understand what useful purpose is being served by such mini annual surveys whether for unemployment or poverty. Are there any policies or any operations of market forces for economic development whose impact on the employment situation will be so significant from year to year that an annual

monitoring is essential for the policy-maker and the people? (I just saw the 55th round of the NSS survey. Comparison of the data relating to the average days of employment, unemployment and outside the labour force between two large sample rounds, 1993-94 and 1999-2000, show that over these six years the average number of days in work decreased from 331 to 327 for rural males, from 345 to 343 for urban males, and increased from 241 to 246 for rural females and from 279 to 288 for urban females; the average number of days in unemployment increased from 15 to 19 for rural males, from 11 to 15 for rural females and decreased from 9 to 8 for urban females and no change at 10 days for urban males. With such differences over a six-year period which to an ordinary person like me appear to be of little significance, I find myself completely out of my depths to comprehend how fine a tuning of economic policy the Planning Commission or the government of India or any one else responsible for it must be attempting with economic policy on the basis of every year's data from the mini surveys!) It is an utterly wasteful exercise. Apart from presumably generating some more employment at the NSSO end, it possibly helps professional analysts to write papers for faster promotion and consultancy!

The NSS data on employment and unemployment, despite its very expanded scope and coverage, suffer from some severe limitations from the point of view of the planner and administrator. The data say how many person days are spent in unemployment in a week or a season (i.e., a quarter, an NSS round). But, it simply does not tell the planner or administrator how many persons may be available for work in a season if the state were to open up employment opportunities at the ground. The data only tells us how many (or what proportion of) people were unemployed for a whole week and for specific number of days in the week, on an average during the season. This does not help meet the above need of the administration.

I have not seen it documented, but many years ago I learnt from the then Director of the Bureau of Economics and Statistics of Maharashtra that when the state government decided, in 1974, to start the Employment Guarantee Scheme in rural areas to provide employment to whosoever desired, at a basic subsistence wage, it asked the Bureau to provide an estimate of the number of workers that might turn up in such works if government stood by its commitment to provide work. The Bureau prepared an estimate on the basis of the NSS employment data. By the end of the year, however, it was found that the turnout of workers was

almost twice what was estimated, with women constituting half the workers in these works. I was not surprised. The reasons are twofold.

In the first place, the collected/tabulated data do not tell how many are unemployed for what length of time in a season and, depending upon duration of the work opened up, can be expected to turn up at the work site. A non-statistician like me would think that this might require collection of information from the sample persons for much longer period a whole quarter possibly to be able to get this estimate. The NSS is not designed to do that. But I have read a paper by a very competent statistician who has worked with the state government for long in the capacity of the government's main statistician, S M Vidwans, published in *Sankhya: The Indian Journal of Statistics* in 1980, which makes an attempt to show how from the existing NSS data one can derive this estimate, by using suitable statistical logic and method. Let me quote:

...it [the NSS tabulations] could not generate an estimate of the number of persons who were available for additional work during a period of a year or a season (or an NSS sub-round) and their classification according to the number of days of availability. It is this information which is essential for planning employment oriented public works programmes in the rural areas. Because the NSS data was collected with reference to only a week it was believed

that the NSS data could not yield such estimates of numbers of persons. The object of this paper is to show, by more complete analysis of NSS data, that it is possible to estimate the number of persons who were available for work during a season (i.e., an NSS sub-round of roughly three months or 91 days) and further to estimate their distribution according to their total number of days of availability for work during the season. The attempt here is to suggest an approach by which the information can be extracted from the existing NSS data and not to claim any finality about the particular statistical model used in the paper [Vidwans 1980:110].

I have quoted at length to indicate what the paper attempts to do. Vidwans uses the NSS data for the Vidarbha region of Maharashtra excluding two districts for purposes of relative homogeneity. I have no competence to judge his model and method. All I can say is that at the end of his model fitting exercise he comes out with quarterly estimates of the percentage of males/females with days of unemployment varying from 14 days to more than 84 days, with a 14 day interval, for each sub-round of the year. Naturally, he does not claim any finality for his methods and results. What he suggests is that the present style of data collection on employment can help us estimate proportion of persons with different periods of unemployment. He suggests, rightly in my opinion, that such estimates should be made for smaller homogeneous regions and can be attempted for sub-groups of

the population, like cultivators, agricultural labourers, etc. For this and for checking the results at the ground, he suggests NSSO trying out data collection for a larger sample for different homogeneous regions and for a longer reference period than a week, say 15 days. It is surprising that such a suggestion that would not involve great cost, but competent statistical analysis, which fortunately is sufficiently available in this country, has not even been given a try in the last 20 years! I would strongly plead that a trial exercise along the lines suggested by Vidwans be attempted before long.

Vidwans rightly uses the expression underemployment rather than unemployment since in rural India underemployment is the dominant characteristic. Most people who are without work for varying periods are also engaged in gainful activity for similarly varying periods. In any case, the NSS data relate to overt underemployment.

But the underemployment in rural economies like India is only partly overt. It is partly, possibly to a larger extent, hidden. A little over half a century ago Joan Robinson characterised it as disguised unemployment. She was, of course, talking mainly about the developed economies where a more productive person was doing, because

he/she was forced by the economic situation to do, a less productive job. In rural India, particularly in the self-employed occupations, this is suspected to be widespread. That is the second reason for which the turnout at employment works was much greater than NSS data suggested.

The point to note is that a time measure of employment or unemployment simply cannot catch this. In wage or salary paid employment, the employer considers the payment worth the effort put in. Of course, the employee may think he is worth more in some other work. If this is true, he is underemployed. But this is a matter that cannot be identified and measured by putting hypothetical questions. Unfortunately, this is what the NSS has tried to do in the past, and this is what the Dantwala Committee had also thought relevant [Dantwala 1970:3.18].

In economic terms, underemployment or disguised unemployment is essentially an income-based measure or measure in terms of the productivity of the worker. Strictly speaking, a person is disguisedly unemployed if, while he is engaged in some apparently productive activity, the value of his marginal product is zero or very low (in relative terms). In certain types of self-employment where there is a routine daily earning, it may be possible to attempt such a measure. But in others

where income is received in a lumpsum at the end of a season of work, this is more difficult, if not impossible. Let me illustrate, and try to draw some implications for the NSS employment survey.

Take an elderly woman-or any other person for that matter-selling berries or local fruits or groundnut or even tea by the roadside. It is possible to gather information about her earnings every day for which information on work is sought. This information, with a little additional information, may give a fair indication of the daily return to labour. If for working for the whole day the seller is found to be earning a pittance, say only a few rupees at present-day prices and wage rates, it would be possible to suggest that she or he is grossly underemployed or disguisedly unemployed despite the fact that he or she was spending the whole day in the activity.

The NSSO does not collect such information. But I would think that it meaningfully can. Today information is collected about the daily wage or salary received by the wage earners or employees. (These data are averaged over a week and presented, when I would have thought that the work days in different industries in which the wage workers were employed could be classified on the daily wage basis. Of course, this would be more revealing if

the region for which it is carried out is smaller and the sample size larger both of which is possible in the present scheme of surveys. But, that is another matter to which I shall come later.) But no attempt has been made to collect such information from the self-employed traders.

There has been a significant rise in the percentage of non-agricultural workers in rural areas, and possibly in small towns, during the last two decades. Analysts and students see this as a very positive development for the economy. I hope they are right. But there are developments in the rural economy that make one wonder how much of this non-agricultural work might be really gross underemployment or disguised unemployment. The landless labour population has greatly increased in number and percentage. The pyramid of agricultural landholding has steadily flattened with a wider base and a steadily lower vertex, implying disproportionate increase in the number of marginal and small farmers. Work on farms has increased at a slower rate than the rural labour force. With greatly increased roads and transportation on the one hand and a fast growing number of persons looking for non-farm work on the other, is it possible that a not insignificant number is engaged in such self-employed trading? Indeed, is there a possibility that a small growth in the demand for such

trade is being shared by a disproportionately large number of the needy workers, disguising unemployment thereby? I think the NSS can help in collecting information that can help analysts, policy-makers and administrators to understand and assess the phenomenon.

Let me turn to the question of the other type of self-employed who do not have a daily wage/salary. Take farming. The workers in the household are reported to be working on farm-related activities which are recorded as gainfully employed time. But it is quite possible that the farmer, finding that there is no other work available after the immediate seasonal operation in the field is over, may spend time in other field- or farm-related work that might add little to the total income from the farm enterprise. This time disposition would be reported as farm or farm-related work, though in effect it is disguisedly unemployed time.

You will pardon me for referring to an old exercise of mine in this context [Rath 1983], since I have not seen other such an exercise. In 1954 the union ministry of agriculture had started in every state in India what are called Farm Management Surveys which continued for almost a decade and a half until it was superseded by the present Cost of Production surveys in the early 1970s. The scheme was to collect all farm data on a daily basis from

16 sampled farm households in each of 10 sampled villages from two agriculturally homogeneous adjacent districts. The data related not only to all inputs, plotwise on a daily basis, but also to the daily work account of all household members for the 365 days of the year. I tabulated the daily information about the purpose wise time disposition of all the male members of the sample farm households, numbering 263, in two districts of Maharashtra in 1956-57, which data were easily accessible to me. The average percentage of the total number of unemployed days of these male workers in the year turned out to be 6. Interestingly, this was no different from the 6.2 per cent for adult males in rural Maharashtra in the 32nd round of the NSS. For the weaker section's adult males in the 25th round of the NSS it was only 4.4 per cent. Calculating the seasonal pattern of employment and unemployment, it appeared that the rate on unemployment ranged between 3 and 10 per cent. Excluding the extremes, the range was between 4 and 8.5 per cent. Calculating the quarterly rates, NSS style, the range was no different for any quarter. I wondered how, in the light of this, a policy-maker can arrive at the hard core of unemployed, ala the Dantwala Committee, for any specific region.

But, more interestingly, these adult male workers spent 28 per cent of their year in looking after their farm cattle. These were days in which no other work was done by them; on other days some time was spent in looking after cattle in addition to other work, which is not included in this. If the half day unit of the present style of NSS were to be applied, the percentage would be 21. Was this all necessary and worthwhile work? I found that 21 workers 18 of them from large cultivator households had enough cattle on farm to apparently justify spending the reported time on this work. Their days on cattle work accounted for 20 per cent of the total exclusive time spent on livestock by the male workers. There were 75 others who spent little or no time (less than 10 days) in looking after livestock. Excluding these two groups, the remaining 167 males spent substantial time in this work, with 81 workers reporting more than 100 days of work each, 75 of whom had reported no day of unemployment. Their cattle work varied inversely with their work on the farm the days on which there was no farm work, the work of looking after the cattle increased. Looking at their size of cattle holding it was difficult to maintain that all or even the bulk of this time was called for by the requirements of their limited cattle holding. I concluded that a part, surely a very large part, was merely to keep themselves occupied somehow. If

this is correct, the underemployed time of the male workers was much more than twice what the NSS style time disposition data suggested.

I had examined this question with only the time devoted to cattle work because this was relatively easier to check objectively. But, there is every reason to think that this is true of the so-called domestic work, for the duration of which the worker is assumed to be outside the labour force. An ordinary person does not like to sit idly, if he can help it. There is a saying in Oriya, 'It is better to sit and cough than just sit idly'. This is true of some of the time male workers spend on domestic work; it is possibly much more true for adult females who withdraw into domestic work when their farm work comes to an end.

This I think is an important reason why the turnout of workers in the Employment Guarantee Scheme works in Maharashtra turned out to be much larger than suggested by the NSS calculations, and particularly so for women. (Please remind yourselves about the test relief works of yesteryears as a device to estimate employment needs under distress.) In order to find out the type of people who turned up at EGS works, the government designed forms for collecting information from them about the distance they had travelled, their family circumstances,

etc. It is not answers to hypothetical questions but such objective conditions that gave information about who move and why. It is a pity that the EGS is today not what it was.

This type of underemployment can also be seen even in total agricultural employment. I seek your indulgence to quote another example to illustrate my point. I am referring to the results of a very careful empirical investigation in a tribal area reported in an unpublished PhD dissertation in 1992 [Samal 1992]. The data relate to 1984-85. The data were collected every day of the year for every member of the household. The tribal village practising shifting cultivation reported no day of unemployment by any one. But, the author showed that the reported days on household work increased for both men and women when the farm work ceased. The more interesting fact related to the income per labour day in different types of activities. Work on own farm (mainly shifting cultivation) occupied 50 per cent of the days in the year, but accounted for only 14 per cent of the total income of the households. The average income per labour day from such farming was 42 paise only. As against this, the very limited wage labour in a neighbouring village fetched 3 rupees a day. And, stealing bamboo from the forest at dark nights, 16 times in the year, and selling those at the taluka



bazaar after carrying those headloads at night through the forest, occupied about 5.5 per cent of the days but fetched them 25 per cent of their total annual income, the average daily earning from this activity being Rs 7. If it were possible for them to harvest bamboo legally and sell those on a systematic basis throughout the year, shifting cultivation would automatically come to an end.

I realised that this is not mere hypothetical story when, travelling in this area, I visited a soil conservation work. The officer, during the preceding five years had, with the help of local tribal labour, planted 'ghaipat' a bush whose leaves are good for making ropes, as essentially a soil conservation measure on the bare hills, some of which I moved through. Then, with the permission of the government he started a rope making unit using these leaves which could be systematically harvested. The villagers of 4 nearby villages got regular work in the rope making unit at no more than the going daily wage rate in agriculture in the neighbourhood. The result was, within two years the shifting cultivation practised by these villagers came completely to an end, without his asking them to do anything about it. Two or three rupees on a fairly regular basis was much better than 43 paise a day in shifting cultivation. Work programme on a regular basis revealed the gross underemployment of

the tribals practising shifting cultivation. That the government department's failure to sell the ropes in a year of somewhat depressed rope prices led finally to the closure of rope making and renewal of shifting cultivation is another part of the story.

The nature of concealed underemployment revealed and estimated above simply cannot be derived from the NSS employment data. And, therefore, for any information about the requirement of employment or the possibility of turnout of labour in any serious assured work project, the severe limitation of the NSS data should be evident. Nor is there a chance that the NSS, designed as it is, can fill the bill.

But, it is not possible to understand why NSS should be required to provide every possible data and serve every such purpose. Fortunately, a parallel sample survey of farm households on an ongoing basis since 1972 is there which collects a vast lot of relevant information for this purpose. I am referring to the Cost of Production Surveys, whose earlier version, the Farm Management Survey data, I had used for my exercise referred to earlier. Detailed farm input and family employment data on a daily basis for the whole year are collected in these surveys. The schedules contain not only daily material and human, animal and machine

labour input data plotwise for every sample farmer for the whole year, but also data on time disposition of the members of the household. It is extremely unfortunate that though the data are being collected, at great cost, on regional basis for the last 30 years, the only use to which they have been put is to calculate the cost (or, costs) of production of the dominant crop which forms the basis for the sample of farmers drawn in the region. The remaining data are not even tabulated, much less put to any use. I have been a sceptic about the relevance of such detailed regional calculation of the cost of production of a crop for its price fixation for support or procurement. But that is not the matter of discussion here. This survey, conducted for whatever purpose, is collecting a vast lot of farm and farmer related information whose potentiality for a variety of purposes is very great. Let me venture into it in a summary fashion for our purpose:

(a) The survey can yield data on labour use per hectare for all the individual crops being produced by the sample farms, for total seasonal and annual labour use per hectare per gross as well as net cropped area. This will give a basis for a regional estimate of the changing labour days in agriculture. The regions in the cost of production survey for this purpose are more homogeneous than the states which constitute the unit for the NSS.

(b) Changes in labour use operation-wise in individual crops can be compared over time to find out the effect of new methods as well as of mechanisation of operations on labour use in different crops in different regions.

(c) One can monitor the changing practice of employment of casual daily labour and contractual labour for specific operations.

(d) It can give us idea about changing proportion of hired and household labour on farms of a given size growing a particular crop.

(e) It can clearly define and describe seasonality in farm employment during the year.

(f) It can indicate the extent of unemployment of members of the farm household at different times of the year, and for varying lengths of time.

(g) It can provide database for estimating the magnitude of disguised unemployment in households of different sizes of landholdings in different activities.

None of these need be carried out centrally as is the current practice with the calculation of cost of production. The data are relevant and useful regionally and should be processed and tabulated in that manner. In fact, such use would also lead to a more useful demarcation of regions even for a single crop than is done at present. For example, even for a single

crop, paddy, the tribal areas of the central Indian tribal hilly and forest belt should not be clubbed with neighbouring plains, tribal and nontribal. The relevance can be guessed from the example cited above. [Even in terms of cost of cultivation, the average cost per quintal as well as the average yield per hectare in these tribal areas are way below those on the adjoining plains.]

The data are collected by the agricultural universities as agents of the ministry. To the best of my knowledge, the universities keep a set of the filled up schedules. They are free to use the data for any purpose other than calculating a parallel cost of production which is the responsibility of the ministry. But no university has made use of these vast data of which they are the custodians, and no state government has thought it necessary to ask relevant information from the universities. There were occasions when some state governments thought of or started parallel cost of production surveys for calculating their own cost of production! Fortunately, this madness did not last long. But the vast body of data remains unutilised. The ministry on its part also does nothing with it other than publishing at intervals the average per hectare labour input data for the major crops for which costs of production are calculated.

The limitations of the employment data collected by the NSS are obvious. There is scope for improving the data collection design to meet some of the present inadequacies, as suggested above. A fuller analysis of the NSS data as suggested by Vidwans, on a regional basis, is also called for. On some other aspects proper tabulation and analysis of the cost of production survey data would be able to supplement the inadequate NSS results. But all this requires regional analysis of not only the cost of production data but also the NSS data.

The NSS data today are tabulated statewide as well as on an all-India basis. Many states are like huge countries with considerable regional differences. Even a broad matching with the cost of production regions would require tabulation of NSS data at a comparable regional level which would be sub-regions of states. This would be statistically feasible and meaningful if the state and central sample data for the state are pooled. It is a great misfortune that the state sample data collected at great cost are very infrequently processed and published. As would be obvious, for a better understanding of the situation in different regions of the country these data should be pooled with the central sample data, appropriately analysed and published.

How to make the state governments and the state statistical bureaus begin using the vast information at their disposal? One solution that might occur to the angry and the annoyed is for the NSSO ceasing to do' the state level tabulations and throwing the responsibility on the state bureaus and their governments. 'Put the drum round their necks, and they will learn how to beat it, some well, some not so well', it may be said. The NSSO will be responsible under such condition for producing only the all-India tables. Under the present-day inactivity at the state level, this advice may appear understandable; but I think it is inadvisable.

Firstly, it is necessary to realise that the all-India tables by themselves are worth little for policy purposes. (The international experts and agencies may be happy with those; but their happiness will not enable us to design our policy.) I have tried to suggest above that the data for policy purposes must be regional. This is what the Dantwala Committee had suggested: don't aggregate (at the national level), it cautioned. Vidwans's exercise makes the same point: meaningful analysis should be for homogeneous regions, groups. I am suddenly reminded of the Lakadawala Committee's recommendation about statewise poverty measure on the basis of an all-India consumption basket and the corresponding poverty,

level per capita expenditure. In our anxiety to make the states do what they must, we should not sacrifice common sense and relevance.

Moreover, the government of India and the NSS should not run away from their responsibility, having been responsible for the situation that has emerged over the last half century. Over the years the central initiative and organisation of work, analysis and policy formulation has led to a situation in which there has been a growing atrophy in these matters at the state level. And, now to suddenly to throw up hands in despair and disgust may appear irresponsible. This is what Gadgil was fearing and this is what appears to have come to pass. The solution to this is to bring the highest authorities in the state together and explain what is necessary and desirable and where the interest of the state lies. The state governments have to equip their bureaus with computational equipments and, where necessary, competent statisticians, who would not merely create supply but also be able to create demand for the right data. It would not be enough to formally write and talk about the possibilities. It would be necessary for the NSSO to design analysis along the various lines mentioned (and not mentioned) here with pooled disaggregated data at the state level for one or two rounds to

train and persuade the states to enthusiastically take up such task. This will not involve much money, but more initiative and analysis. This would also open up the possibility of states asking their bureaus for data relevant to specific policies. If the centralisation trend is to be reversed and meaningful results are to be obtained, this effort on the part of the NSSO and the government of India appears to me necessary.

#### EDUCATION

Now, let me turn to the second subject I propose to discuss briefly, namely, education. There are three major sources of information on education today: the Census, the All-India Educational Surveys, and the NSS. Each covers some common ground, and each covers some different matters as well.

The Census gives information on literacy and the level of formal education of the population, by age and sex and social classes, from the district level upwards. In addition to these data relating to the population of every village and town, the Census also collects and provides information on the location of a primary/middle/secondary school in the village and the availability of an all-weather approach road to the village. Unfortunately, these latter information are available at the end, about seven or eight years after the Census operation.

The All-India Educational Survey is conducted under the aegis of the ministry of education of the government of India. Six rounds of this survey have been completed and published so far. The first round was conducted by the ministry. The subsequent five surveys have been conducted by the National Council of Educational Research and Training. These surveys are really in the nature of census of all educational institutions in the country, whether government run, aided, or unaided. The records about the students and teachers in these educational institutions provide the basis for tabulation. It covers the number of students enrolled in different classes, by sex and social groups, their age groups, the dropouts at every class level, the various helps, financial and otherwise, provided by the state to number of students, and recorded data relating to qualification, duration in service, salary, etc., of teachers. The information about the location of schools, not only with the village as the unit but also with the hamlet or habitation as the unit is provided. Such habitations are classified according to the distance the children have to travel to attend school, if they wish. This is a vast mass of information which is available at the central level in published form, with the state as the unit of tabulation. While the data are collected from the village/town level upwards and must be there in appropriately aggregated and tabulated

form, these are rarely available in printed form. (I have seen state level authorities in the educational field desperately searching the all-India reports for information relating to their state. Better not to talk about the interested ordinary citizen).

These records from the institutions will naturally not be able to tell the why's or the circumstances associated with some of the findings or developments, besides, of course, not being able to say anything about the reliability of the records. For example, how reliable are the records about enrolment? Children from what type of households drop out, and from what type of households continue in school? Of course, question of the household circumstance of children not getting enrolled does not arise in the context of this survey.

Some of these questions are sought to be answered in the NSSO's surveys relating to education. These data are collected as a part of the employment surveys, with special questions asked in the schedules. The NSS data not merely give information about literacy and levels of education, but also about free education, different types of aid and concessions in continuing education and even expenditure incurred by the household in the education of the educands. Similarly, questions are asked about reasons for

dropping out of school or not attending school at all. Special enquiries, as a part of the survey into employment, have also been conducted to find out about the type of work in the household, or in household enterprise or in other wage works and the reason why they work, relating to the children of age five to 14.

Surely these are very useful informations for everyone concerned. But, except for the information about work by children going or not going to school, the data about education broadly repeats what the Education Survey reports. But, unlike that survey, the NSS which visits the sample household could have thrown light on the circumstances that might be leading to not attending school or dropping out of school. Of course, questions are asked and response of parents are tabulated about the reasons for not going to school or dropping out of school. These are opinions. However, there are objective conditions that may lead to this which information is not obtained and the results tabulated with reference to these. Let me illustrate my point with a few such circumstances. If there is no primary school in the village and/or the school is located at a considerable distance from the habitat, there will be reluctance on the part of parents to send the children so far. This is possibly much less the case in most non-tribal villages. But this is very likely a relevant circumstance in many

tribal villages in and around the forest areas. There may be a school in name but there may be no teacher attending the school. Such schools will not feature in the All-India Education Survey as such.

An even more important circumstance may be the level of education of the parents. Could it be that parents with no education, or even literacy, will be much less enthusiastic about sending children to school or prevent their dropping out. When a parent asks, 'What is the use of going to school (or, continuing)?', which is reported by quite some in the NSS survey, the appropriate thing would be to get the objective ground experience on which it is based: Has another child in the family gone higher up and is without any better occupation? Is this the experience of the father? The NSS classifies non-attendance and drop-out by monthly per capita expenditure (MPCE). But, one finds low MPCE households sending children to school when some households in higher categories do not. Has this something to do with the education and earning experience of the parents in the households? These questions appear relevant for policy purposes: special efforts are necessary to persuade and help children from illiterate households or households with adverse experience with education. The NSS does not appear to attempt these. In fact, as in matter of employment, there appears to be a greater

reliance on opinions and response to hypothetical questions than on what might appear as relevant objective circumstance.

Since there are three major agencies of the state collecting data on literacy and education and circumstances influencing it, I think a certain coordination in their timing as well as coverage would be rewarding. The Census will of course be undertaken when it is. The All-India Education Survey can be timed suitably between two censuses. The NSS round covering education should come in a year different from these two. This will provide some basis for judging temporal changes. The Census should publish the data relating to the villages early to facilitate relating literacy, etc, to location and other relevant facilities in the village. The NSS on its part should collect data on objective circumstances relating to the habitat and the household to facilitate relating these to education, attendance and dropouts. In this matter, as with others mentioned above, the state and central samples should be pooled for better measure of the replies to these questions. In fact, the state bureaus should feel free to add and subtract items in the survey schedules in the context of their relevant conditions. It will also facilitate tabulation and analysis on a subregional basis in the state.

## CONCLUSION

India had an enviable tradition of routine collection, collation and publication of empirical information. In the last half century we have surely added to this. We have developed an excellent training system in statistics that has resulted in the Indian statisticians manning important international organisations. But, as we saw, in our enthusiasm to do more and better, the Indian statistical agencies and their economic and administrative advisors have tended to centralise thinking, designing and processing of the information. This has led to atrophy at the state/regional level, when it was the opposite before independence. In the process, matters of relevance to the local administration and policy-maker tend to be forgotten or slurred over. Moreover, there is a tendency for every agency or organisation to be asked or expected to do everything. As we saw, the NSSO simply cannot measure properly the underemployment in rural India. There are other surveys that can throw light on this to a significant extent. In the matter of employment, the taste of the pudding is in the eating. The most appropriate way to find out the extent of rural underemployment is to start rural employment works at subsistence wage, on piece-rate basis. The statistical information collected and reported should have relevance to policy. If we do not wish to do anything about it,

there is no reason to waste our endeavour on data gathering. But, even in that situation it is better to warn the interested party about the inadequacy of such estimates. The large-scale surveys conducted at great cost to the national exchequer should be fully utilised, and not wasted as in case of the Cost of Production Surveys. This can be done and done in time and in a meaningful way if the task is properly decentralised. And, finally, the NSSO should in my opinion refrain from doing annual surveys in matters in which a quinquennial survey is more than adequate. If we keep these considerations in mind, we can generate a tremendous amount of very relevant information for policy as well as analysis at no more cost to the national exchequer. Can one also hope that presentation of such data in a meaningful way at the regional level, year after year, will create an additional pressure on policy-makers to rise to the occasion?

[Keynote address at the seminar on Understanding Human Development through National Surveys, organised by the NSSO in Pune on April 6, 2001, on the occasion of the golden jubilee of NSSO.]

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## DECENTRALISED STATISTICAL SYSTEM: REPORT OF THE NATIONAL STATISTICAL COMMISSION\*

Nilakantha Rath

*The Report of the National Statistical Commission is a most welcome effort which seriously proposes to stem the rot that has set in the field of Administrative Statistics that is the basis of most socio-economic statistics in India. It has wisely rejected the Modernisation Project of the Ministry of Statistics and the World Bank. It has outlined what amounts to an independent professional set-up at the highest level to lay down the policy in the field of the Central and State Statistical Systems. It has underlined the need for state governments to treat their administrative data reporting agencies as useful agencies for the purpose, since without this data base the government will be blind about both formulation and monitoring of policy. The missing and inadequately treated individual items should deserve the attention of the National Commission of Statistics (NCS), which should be expeditiously established by the government.*

The 19 months' labour of the National Statistical Commission has produced a report that should provide far-reaching guidelines to policy-makers and be of great use to the concerned scholars and administrators. Ever since the Bowley and Robertson report in the mid-1930s, there have been different committees on some or other aspect of the Indian statistical system. But there was no comprehensive review of the system that has emerged during the half-century since independence. This half-century saw many new innovative systems as well as the decline of many others that had been established at the provincial level even before the beginning of the 20th century to aid local, provincial as well as the federal governments in their day-to-day administration and in policy-making. This decline on the one hand and the rise of the new innovative systems on the other led many policy advisors as well as experts from international organisations to seriously propose the dismantling of the older system and its replacement, across the board, by the new system that had come up in specific fields. The ground for this had been prepared with one report to review the NSSO and another all-India seminar to go over the entire ground on the basis of a document prepared by the Ministry of Statistics. Fortunately, at this stage, instead of accepting these recommendations, the government decided to set up the National Statistical Commission in January 2000 with very comprehensive

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terms of reference. The commission in its report has not merely reviewed the entire statistical system in India but has firmly put its foot down against scrapping the decentralised system of collecting statistical information.

The report is in two volumes: the first contains three chapters the introductory one describing the setting up of the commission, etc; the second giving an overview of the problem and the approach adopted by the commission; and the third reproducing all the recommendations in the individual chapters in the second volume. The second volume contains 11 chapters, one for each major sector from which statistics are collected and a final chapter on the Indian Statistical System. The sectoral chapters are: Agricultural Statistics, Industrial Statistics, Trade Statistics, Service Sector Statistics, Infra Structure Statistics, Socio-Economic Statistics, Financial and External Sector Statistics, Price Statistics and National Account Statistics. Both volumes also contain many annexures with relevant data and information.

Every chapter contains accounts of the types of statistics collected at the central, state and even local levels, the method of collection, the agency used to collect and collate and the frequency of publication. The strength and the weaknesses of the entire process are analysed in terms of

their administrative and technical requirements and then the commission makes its recommendations about it. The report, therefore, is not only a very useful source-book relating to the official statistics collected in India at present but lays down specific guidelines for stemming the rot that has set in and strengthen the decentralised system with appropriate institutional devices and training programmes.

It would be difficult to review the many recommendations of the commission on every field examined by it, nor is it possible for one, like me, who is not familiar with the character of data from every field. I shall mainly highlight the examination by the commission of the Indian Statistical System contained in Chapter 14 and then go over briefly into a few of the sectoral chapters noting in particular some of the inadequacies and strengths.

A very large part of statistics relating to the economy and the society is collected in a decentralised manner by different ministries at the centre and departments in the states. The data are collected as part of the routine working of the ministry or department. In addition, ministries or departments organise special surveys periodically to fill in certain data gaps, relevant for policy formulation as well as for monitoring effects of

implementation of programmes. In design and in effect the entire system is decentralised both vertically and horizontally. There are institutional devices for both lateral and vertical coordination. In addition there are special surveys conducted by agencies like the NSSO collecting detailed primary data from the households and trading and manufacturing establishments that serve the purposes of both the government and planners as well as of the scholars.

The commission states that "the major failure is in the Administrative Statistical System". The commission attributes it to "the near total failure of the administrative machinery of the [state] governments". "...over the years the administrative statistical system has been deteriorating and has now almost collapsed in certain states. The deterioration had taken place at its very roots, namely, at the very first stage of collection and recording of data, and has been reported so far in four sectors: agriculture, labour, industry and commerce. The foundation on which the entire edifice of Administrative Statistical System was built appears to be crumbling, pulling down the whole system and paralysing a large part of the Indian Statistical System". "The other reason is the lack of effective coordination between different statistical

agencies, especially at the centre". The CSO, the commission says, has failed to effectively carry out this coordination.

### **Over-Dependence on All-India Survey**

While knowledgeable people will not dispute the commission's diagnosis and the reasons for the same, I think the commission has missed another factor that has contributed to this. While administration has collapsed, administrators have come to depend, more and more, on the all-India Sample Surveys conducted mainly, but not exclusively, by the NSSO. Earlier, in pre-independence times, administrators, for example, used to depend upon the revenue records for information about size distribution of landholdings, extent of tenancy, extent of irrigation, etc., mainly in 'rayatwari' provinces. Today, there is no reference to it; indeed, the data are no longer regularly collated and published. The dependence is not even on the quinquennial agricultural census. It is on the periodic sample survey of landholding conducted by the NSSO. The same is the situation about vital statistics. The dependence is more on NSS and on the periodic National Family Health Survey. The municipalities no longer bother about careful registration of shops and establishments; when data are

needed, recourse can be had to the quinquennial Economic Census now conducted by the NSSO. Examples can be multiplied. The centralised countrywide sample surveys have become a convenient excuse for the administrators not to bother about proper collection and collation of statistical information in routine manner as earlier.

This was the fear expressed by D R Gadgil in his correspondence with P C Mahalanobis in connection with the National Sample Survey which the latter was proposing to the government in 1950. And that has come to pass. Indeed, the Department of Statistics of the government of India, with the support both professional and financial of the World Bank proposed precisely this in a formal Modernisation Project. The entire project, submitted to the government of India, is available on the web. It would be useful to know the gist of it in the words of the commission. Let me quote at length:

14.3.16 In the late nineties, the Department of Statistics was designated as the nodal agency for Real Sector data categories of International Monetary Fund's Special Data Dissemination Standards (SDDS). Faced with this responsibility, and the perceived weakness of the statistical system, the DOS came up with a proposal for creating a Statistical Authority to have centralised control overall official statistical agencies. It also put up a project for modernisation of the Indian Statistical System, to be financed through a loan from the World Bank. The main thrust of the project is on three

measures: (a) Conduct of additional surveys to cater to the need of SDDS requiring expansion of NSSO to replace the failing Administrative Statistical System, (b) Expanded use of Information Technology, and (c) Creating a Central Training Institute for all level of statistical personnel. The project has not considered adequately the problem of strengthening of the statistical system in the states.

14.3.17 The first measure, the massive expansion of National Sample Survey, as a quick means for data collection for GDP estimation, needs a re-examination. Also, the employment of these surveys as an alternative system to the failing Administrative Statistical System will divert attention from the solution of the real systemic problem of the decentralised Indian Statistical System.

14.3.18 Without any real effort to improve collection of data or their quality, the second measure of computerisation and application of Information Technology is likely to result in quick processing of data deficient in quality, coverage, timeliness, accuracy or precision. The real apprehension is that the desirable flow of information via the route: Reporting unit \* State Statistical System \* Indian Statistical System will be replaced for the sake of management efficiency by a 'fly-over' approach: Reporting unit \* Indian Statistical System.

14.3.19 That there is a great need for training of statistical personnel goes without saying. However, one must distinguish here between two different types of training. The first type of training is at the operational level on standard or routinised methods of data collection, processing and summarisation. This kind of training is best given at the work site. A large majority of statistical operatives in India are university graduates, and short in-service type of training is all that is needed. It is the second type of training — training on statistical

methods to improve the practice of statistics [that] is much more important and necessary, particularly in the context of almost total lack of use of so-called 'applicable theoretical techniques' in official statistical work in India today. Centralised training is essential here, but this has to wait till a body of competent trainers is available. The immediate necessity is for training of trainers.

This appears a rather inadequate summary. In fact, in view of the involvement of the Ministry of Statistics and the World Bank in this proposal, it would have been not only desirable but also necessary for the commission to go into this proposal fully and point out its uninformed and destructive suggestions. The Indian statistical system is not meant only or even mainly to provide data for calculation of GDP and meet the needs of international bodies like the IMF and the World Bank. Its basic purpose is to help the administration in monitoring the effects of its policies and formulate policies and help the public as well as scholars in understanding the economic and social situation. The data are not only to be routinely collected to serve this purpose but also should be so processed for publication that administration can directly or with the minimum of arithmetic manipulation get information that is directly relevant in policy formation. As a British governmental advertisement required, the state statistician should also be able to anticipate the type of data and

the methods of their collation and presentation which can help administration in this direction create demand and not merely supply. The commission has later noted that quite often tabulation appears to be for the convenience of scholars rather than of the administration. There is no understanding and appreciation of this in the Modernisation Project of the ministry and the World Bank.

It is fortunate that the commission has ruled out the basic approach of this document, and stressed the need to revive and strengthen the decentralised system which at one time was the strength of the Indian statistical system. The commission has recommended:

14.3.20 It is understood that the project is under review by the MoS&PI. While reviewing and reformulating it, the MoS&PI should consider the recommendations made by this commission on the various subjects and the components of the project may be modified accordingly, if necessary. For this, the project will have to shift its focus from expansion of sample surveys to improvement of the systemic issues of the Administrative Statistical System. Modernisation may be considered as a means for that purpose. It should also keep in view the essentially decentralised character of the Indian Statistical System and ensure that the States' Statistical Systems are interwoven in the project architecture.

These recommendations are phrased in a guarded manner, giving rise to a suspicion that if the commission had the full

proposal at its disposal it would very likely have been more forthright and sharp. Nevertheless, it is to be hoped that the government will read the recommendation carefully and take steps to restore and improve the vigour of the decentralised statistical system of India.

In order to facilitate proper coordination and render technical help and advice to different agencies in the field, the commission has made a whole series of recommendations. During the 1990s the Ministry of Statistics appears to have usurped some of the functions of the CSO. The CSO did not have any one at its head director general since 1997! The Conference of Central and State Statistical Organisations (COCSSO) which was designed to meet once every two years to discuss various technical aspects and take decisions had not met even once since 1992 until this commission requested its meeting for discussions! The Governing Council of the NSSO which is an autonomous body for technical direction and decisions was sought to be ciphered. The Economic Survey is the responsibility of the Ministry of Statistics and not of either the CSO or the NSSO which carries out the field operations.

### **National Commission of Statistics**

To restore proper technical direction and coordination, the commission has made a number of useful recommendations. It has proposed establishment of a National Commission of Statistics (NCS) by an Act of Parliament. The NCS shall serve as a nodal and empowered body for all core statistical activities in the country, evolve, monitor and enforce statistical priorities and standards, and ensure strong coordination through closer linkage between statistical programming and budgeting. Core Statistics are defined as those that are of national importance. It will be mandatory for the government at all levels to collect and disseminate them. The definitions, standards and concepts for this are to be laid down by the NCS which will also decide on both periodicity of collection and on degree of disaggregation for publication. In deciding these matters, the NCS shall keep in view the decentralised nature of Indian statistics where the national statistics are merely aggregations of state level statistics. In advising on core statistics, the NCS would keep in view the optimum use of national resources, that is the resources of the centre and the states. The states shall be free to directly approach the NCS on all matters relating to statistics. Indeed, the objective, or what is called the Mission Statement of the Indian Statistical System shall be "to

provide, within the development structure of the system, reliable timely and credible social and economic statistics, to assist decision making within and outside the government, stimulate research and promote informed debate relating to conditions affecting people's life".

The NCS shall have a chairman and four expert members, who shall be distinguished statisticians or social scientists, with the rank of at least secretary to government and shall work part time, since it will be essentially a policy-making body not burdened with routine administration. It shall work with the help of nine technical committees relating to different fields. Its secretary shall be the Director of the National Statistical Organisation.

The National Statistical Organisation (NSO) will be the remodelled present Department of Statistics. Its head, with the rank of a Secretary, shall be called the National Statistician. He shall not be from any organised service of the government of India, but shall be recruited by open selection from among professional statisticians with long technical and managerial experience in large statistical organisations. With this recommendation, the commission has designed a competent statistical department headed by a distinguished statistician to carry out the policy decisions of the NCS.

The NSO shall have four operating offices, the Central Statistical Office (CSO), the National Sample Survey Office (NSSO), Data Storage and Dissemination Office (DSDO), which are currently in existence with slightly different names, and a new fourth one, Consultancy Wing (CW) which will cater to the increased demand for professional statistical services, specially from the government. To help lateral coordination with the various government departments, there shall be Statistical Advisors in such departments, a rank below the National Statistician, who will be chief nodal officers relating to statistics in those departments, and coordinate with the NSO in carrying out the guidelines of the NCS. The tasks of these offices are also specified.

The commission has recommended that the implementation of its recommendations in these regards should not wait for the constitution of the NCS. The activation of the CSO with a properly appointed head, the National Advisory Board of Statistics and the Governing Council of the NSSO, the Advisory Committee on National Account Statistics and other technical committees should be fully constituted and allowed to function and the recommendations relating to the so-called Modernisation Project implemented, pending action on the organisation of the NSO.



### States' Statistical System

In reviewing the states' statistical system, the commission notes two main factors responsible for the serious decline in the proper functioning of the routine statistical data collection by the ground level officials of the government. The first is the overburdening of this staff with various types of work, both ad hoc data collection and other administrative work, and the second is the general running down of administration in the states. The commission has recommended that time should be set aside for the concerned ground level staff to devote itself exclusively to its routine record-keeping and administrative data collection at appropriate times of the year.

As for administrative revival, the commission has drawn attention of the state authorities at the highest level to stem this tide. It warns the states by saying, "The governments should appreciate that the Administrative Statistical System (AdSS) is the prime responsibility of the state governments and the entire structure of the Indian Statistical System is founded on its basis, that the AdSS is presently in a state of collapse in certain sectors, and that the effects of this collapse will not be restricted to particular states but will affect the completeness and quality of national statistics. They have to take

urgent steps to remedy the situation by resolving administrative problems in some cases and toning up the administration in others." The commission further warns the states: "The states have played a dominant role in building the National Statistical System known for its soundness all these years. Inaction by the states about the AdSS will gravely impair the national system. That will necessarily lead to a creation of alternative systems by the central government, which will be centralised, and will produce statistics which the states will have to accept in place of those they have failed to generate from their own systems. The states will thus lose power over the field of statistics, which belongs to the Concurrent list of subjects in the Constitution." This is a grave warning. However, the commission could have added that no sample survey conducted by all-India institutions can be a substitute to the detailed complete information on many matters that are collected as a part of administration. With decentralisation of powers and functions to the local authorities, all-India sample surveys will be of little use.

The commission has recommended parallel organisational form and coordinating function for the Director of Economics and Statistics the State Statistician in the states. The commission makes the very thoughtful suggestion that "To succeed in raising his status and

that of statistics, the State Statistician's job should, therefore, be that of enhancing both the demand for and the supply of statistics and their analysis. The 'mission' of his office should be to improve decision-making of the government by providing quality statistical service." The commission notes that statistics are needed at the micro level "for operational planning where disaggregated statistics are more relevant and therefore important... A very important characteristic of the statistical requirement for state government decision-making is that, of the two main types of statistics, the average or the total and the distribution, it is the latter that is more frequently required. This is because a state government's decision about its plans and programmes mostly relate to specific groups of people or units, needing statistical information for such groups defined in a manner relevant to the plans and programmes. Generally, the information is required urgently. The statistician must accept the challenge, for it is only on such occasions that the administrators come in meaningful contact with the statistical system, and these occasions provide an opportunity for establishing the usefulness of the statistical system." These are very perceptive and wise observations worth every aspiring and competent State Statistician's attention. They also should tell

the formulators of the Modernisation Project where their entire scheme is grossly faulty.

The commission has made many recommendations about the statistical service and training and about the use of computers. These should provide useful guidelines to the government in the matters. Now, turning to the statistical scene in the individual sectors, the report describes the types of data collected, the methods of collection and the agency its strengths and weaknesses. In the chapter on Agricultural Statistics the commission underlines the need to free the patwari from other responsibilities in the main crop season to be in a position to record carefully the crop area statistics that has suffered badly over the years. It has suggested a 20 per cent sample reporting in this matter every year in order to ensure reliability. If its suggestion about reducing the workload and responsibility of the Patwari is carried out, sample reporting may not be necessary. Greater supervision of his work, computerisation of land records and the changes in the law and method of recording currently being seriously discussed, would surely help the Patwari in reliable reporting of primary land data in years to come.

### Neglect of Agricultural Data

The commission, unfortunately, seems to have paid scant attention to some aspects of data gathering in agriculture that deserved careful scrutiny. Since 1972 the Ministry of Agriculture has been conducting cost of production surveys routinely every year, on sample basis for different crop regions in different states. The annual cost compares with the cost of the NSS. But the report only briefly describes and endorses this. The ostensible purpose for which these data are being collected is to help the Commission of Agricultural Costs and Prices to formulate its proposals on support prices for individual crops. No attempt has been made to examine if this purpose is being served and can be properly served. But, that apart, no note is taken of the fact that, while these surveys collect complete farm input data as well as the farm household's labour disposition for all the sample households for every day of the year, only the input data relating to the particular crop, on the basis of which the sample is drawn, is tabulated. The vast body of data collected relating to all the other crops grown by the farm household on its land during the year, the labour time disposition of the members of the farm households, the livestock economy of these households, are not even entered into the computer, much less made any use of. There is no parallel in the Indian

statistical scene of this dimension of wastage of basic socio-economic information collected on such large scale at such great cost. This to my mind is a serious lacuna in the report. The matter becomes worse when one finds the commission endorsing in just one sentence the need for a Farm Management Survey on a regular basis! The least one can hope for at the moment is that this must engage the attention of the NCS before it is put on the ground. Our resources are not so plentiful as to be spent so recklessly.

The suggestions of the commission to change the base of the Consumer Price Index for Agricultural Labour and Rural Labour every five years, in view of the quinquennial consumer expenditure survey by the NSSO, is most welcome. A similar index for the urban population, for different expenditure groups if necessary, would also be a useful device. The commission has drawn attention to the inordinate delay in revising the base year of the price indices at present. Understandably, the matter has been left to the special technical committees already in existence.

The same may be said about the recommendations relating to many other fields. Reference in passing was made above to the collection of vital statistics, shops and establishments, etc. The

chapter on National Accounts presents a comprehensive description and analysis of the present data base, shortcomings and the need and methods to overcome them.

The Report of the National Statistical Commission is a most welcome report which seriously proposes to stem the rot that has set in the field of Administrative Statistics that is the basis of most socioeconomic statistics in India. It has wisely rejected the Modernisation Project of the Ministry of Statistics and the World Bank. It has outlined what

amounts to an independent professional set-up at the highest level to lay down the policy in the field of Central and State Statistical System. It has underlined the need for state governments to treat their administrative data reporting agencies as useful agencies for the purpose, since without this data base the government will be blind about both formulation and monitoring of policy. The missing and inadequately treated individual items should deserve the attention of the NCS, which should be expeditiously established by the government.

## **Perspectives: D R GADGIL ON COOPERATIVE COMMONWEALTH\***

Nilakantha Rath

*The cooperative system that was put into operation in the country as a result of the recommendations of the Committee of Direction of the Rural Credit Survey in the middle of the 1950s has, after a couple of decades of positive results, run into difficulties and steadily declined. Many administrators and others in discussions blame that committee and D R Gadgil in particular for the scheme where the state was made a partner in the cooperative enterprise, resulting in rigid mechanical procedures, heavy subsidies - overt or implicit - and bureaucratisation on the one hand and politicisation on the other. How objective and fair is this assessment?*

The economic development of India was the central focus of Dhananjay Ramachandra Gadgil's intellectual pre-occupation right from his student days in Cambridge. His dissertation for the MPhil degree there was on Industrial Evolution in India. Within a year of his return to India he entered the academic profession and stayed in it till the very end. Right from the beginning he pursued empirical enquiries into different aspects of the Indian economy that he thought will give a sound base for the understanding of the working of that economy and will enable advocacy of necessary institutional devices and useful policy measures. Early in his career he began empirical investigations into different aspects of the farm economy, small and household rural and urban industries and transport. One of the institutional devices that attracted his attention early was the cooperative form of organisation. In this

he was, of course, following the foot steps of several distinguished public men of his region beginning with Gopal Krishna Gokhale. During 1937 to 1942, and again during 1946-48, he became member of the board of directors of the Poona District Central Cooperative Bank and was its chairman during 1947-48.

The cooperative as an institution started in India under state initiative and patronage. Following Nicholson's report in the 1890s of the 19th century, a legal framework for this institution was laid in 1904, under which an official in every region was designated as the registrar of cooperatives. In most provinces and presidencies it was these officials who took the initiative in organising primary cooperative societies - mainly for credit - in which the maximum activity was in the Punjab. However, in the two presidencies of Bombay and Madras it was

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\*Source: *Economic and Political Weekly*, Vol. 37, No. 14 (Apr. 6-12, 2002), pp. 1323-1329.

the local leadership of informed and far-seeing public men that helped form cooperatives. Consequently, these institutions were more often at the provincial and district level, the so-called apex and secondary level. Alid these institutions often took the initiative in promoting and organising primary societies.

Against this background, Gadgil did not think that cooperative credit institutions could be expected to undertake the massive task of both mustering deposits and providing loans to farmers and household industries in a changed economic situation. The second world war had pulled the rural economy out of prolonged depression into one of growing demand and inadequate supplies to meet it and into the need for increased investment and working capital for the farm sector. In 1944 he was invited to chair the Agricultural Finance Subcommittee of the Agricultural Policy Committee of the government of India for Post-War Reconstruction plans. The committee reported in 1945. It stated that increased credit needs of agriculture cannot be met by regulating money lending and encouraging the cooperatives. The only way to undermine the monopolistic position of the village moneylenders was to provide a competing source of credit for the credit worthy farmers. It, therefore, recommended

creation of a number of semi-state Agricultural State Credit Corporations in the country (p 13).

Gadgil and the committee which he chaired did not think that in the light of the very uneven development of cooperatives in India these institutions can be expected to file the bill. Moreover, the general thinking and advocacy was that cooperatives are independent bodies that are free to decide on the scope and manner of their operation. Since they cannot be made to fall into a plan, they cannot be expected to undertake a planned provision of universal rural credit. However, the committee stated that if in any region existing cooperative institutions decide to fall in line, they may be entrusted with the responsibility.

No province in India took the recommendation of the committee seriously. The Bombay Provincial Cooperative Bank, in which Gadgil was a director in 1946, however, did not relish the sidelining of the cooperatives by the committee. Under the leadership of its managing director, Vaikunthalal Mehta (a very great name in the field of cooperation in India), the bank reorganised in 1948 the entire cooperative credit structure from the primary to the apex level and the methods of assessment of credit need, advancing of loan to and

recovery of loans from creditworthy farmers in a manner that would facilitate a planned expansion of rural credit.

Soon after this, the newly established Planning Commission began formulation of the First Five-Year Plan. This was largely a plan for agricultural development. The Reserve Bank of India, which had special responsibility relating to rural credit, called a meeting of the leading cooperators from Bombay and Madras presidencies to discuss the approach to reorganisation of rural credit. The meeting resulted in the initiation by the RBI of the Rural Credit Survey under a Committee of Direction consisting of A D Gorwala as chairman and D R Gadgil and Venkatpaiah as members.

The recommendations of this committee formed not only the basis of rural credit in the second half of last century but also determined the character of cooperative organisations in India. The committee did not accept the recommendations of the Agricultural Finance Sub-Committee of 1945. Instead, it stated that "cooperation has failed, but cooperation must succeed". It followed the pattern of reorganised cooperative structure adopted by the Bombay Provincial Cooperative Bank. The three-tier cooperative structure, with the primary credit (or multi-purpose) society at the village level, the central cooperative bank

at the district level and the provincial or state cooperative bank at the apex level was suggested for universal application. The primaries were to be basic institutions with cultivators, including tenant cultivators, as members. The share capital as well as the deposits of the primaries were to be supplemented by the advances from the central cooperative banks, which in their turn were to receive the bulk of their advances from the provincial cooperative banks. Ultimately the Reserve Bank of India was designed to provide the short term production credit to this three-tier system. The same system was to be followed by the Land Development Banks which were to provide the long and medium finance to farmers. The Reserve Bank was to lay down the procedure for assessment of production credit need of the farmers. A most important departure was the assessment of loan on the basis of production performance, not on the basis of security of fixed asset like land. The loans were to be advanced on the eve of the kharif and rabi seasons and recovery was to be scheduled within a relatively short period after the post-harvest marketing season began. There was provision for postponement of repayment due to poor harvest caused by adverse weather or widespread pest attack. The committee also recommended creation of a central fund for writing off difficult loans due to prolonged crop failure.

There is no doubt that during the 15-20 years since the implementation of the recommendations of the R C Survey Committee, the significant growth in agricultural production in the country was greatly facilitated by the inflow of production credit through this reorganised cooperative credit structure. In fact, this structured system of cooperative institutions along with public funds in very large measure supplementing the own resources of the members came to characterise the cooperative endeavours in other fields of agriculture, like marketing and processing.

Without belittling the contribution of others to the development of this policy, it would not be unfair to say that Gadgil had a large role in the formulation of this policy and was a consistent champion of it. The working of this institutional structure gradually came under strain after the nationalisation of the commercial banks and their extension into the field of rural credit, Gadgil had also noted problems in the way the cooperatives were working and began suggesting changes. But before I turn to these, it is necessary to recollect his contribution to the evolution of cooperative processing in the field of processing of sugarcane.

### **Cooperative Sugar Factories**

Promotion of sugar factories in the perennially irrigated areas of the Deccan had been a part of government policy in Bombay right from the 1920s. The depressed condition in the 1930s enabled the sugar factories, both old and new, to make good profit by taking land on lease from farmers at very low rates for growing sugarcane. The second world war saw a great improvement in the price of cane. Farmers thought new sugar factories will help them to get good price for their cane, particularly because of the wide fluctuation in the price of gur (jaggery) in the previous two decades. In a meeting convened by farmers for the purpose in Srirampur, Gadgil put forward the idea of a cooperative sugar factory of the sugarcane growing farmers. The farmers took up the suggestion seriously. When they approached the Provincial Cooperative Bank for help and advice, Vaikunthabhai Mehta said that if they could persuade Gadgil to be the chairman of the cooperative factory, it would greatly help matters. This is how Gadgil came into this picture.

The history of this first cooperative sugar factory of farmers (indeed, the first producers' cooperative factory) in India is well documented. What I wish to draw attention to here are a few facts that are relevant in the context of later-day



developments in this field. It is important to remember that Gadgil had a very important role in the basic formulation of rules and procedures and in persuading the farmers in this direction. The share capital of member farmers was fixed at Rs 500 per acre of sugarcane, subject to a ceiling of Rs 10,000 (subsequently relaxed to Rs 15,000 for the directors) for any member. Other cooperative societies alone could be the non-farmer members. But, since the paid up capital in the beginning came to just 2 lakh rupees (despite the fact that many farmers had to sell their utensils to subscribe to the share capital) the cooperative approached the Bombay government for help. The government (in which Vaikunthabhai was then the finance minister) made an exception in this case of the first such venture by agreeing to subscribe up to six lakh rupees of share capital on a matching basis with the members. This was to be redeemable. With this help the cooperative approached the Industrial Finance Corporation of India, of which Gadgil was then a director, for a loan of 20 lakh rupees to put up the plant by mortgaging its land, buildings and machinery (without any underwriting by the state government). A last minute shortfall of Rs 6 lakh was met by the Provincial Cooperative Bank against the security of the personal properties of the farmer members of the board of directors. The factory started production in 1950. The

farmers were paid a good price for the sugarcane a price that was fixed after deducting the loan instalment and interest payments, and after making provision for depreciation and reserves against contingencies, and paying a 3 per cent dividend on the capital. The government's share capital was redeemed within 10 years. The society not only saw the members pay up the entire amount of the share capital subscribed by them from the value they received for their sugarcane but make compulsory deposits with the society that was used to buy up the government's share capital when this was redeemed. Within a decade of its functioning the society was free of government's share capital as well as the loan from the Industrial Finance Corporation.

This successful cooperative enterprise led the state and the central governments to make a policy decision to permit henceforth only farmers' cooperatives in the field of sugar manufacture in the country. Gadgil was closely associated with the decision, and was for a while president of the All-India Cooperative Sugar Factories Federation.

From around the middle of the 1970s (by which time he was dead) the situation in the cooperative field began sliding down. In the 1990s, innumerable primary cooperative credit societies were virtually nonfunctional because their credit

lines were choked due to non-repayment of loans by borrowers. Even many central cooperative banks (at the district level) were in a moribund state for the same reason. The commercial banks which came into the field of agricultural and rural credit after nationalisation had supplanted the cooperatives with more than half the total term loans, and nearly 40 per cent of the short-term credit or what is known as crop loans. Governments at the state level began stepping in with financial and administrative help, including takeover of the management of central cooperative banks from time to time.

The cooperative sugar factory situation is at least as bad or possibly worse. Out of the 116 cooperative sugar factories in Maharashtra in 1998 only 19 were making profit, and the remaining 97 were incurring loss. The accumulated profits of the profit-making factories was about two crore rupees only whereas the accumulated losses of the 97 loss incurring factories was nearly 700 crore rupees. It is an irony of fate that the first cooperative factory which under Gadgil's stewardship had cleared all loans and government shares and built up a surplus of 1.2 crore rupees, is today showing accumulated losses. The state government is heavily involved financially in these factories. The government finances 32.5 per cent of the original appraised cost of the project

in the form of share capital. Compare this with the 14.6 per cent in the first cooperative sugar factory with which Gadgil was associated. The state has guaranteed the loans from financial institutions to these factories; this amounts to 60 per cent of the total appraised cost of the factories. In the case of the first cooperative factory there was no such guarantee and the loans from financial institutions amounted to 63 per cent of the actual total capital cost, all against mortgage of the property of the factory and personally of the farmer directors of the society. In addition, the state in Maharashtra has given special loans as 'Last Mile Assistance' to many of these amounting to another 2.5 per cent of the estimated total cost of the factory. Unlike in the case of the first factory, the present factories have paid no dividend on the share capital contributed by the government; this would amount to 16 per cent of the estimated cost. In addition, there is the huge amount of purchase tax on sugarcane unpaid to the state. The state government which came in with some financial help in the beginning (recovering all dues within a decade) is today continuously funding and subsidising these cooperative enterprises [for details see Wadhwa 2000].

### Cotton Marketing Scheme

Turn to another such effort in the marketing field. Gadgil strongly championed the case of monopoly cooperative marketing of jowar in 1964-65 in Maharashtra. He thought that "The guaranteeing of a support price to all cultivators in all areas and procurement of grain from farmers are detailed operations of an order which it is impossible to contemplate by any central ministry or the Food Corporation undertaking in each state" (p 137). He also visualised that in the long run "as compared with the operations of government departments, the fullest cost of operations including all the overdues have to be borne by the cooperatives". He expected the cooperative marketing effort to be less expensive. The Maharashtra experiment, started under severe scarcity conditions, was soon given up by the government. But a very similar enterprise was launched in 1974 in regard to cotton which continues till today. This is, like the earlier jowar marketing, operated by the Maharashtra State Cooperative Marketing Federation, and all the primary marketing cooperative societies operate it in their respective areas. The state government announces support prices for various types/grades of cotton, the primaries at the marketing centres grade it, weigh it, gin it and the Federation markets it to spinning mills and exports. An

announced price is paid to the growers at the time of sale, and after the year's sale is over, the surplus is also distributed to farmers.

During the last 26 years the Federation has received a cumulated subsidy of more than 4,000 crore rupees from the state government. A study conducted a decade ago had shown that only in the first three years the producers in Maharashtra had received a final price for many of the varieties grown in the state that was higher than the most common prices for such varieties paid to farmers in the auction floors in the regulated markets in the neighbouring states. In all other years, the final prices paid in Maharashtra were lower. The cost of marketing the cotton by the Federation varied from 14 to 18 per cent of the gross final sale value of cotton. I am reminded of M L Dantwala's study into the marketing of cotton in Khandesh districts of Maharashtra in the early 1930s in which the traders were doing business at an average margin of 2 per cent of the gross value of cotton sold.

A cooperative system that was put into operation in the country as a result of the recommendations of the Committee of Direction of the Rural Credit Survey in the middle of the 1950s has after a couple of decades of positive results, run into difficulties and steadily declined. Many administrators and others in discussions

blame that committee and Gadgil in particular for the scheme where the state was made a partner in the cooperative enterprise, resulting in rigid mechanical procedures, heavy subsidies overt or implicit and bureaucratisation on the one hand and politicisation on the other. I think it is necessary to be objective and fair in such assessment.

It is necessary to recollect the economic and social situation in rural India when the RCS recommendations were formulated. The agricultural economy was very poor, with little surplus in the rural area for investment. Rural savings were hardly 6 per cent of total income generated in agriculture. The village moneylender was the main source of loans. What was visualised was massive extension of credit particularly short-term production credit for agricultural development. The RCS visualised the bulk of this short-term credit to come from the Reserve Bank of India. I remember hearing serious concern expressed by senior officers of the Reserve Bank about the injection of such funds amounting to an estimated 900 crore rupees a year on the country's monetary and price situation, particularly if the money did not generate the requisite production and was not returned to the banking sector in time. Since the funds were external, not belonging to members of the cooperatives, it was considered

absolutely essential to design mechanism for proper assessment of credit needs, their timely advance and repayment. The cooperative system in most states, excepting three, was not equipped to handle this on its own. Hence uniform centralised procedures and rules were formulated for the purpose. Scarcity of investible funds in the rural economy and the near monopolistic position of the moneylender on the one hand and the large proportion small farmers with inadequate assets for security on the other led to very high interest rates. Gadgil wrote and spoke repeatedly to stress that in such an economy, unless the state comes forward in a significant measure, the cooperative credit system simply cannot pull itself up with its boot-straps. Indeed, the role of the state in the development of the Indian economy at this stage was emphasised even by those who were not socialists or cooperators, as can be seen from the approach of the Bombay Plan of the industrialists in the late 1940s.

### **What Went Wrong?**

That in the field of rural credit in the main, and to a lesser extent in processing industry, this approach paid good dividends, cannot be denied by even the worst critics of the system. Then, what went wrong?

Basically, policies which were designed to subserve a very poor inexperienced state of the economy and farmers, needed to be changed as the economic situation improved. It was not necessary to wait for the situation to change for the better everywhere before making changes. That needed to be done wherever the change had taken place. But official policy and thinking did not move in this direction. Instead it hardened further. First, the interest rates were made steadily relatively lower. In the middle of the 1950s interest charged of the borrowers was 6 per cent, which was more than twice the Bank rate, though way below the interest rates charged by money-lenders. But by the 1980s the interest rates were near the Bank rate, and in some exceptional cases it was way below the Bank rate. The real rate was near zero. Since lending rates were kept low, the rates on deposits had to be much lower. With nationalised banks spreading in rural areas, they could attract deposits from rural areas with their better interest rate on term deposits. The policy of charging low interest rates on agricultural loans was carried to a ridiculous extent. For example, not only were farmers given loans to cover 90 per cent of the price of new tractors to be purchased by new owners at low interest rates, but even for replacing the old tractor the same policy was persisted in. Such policy resulted in farmers using such credits to the maximum, but not put their own money in the form of deposit with cooperatives and diverting it to other nonfarm investments and deposits in commercial banks. Indeed such low interest rates were one incentive for non-repayment of loans. The other was the populist measure not only in the states but also by the central government of writing off agricultural loans and interest dues across the board. Borrowers expected this to happen periodically, and therefore did not wish to be foolish enough to repay loans. Not surprisingly, the cooperatives became avenues of providing only external funds at a cheap rate to borrowers, with little stake of the members in the proper functioning of their societies. This was a sign of not growingly self-dependent cooperatives but declining ones. Gadgil had visualised greater state participation in the cooperatives in the context of the poor agricultural economy dominated by small cultivators. Improvement in agricultural production and income was expected to lead to the withdrawal of the state and external funds. What happened was exactly the opposite. Even in very developed agricultural states the rural branches of commercial banks often had more deposits than advances, while the primary cooperative credit societies depended mainly on advances from CCB's and the NABARD, indicating enough rural savings that were not being

made available to the cooperative system. And this was the result of state policy and action.

Secondly, the uniform pattern of assessment of credit needs and the rigid seasonal pattern of extension of credit and its recovery was leading to problems with cultivators who for both production and marketing purposes and household expense felt the need for deviating from the rigid pattern of repayment. Gadgil felt that the problem of overdues arising with such farmers can be overcome by resorting to a system of cash credit where complete repayment at any time may not be insisted upon. These and other related problems pointed in the direction of supervised credit (pp 105-15). Gadgil drew attention of the government, the RBI as well as the cooperators to these needed changes by the middle of the 1960s. But little action was taken in this direction.

Thirdly, after 10 years of working of the new system of cooperative credit, Gadgil thought it was time the different states/ regions tried out variations depending on local conditions. He had illustrated this need by mentioning the possibility of the central (i.e., district) cooperative banks functioning as the direct suppliers of loans to farmers while at the same time trying to nurture primaries in suitable situations, in regions

where the primary set up was very weak or largely non-existent. This was a matter that needed formulation and action on part of the local cooperative leaders as well as the officers of the Reserve bank of India. But this never took place in any significant measure. Gadgil was clear that it is impossible to lay down it is in fact dangerous to lay down hard and fast rules about the size of a society. While on the one hand there is need for a local organisation in which knowledge of operations of the individual operators assumes importance, a certain turnover is essential before a primary credit society can operate efficiently. Large size, he argued, is not an objective in itself but, excepting in the poorest and most backward areas, viability is or should be. He argued that multi-functional cooperatives are not particularly efficient. The nonviable farmers and labourers needed different types of cooperatives in order to make themselves viable and improve their economic situation. All this pointed in directions very different from a single large village society. But this was never followed. On the contrary, governments made all villagers members of the village society by paying the basic share capital on behalf of the small and marginal farmers and agricultural labourers. Not surprisingly, no useful purpose was served by this gesture.

## Self-Help Groups

Much later in the day, following the example of the Bangladesh Grameen Banks, self-help groups of the poor got organised in rural and urban areas, which pooled their little savings and by group supervision and judgement provided small loans to their needy members for both consumption and production/trade purposes. By their very nature these were small cooperative credit societies, though they could not be registered as such since that would go counter to the one-village one-society rule! It is instructive to note that NABARD found a way of helping them with additional loanable funds though they were not primary societies. The rate of interest charged by most self-help groups on loans to their members is at least 25 per cent a year (two paise on a rupee a month). This is not dictated by any outside agency, but decided by the members themselves. There is much better assessment of credit needs and supervision of credit. The repayment performance is nearly hundred per cent. While same external finance to such groups can be very useful, the external financing agencies can ruin these self help groups by providing funds at much lower rates of interest and by flooding them with funds at such rates. But this is the approach of the NABARD

today. This will be a sure method of the self-help groups going the way of the primary cooperative credit societies.

The easy and excessive access to and dependence on cheap state funds have also been the cause of ruin of the marketing and procuring cooperatives, as seen in the case of the cotton marketing and sugar mills in Maharashtra. While advocating some help for enterprises of the economically poor or for enterprises needing very large capital, Gadgil tried to keep it to the minimum and endeavoured to free the cooperative of such help as fast as possible, ultimately depending on the members own resources and the surplus of the enterprise. That such marketing and processing cooperative enterprises can prosper is best exemplified by the Kaira Milk Producers Cooperative Union (AMUL).

Gadgil's study and understanding of the Indian rural economy and his experience with the working of cooperative institutions in Maharashtra led him to conceptualise and formulate a cooperative commonwealth for India mainly but not exclusively for rural India. His ideas in this respect are contained in two of his writings one, 'Towards a Cooperative Commonwealth', delivered as Professor Brij Narain Memorial Lecture in the University of Punjab in 1960, and two, 'Reflections on a Cooperative Social

Order', delivered as the Vaikuntha L Mehta Memorial Lecture in the Bombay Gandhi Smarak Nidhi in 1965 (pp 3-71, 145-57).

Gadgil began by stating that "cooperative societies must be looked at essentially as business organisations and must be primarily designed and constructed to carry out particular business activities. They ought not to be confused with the purely political or administrative organisations like panchayats" (p 37). This raises the question of the control of the cooperative in a democratic manner, each member having one vote. Gadgil thought that such a principle in a business organisation may have the result of minimising the influence of the rich and prevent concentration of control, and may have no adverse effects so long as the membership is fairly homogeneous. However, in situations with conflicting interests this would create problems. If the state takes considerable initiative and gives assistance, it may have some power of supervision. I think, while conflict of interest may not be there, it is possible that greater voting right to those that have a greater stake in the efficient running of the enterprise may not adversely affect the interests of the others but promote it. By 'stake' is implied not more contribution of capital but greater patronage or participation in the work for which the cooperative is formed. This would,

however, imply that the voting right shall be bestowed on those who participate in the designed activity of the cooperative, in proportion to their participation (or value of participation plus share capital contribution). Such members who contribute only share capital but do not participate in the activity of the cooperative shall have no voting rights. Since the patronage can change from year to year, a three-year moving average may be a good basis for such voting rights.

### **Open Membership**

Gadgil was more explicit on another traditional principle of cooperation, namely, the principle of open membership. While originally this was devised as a measure to ensure political and religious neutrality, Gadgil noticed several difficulties created by this principle. If a society is formed by people who know each other's business, character and interest and therefore agree to unlimited liability, open membership may not be acceptable and convenient. Nor can persons whose activities are in competition with that of the society and its members be welcome members of the institution. Gadgil mentions, as illustration, the possibility of a consumer cooperative accepting open membership. I think, the matter is rather complicated. The shop space may be grossly inadequate to accommodate and serve an unlimited



number of customers. If space cannot be expanded, membership and patronage has to be limited. Indeed, the reason why people agree to come together in a cooperative to carry out a given task or operation is that it will minimise the cost to them or maximise the return to them from this task. But as the volume of business of the enterprise increases beyond a certain total volume, the per unit cost of carrying out the work (average cost) will increase. This will reduce the benefit per unit of service to the members. In fact, unlike a private operator or a joint stock company which tries to maximise its total producer's surplus (or rent or profit), a cooperator is interested in maximising net surplus to him per unit of output or service. This is achieved at a lower level of total output or service than in case of a private or joint stock firm. This is a clear case against open, unlimited membership of a cooperative.

All this, and some other situations cited by Gadgil where the state may use a cooperative to discharge a social task, lead to severe limitation of this open membership principle. Even the apparent residual consideration of preventing discrimination in membership on ground of religion or political views does not appear to be a safe reason. Gadgil cites many societies in India explicitly confined to members of a caste or community, and some of these worked well. "...it

has to be remembered that cooperative organisations exhibit, in the main, characteristics of the social milieu of which they are a part" (p 47), he said. This is consistent with the growth of self-help groups in villages and towns. But these are not recognised as cooperatives as yet, since more than one cooperative in a village is yet not permissible.

A third basic principle of cooperation is distribution of the surplus according to the participation of members. Since a cooperative is a mutuality of members and not a separate company the surplus net of costs, depreciation, interest and reserves, is treated not as profit but as the income of the participating members in proportion to their participation. There is usually an upper limit on the rate of dividend to be paid on the shares. Gadgil, while recognising the universality of this principle, thought that it may vary in importance with the type of cooperative. This would be significant, for example, in consumer, marketing and processing cooperatives, but not as much in credit societies, he said. True, the magnitude may not be as large in case of banking. But it cannot be negligible. The situation prevailing at the time Gadgil was writing indeed, up to the early 1990s was one that justified his proposition. The registrar of cooperatives in every state had put a ceiling on the dividend that can be declared by cooperative banks rural and

urban. The Reserve Bank had fixed the rates of interests on both deposits and borrowings, with no more than token gifts permissible. The result was that the substantial surplus of many urban cooperative banks, besides increasing their reserves, went to their employees. But with abolition of administered interest rates, the cooperative banks can distribute their surplus to their borrowers and depositors in the form of bonus payments. Besides serving the interest of its members, it can give the cooperative banks and even credit societies a competitive advantage *vis-à-vis* the commercial banks.

There is one related question in this context to which Gadgil had drawn pointed attention. It relates to income generated by cooperatives from activities not related to members' dealings. One aspect of this relates to income generated through handling the business of non-members - be it in consumer or marketing or processing or service cooperatives. While in many such types it may not be possible or advisable to refuse to deal with non-members, a straightforward approach is and has been to ask such parties to become members by subscribing to share capital at the end of the year of operation. If there is a policy of distributing the surplus on the basis of patronage irrespective of membership, it may be easy for the non-members to

become members at the end of the year. Otherwise, transitory users apart, the larger the volume of transactions of non-members who are not beneficiaries of the surplus distribution, the further the institution will move away from the character of a cooperative. This is a problem - in the form of nonmember sugarcane growers plaguing the sugar cooperatives in Maharashtra [Wadhwa 2000]. The situation will not be very different if a fertiliser factory owned by farmers' cooperatives sells the larger part of its product to non-members. The solution to this is straightforward and simple. It would, therefore, be useful to find out how many cooperatives are accumulating and distributing surplus from non-members, thereby gradually acquiring the character of a joint stock company.

The other aspect of income generation to which Gadgil drew attention was the cooperative organisation or organisations entering into activities that had nothing to do with the business of members. Examples are like milk cooperatives producing and marketing through their usual channels bread and other bakery products, cooperative sugar factories having large poultries, agricultural processing cooperatives owning a chain of petrol pumps, etc. Gadgil mentions the classic case of the Histraduct (the General Federation of Labour)

in Israel which has enterprises in the field of building industry, finance, even heavy industry. It is better referred to as 'labour economy' than cooperative economy (pp 53, 147, 231). It is not possible to justify such enterprises as cooperative enterprises.

### **Gadgil's Vision**

In fact, this is an appropriate stage where one tries to understand Gadgil's vision of a cooperative structure. Let me quote him at some length, for I cannot do any better:

In building a logical cooperative structure, what are the elements with which one works, the elementary principles? This, you will see, is an extremely ticklish problem, because you have to extract from the history of cooperation, from the writings and thinking on cooperation, what appears to one to be the more essential things and leave out what appear to be the more adventitious, historically accidental and so forth. In this search I think it is appropriate to begin with considering cooperation as a device, a measure, means or instrument which is offered to the weak and the disorganised in the society to strengthen themselves. I consider the cooperative way as essentially the way which offers to the smaller, the weaker, the dispersed units in society, the means

by which they can come together, organise themselves appropriately in relation to what you may call two important features of the modern economy. As a matter of fact, you may say that they are one, but I personally think that they can analytically be divided into two, viz, technology and scale. The smaller units fail in an advancing technology and an industrialising society to maintain their independent existence, largely because of the pressure of the efficiency of large scale operation and the technologically advanced operation. If you consider cooperation as an endeavour to retain the values of the existence of small units and yet obtain for the small units advantages of modern technology and working on a larger scale, you might get a clue to what the principles of a cooperative order are, or ought to be. You can on the basis of such an approach visualise the possibility of an entire order in which the varying units and their organisations find a proper place (pp 147-48). Therefore you have to give very considerable attention to the manner in which you build up the structure of the cooperative economy. You can think of a primary society which is small scale, and limited in its geographical area, and can thus well serve a variety of needs in a small location, may be multi-purpose.

Higher tiers in the structure have to specialise functionally (p 149). ...you cannot just call anything cooperative by merely organising a few people and having model by-laws. It must essentially pass the test of mutuality and if it has to pass the test of mutuality than we necessarily get a tier of organisations (p 149). Groundnut producers can start oil expeller cooperatives which can then get together to start more complicated industry to use their product.

Inevitably, one can also see that this approach imposes certain limitations. It is very difficult, with this approach, to get public utility concerns within the cooperative order, and it becomes very difficult to organise a large extractive industry cooperatively in which there is no possibility of separate ownership of small units (p 149).

With Gadgil's *raison d'être* of the cooperative organisation being the necessity to organise the smaller, the weaker and the disorganised in society in order to help them grow with the advantage of technology and scale, another requirement appeared to him almost unavoidable in the Indian context. He considered the financial help and assistance of the state to such primaries to give them a chance to grow and become self-sufficient. To counter the fear of state dominance of such cooperatives, he drew

a distinction between state help and state dominance. Illustrating the distinction, he stated that there can be state dominance without state help (as in India till the middle of the 1940s) and state financial help without dominance (as in the credit and processing activities in the state of Bombay in the 1950s). He said, whether state participation in the provision of financial resource of the cooperative "will lead to official domination or not depends on the tradition and temper of local officialdom and the strength and quality of non-official workers. Where the latter is found inadequate, official dominance will exist even with little or no government assistance" (p 36). In this vast country examples are not completely lacking to illustrate Gadgil's contention. A shining example is the Kaira Milk-producers Cooperative Union which was not dominated by the state in its early years when there was government assistance but was sought to be dominated much later when there was none all this largely because of the sterling character of the local leadership. Unfortunately, however, these are not in dominant numbers.

### **Politicisation of Cooperatives**

The idea behind government financial help was to enable the primary to stand on its own feet. Too much of it on two

liberal terms can create lethargy, irresponsibility and consequent stagnation. This is what has happened in a very large measure. It is not 'officialdom' in the narrow sense of bureaucracy that dominates. It is politicians in power and waiting to be in power, with their chosen handmaidens, who really dominate. Politicians decide on liberal help to primaries of the poor and the weak in the form of share capital, low or no interest and dividend, underwriting of loans from financial institutions, and bridging any unanticipated gaps. Local leadership tries to get such help and concessions through politicians in power; they in turn go out of their way to help, keeping the next election in view. Overdues are written off en masse with the help of state funds. Individual cooperatives come to be associated not only covertly but even overtly with particular political parties. In case of a change in party in power, efforts are made, through financial and other inducements and help to change the institution's political allegiance.

In cotton monopoly marketing in the state, the primary society today is completely undermined. In many producing areas farmers themselves no longer take the produce to the regulated market and collect the price. This is now done by middlemen who get it graded, weighed, collect the money and pay the farmers. In all this, higher grading, weighing is

possible for a consideration. In this cooperative marketing, cooperation is between the middlemen and functionaries. The politicians, of all hues, in the state government are anxious to get more loans for financial institutions, more subsidy from the state and higher prices for cotton, in the interest of election. As against this, the cotton marketing cooperatives in Gujarat are continuing to render effective service to their members for the last half century without any state interference and support, as Gadgil noted long ago.

This is what is now characterised as politicisation of the cooperatives in the country. Quite understandably, it has led to a growing volume of opinion in the country against any state financial and administrative participation in the cooperatives. The first law to this effect was passed in 1994 in Andhra Pradesh, under the name Mutually-Aided Societies Act, to distinguish it from the Cooperative Societies Act where government is an important partner. Slowly other states are veering round to passing similar laws to enable any cooperative that does not wish government assistance to get registered and function. It is not surprising that most of the cooperatives registered under the older Act have not changed their registration to the new Act. It will take time

and not be easy for many of them to be free from financial relations with the government.

However, this is necessary in the interest of the growth of a healthy cooperative institutional structure in the country. This is not to deny the necessity and relevance of some financial help to the cooperatives of the weak. But the consequences of the last three decades have been so undesirable and the habits formed are so endemic that some clearing of the Augean stables is necessary. Alternative methods of assistance, to start with, to cooperatives not in a financially strong resource position will have to be developed. The more successful existing cooperatives may have to come forward to help in such endeavours.

Gadgil had pleaded that in the ultimate analysis some restraint and moral values must govern the behaviour of politicians and local leaders if cooperation or any institution in this country, for that matter is to succeed. However, to that end some legal provisions might help. It would be useful to prevent any person who is an elected representative in any constitutional body beginning from panchayat to parliament to be a director (or elected office bearer) in any cooperative institutions. Any office-bearer in a cooperative must resign his position before he contests election to any constitutional body. Cooperatives should not make any

donations or other help to a political party. This will, of course, not close all avenues for politicisation of cooperatives. But it might help build a body of local leadership that will be working for the success of cooperatives per se.

### **A Lost Cause?**

The rural economic scene in India is not something to feel greatly enthused about. Even in the high production agricultural regions, like Punjab, Haryana, etc, the cooperative institutions have not come up in the manner they could have without financial assistance from the state. The primary credit societies still obtain the bulk of their loanable funds from NABARD; their deposits are not what they can be. With record rice production in the region, there are few cooperative rice mills. These could have entered into the export market as well as sell their branded produce in the domestic market. The quality of the Indian rice exported is very uneven and not always reliable. This is where the cooperative mills could have established their reputation and given their members better returns. In other rice growing states where the support price announced by the government is practically inoperative because the FCI buys, if at all, rice only from the mills, the farmers would have been better off if there were cooperative rice mills there. Gadgil visualised a whole logical structure of cooperative institutions properly diversified and tiered

because the predominantly small farmer rural economy cannot get a better deal by any other institutional device. It is now 30 years since he departed. But the situation in the country as a whole appears to have worsened compared to the institutions he was actively associated with in the 1950s and 1960s.

He had a wider vision of the economy that would emerge. He said that Adam Smith argued for a free competitive economy, as against a hierarchical economic and social structure that prevailed at the time. Laissez-faire capitalism delivered goods for nearly two centuries. But, the advantages of the competitive economic order, Gadgil thought, were drawing to a close. Large corporations were operating in the field, with trade unions and corporations deciding matters through bilateral negotiation with the state coming in when necessary. Technological development was taking place in the large corporations. Quality of the product is objectively tested, and does not have to be established in the market. In such a situation the small, the weak and the poor will need a different type of hierarchically structured economic system, where the more advanced, the higher-tiered can lend a helping hand to the weak and the lower to come up. Such a hierarchically tiered structure will have two other advantages or uses. In the first place, the relevant social policies of the government can be better implemented

through these tiered cooperatives. Secondly, the cooperatives can, through a set of moral social values, try to ensure a less unequal pattern of income distribution. That is the cooperative commonwealth he visualised.

In the present climate of globalisation, liberalisation and free competitive economy, all this might appear a lost cause. But sooner than later the big corporations, domestic and multi-nationals, will dominate the field. Lack of information and equally important, wrong information is and threatens to be endemic. Economic analysis shows the severe limitation of the competitive market in this context. Institutional devices are needed to take care of these. A structured cooperative system is likely to help here. In any event, for the Indian rural economy, there does not appear to be a better alternative available. There is still scope for Gadgil's advocacy and his vision to materialise.

#### Note

[Text of a lecture delivered at the Centre for Development Studies in Thiruvananthapuram on December 17, 2001, to commemorate the Birth Centenary of late Dhananjay Ramachandra Gadgil.]

The page references are to *Writings and Speeches of Professor D R Gadgil on Cooperation*, Gokhale Institute of Politics and Economics, Pune, 1975.

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## **Perspectives: D R GADGIL ON PLANNING AT THE DISTRICT LEVEL\***

Nilakantha Rath

*There is now very great need and scope for public sector planning in which district level planning must have a very important place. There is not only need but now a much greater possibility of transferring much larger resources to district level planning. Such plans, as D R Gadgil argued and his Wardha Plan demonstrated, have to be prepared with the help of experts and local level representatives and concerned people. The development needs of the vast rural India require this. Social scientists, activists as well as the Planning Commission and the state governments should now start afresh on this vital task.*

DR Gadgil entered into district development planning rather late in his life but early in planning in India. There was a chapter on District Development Administration in the Second Five-Year Plan, for the first time. District Development Councils were to be set up in the future for preparation of village plans. The emphasis was on the role of the district administrative officers who were described as "an agency of change towards a new social order".

Planning was from the top. Only the Planning Commission had a notion of the objectives, the strategy, the coordinations necessary at the national level. At the state level and below these were largely absent. I remember three instances of the mechanistic thinking and behaviour of state and local level administrators in the matter of planning at their respective levels. Sometime in the later part of the

1950s, C D Deshmukh was one day describing to Gadgil an instance of this and I was a bystander listening. Deshmukh said that the First Five-Year Plan had set the goal of annual growth rate of agriculture at 5 per cent. In a meeting of the Agricultural Development Commissioners of the states convened by the Planning Commission, in response to a query of Deshmukh, Agricultural Development Commissioners from state after state stood up and said that the projected growth rate for their state was 5 per cent. "I am sure if I had asked the same question of the district agricultural officers in any state, I would have got the reply, 5 per cent", said Deshmukh. A second example: As a nonofficial member of the Orissa State Planning Board in 1972, I heard the governor of the state inform the board that the deputy chairman of the Planning Commission had informed him that the commission had set

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\*Source: *Economic and Political Weekly*, Vol. 37, No. 23 (Jun. 8-14, 2002), pp. 2219-2222.



aside some money in the Fifth Plan for special assistance for tribal area development, and had asked him to submit a special plan proposal for assistance. The governor requested the nonofficial members as well as the officials for proposals for an approach to a tribal area sub-plan. In the next meeting the government secretary submitted a detailed proposal for assistance. It was formulated by inflating fourfold the estimated total plan investments for tribal blocks calculated on a pro rata population basis. A third example: after the new Zilla Parishad Act was promulgated in Maharashtra in 1961 transferring the task of planning for the district to the zilla parishad, the planning officers at the zilla parishad level prepared district plans, year after year, which were calculated from the aggregate state plan estimates, item by item, pro rata on the basis of population.

Simultaneously, towards the close of the Second Five-Year Plan there was talk at various levels about planning from below; but nothing was being done in this matter. At this time in 1960, soon after formation of Maharashtra state, the chief minister of Maharashtra, in consultation with Acharya Vinoba Bhave, requested Gadgil to prepare a comprehensive development plan for Wardha district where Gandhiji lived for many years. Two of my colleagues in the Gokhale

Institute did the entire field work for a whole year under Gadgil's guidance. The draft report, prepared within a year, was discussed at various levels and after the formation of the Wardha zilla parishad, was handed over to it. The scheme, written out in Marathi, was published in 1964. During the early years of the zilla parishads, Gadgil, at the request of the state government, also kept track of the way the zilla parishads were preparing the district development plans. In 1966, soon after he retired from the Institute, Gadgil delivered the Founder's Day Address in the institute on the subject, District Development Planning, in which he used his experience with the Wardha Plan to formulate his propositions. When a couple of years later he became deputy chairman of the Planning Commission, a unit on district planning was set up in the commission. But I do not know that much work was done there. For, the main work was to be done at the district level; and the zilla parishads have not had much responsibilities in this matter until now. The two documents on which I depend in this essay are the Wardha District Development Plan (in Marathi) and 'District Development Planning' Gadgil's address in 1966. I shall use the first to illustrate the points made in his lecture. Gadgil drew a distinction between regional planning in western literature and district level planning in India. The former has two focuses: one is what is

called 'supraurban space'; the other is backward or depressed regions. Neither of these, Gadgil said, were relevant in the context of district development planning. The district is an arbitrarily formed administrative unit, with no necessary homogeneity in physicoeconomic terms.

A proper approach to district development planning, he suggested, would be to identify economically homogeneous sub-regions for the purpose since inter-connections are not only essential but also indicative of some common base. He considered the market or mandi centres as meaningful sub-regions for planning. Not a village, but a group of villages connected to a mandi centre for transactions - both purchases and sales - and consequently also for services like medical and educational facilities, is a proper unit for planning. The first thing to do is to improve communications, mainly roads. The Wardha plan suggests improving road communications for different groups of villages characterised by milk and animal production and marketing, irrigated crop development potential, transport of forest fuel and fodder. These were suggested in several stages, that is, in successive five year plans. Another related consideration in prioritising plan investment in road connections was provision for wage

employment for the landless and marginal (part-time) farmers who were more numerous in most regions.

Some officials became critical of the very large investment on roads suggested in the Wardha plan. It is, however, necessary to remember that any activity to be promoted in villages needs communication facility for both inputs and outputs as well as advice and help to move in. I remember reading in some village survey reports of the agro-economic units (set up by the ministry of agriculture in different universities) very pointed demonstration of villages with otherwise similar physical agricultural conditions and social classes, sharing very different growth and progress in almost all fields: those near and with road connection and those far away without such connections. I am also aware of villages, with fairly high rainfall, having large milk production, from where fluid milk could not be marketed since there was no all-weather road connection. The result was conversion of milk into 'khawa' (less quickly perishable) that incidentally made a larger demand for fuel wood and of course prevented expansion of milk production. A few years ago I read a letter written by all the health vaccinators of a district to the district health officer and collector saying they will not go for triple vaccination work to any village from where they

cannot return the same day (due to absence of roads). Unpublished tabulation of 1991 village census data for many Maharashtra districts shows that there were only two factors accounting for the different literacy rates amongst villages: the size of the village and its road connection with nearby villages.

Gadgil argued, and demonstrated with the Wardha plan, that what is needed is an integrated development plan for every mandi-centred area of the district that will help add up to the total district plan. The roads are an important ingredient of the socio-economic overheads that must be provided for sustained development. He suggests two requirements of this provision: "In the first instance the spread must be such as to benefit all areas in the district and, secondly, the provision of the costly utilities and services must be arranged from a hierarchy of convenient centres" (p 21). "A physico-geographic plan is thus a plan of communications and of the development of a series of centres at and from which certain services and amenities are provided. All this is obviously closely connected with the concept of the mandi area" (p 21).

While the existing marketing centres would serve as such centres, development may also involve "growth of industrial or other activity which helps to transform the economy of a surrounding

region" (p 22). Such activities may be developed in existing centres or, where necessary, new centres for the specific purpose may be planned.

Besides roads, the Wardha plan went into some other items of socio-economic overheads like provision for primary, secondary and technical education, almost entirely in the public sector, where the community in villages was expected to make some contribution towards the capital expense. So was the case in regard to primary health service and village hygiene and sanitation. The latter was a joint effort of the village community and the state. The plan provided for secondary schools and primary health centres in areas that had none. In areas away from major mandi-centres, moving hospital and ambulance services were designed. It was suggested that the contribution of the village community, instead of being in uniform proportion, should be in keeping with the general economic condition of the village.

That uniform approach in this matter would be undesirable may be illustrated with reference to primary schools. Many tribal villages in the large central Indian tribal belt (spreading from Santal Pargana district in the east to Thane and Valsad in the west) are very small, with less than 250 persons. It is very expensive for the state to run full-fledged primary

schools in such villages with hardly 20 children of primary school-going age. The result is either no school or appointment of only one teacher - without a school room and house for the teacher - resulting in the teacher never being there. An unavoidably necessary alternative appears to be a residential primary school, for the children from five-six adjacent villages, centrally located, where the state bears the entire cost. It will involve, besides the entire provision for school and hostel, roads to the school from the villages. Such an approach is not necessary for bigger tribal and other non-tribal villages.

### **Conserving Natural Resources**

The second aspect of a district development plan would be the conservation and development of natural resources. It involves resources of soil, water and vegetation that are important for agriculture as well as other primary activities. A mapping of the district from this point of view is necessary. Here too the 'mandi-area' is likely to demarcate regions. The important point is that while this is a common approach for the whole country, planning would require local details since the endowments and needs are sure to be location specific.

Like in case of the socio-economic overheads, the conservation and development of natural resources is to a large extent either governmental activity or joint activity of institutions/individuals and government. The Wardha plan considers three: soil conservation, consolidation of holdings and provision for minor irrigation. Now, only about half the total geographical area of the district was identified as needing soil conservation measures. The plans suggested priorities in carrying out the work, of course at state cost, in different regions. The priority was decided upon on the basis of areas where there was greater possibility of development of irrigation and also where this labour-intensive work will not come into conflict with another such, namely, road construction work, in terms of labour supply. By the time this is complete, road construction will be complete in the other area where bunding work can then be taken up. There was likely to be problem of water accumulation in certain areas of heavy black cotton soil as a result of bunding. In these areas methods of draining the excess water or using the land for high water demanding crops or sinking wells, etc, have to be taken up simultaneously. There was also problem of draining chronically waterlogged areas.

Similarly, for minor irrigation works there was provision for nala-bunding and training and percolation tanks, besides dams across streams. But the state of groundwater was uncertain leading to large number of dry abandoned wells. The plan envisioned state effort to develop methods of assessing groundwater, on a priority basis, in areas otherwise suitable for irrigated horticulture and made provision for this. But wells have to be on private account.

Forests are in the public domain. But they are a source of grass for cattle and fuel wood. The forests that are not under teak can produce fuel wood as well as grass. The latter also grows in reserve forests but are uncared for by the department. While the plan makes provision for fund for improving this, the present-day scheme of joint management can do better at less cost. I may in this connection draw attention to a possibility in many areas which the Wardha plan or Gadgil did not refer to at that time. In many forest regions, particularly in the central Indian tribal belt, there are vast stretches of forest area where there is hardly any worthwhile vegetation cover. These can be given to the tribal households in patches of about four hectares each, on long-term inheritable usufructuary lease, only for sylvi-culture. The development can start with planting bamboo and quick growing fuel wood

trees in which the lease-holders can be employed underemployment assurance schemes. The high mortality of planted saplings will mean repeated planting that would keep people employed for about five to six years, by which time the cycle of production in these forests will begin. Such a plan can and should be synchronised with other works of road-building and soil conservation.

In all these conservation and development measures, there was greater stress on public expenditure. But on agricultural production, including milk and fish, the stress was on private effort aided by firm technical advice, provision of seed and other facilities like technical centres for checking soil, etc., and advice by the staff. This was also identified mandi areawise, depending upon the product patterns and possibilities.

These are mentioned in some detail to illustrate the points made by Gadgil that such plans have to be area specific and the expenses in the field of actual production have to be more individual than public. But the public agency must come forward with firm information about techniques and provide incentives for adoption where necessary. Attention has to be paid to the provision of credit, marketing and processing institutions.

The existing approach in these matters was - and, we find, still is - departmental and schemewise, in which the local situation and needs are not taken into account. The projected expenditures - and plans for them - have no relation with local needs and priorities. There is no method of coordinating different schemes, both to facilitate full use and create suitable employment opportunities. A district plan, i.e., local level planning, can facilitate co-ordination, synchronisation and prioritisation in order to avoid wasteful expenditure and frustration. It will also provide scope for learning while doing and consequent corrections.

### **Planned Industry**

Besides natural resource conservation and use, Gadgil emphasised industrial activity; for, that has to be the focus for greater employment generation as well as for better agriculture. Agricultural processing at different levels has to be planned in the sense of indicating the techno-economic possibility in different mandi areas of the district. Cooperative or individual enterprises can come up only when such techno-economic possibilities are convincingly presented. "The rural economy will begin to move", he wrote, "only if industrialisation of the countryside is no longer regarded as only

a supplementary or side issue but as the main result aimed at by the programme of industrial development" (p 25).

Gadgil recognised that in rural India agricultural development as such was not likely to improve the condition of the bulk of landless labourers and part-time farmers. "All those who command very inadequate or no productive resources cannot hope" he said "to benefit directly from any of these programmes of development planning; and as there is little likelihood of the vast majority belonging to this class obtaining productive resources through measures, say, of redistribution of land, the programme required by them and for them is essentially that of provision of adequate employment" (p 25). But he was equally emphatic that this programme of employment provision cannot be additional to provision of socio-economic overheads, expansion of non-agricultural primary production and industrial growth in the countryside. "The concept of the additional public works of the Planning Commission", he asserted, "is illogical and merely shows up the failure to plan adequately. ...a rural works programme which is conceived of as additive will not be properly integrated with planned programme and will to that extent be wasteful of resources" (p 25).

This employment generation must be an additional object of local level planning. "The entire programme of additional economic activity directly undertaken by public authorities together with any expected increase in employment offered by private operators must generate the total employment required. The size and the degree of labour intensity of planned public activity must be related to this objective; also, as the aggregate employment has to be properly distributed over space and time, the distribution, over the area of the district, of planned activity and its initiation and closure in time have to be regulated in relation to specific local requirements. Moreover, the generation of additional employment has to be looked at as not being related to a particular year, but as a continuing long-term requirement. The employment requirement should thus not only affect the size and shape of the annual plan but also deeply influence the perspective and strategy of all planning. The employment aspect of planning thus colours and orients the whole process" (pp 25-26).

This formulation raises the very important question of resources for the plan. There are two aspects to this question: In the first place for a proper district development plan the zilla planning authority should have a total financial resource which it will be free to allocate

on the various lines. The state shall not give department or projectwise grants, which will be a complete negation of local planning.

At the time Gadgil was writing, Maharashtra had a Zilla Parishad Act, which had provided for considerable devolution of budgetary resources and powers to the zilla parishad. Nevertheless, Gadgil notes the very undiminished power of the state secretariat. The state plan was prepared irrespective of the district plans from the ZPs, and the heads of departments had their way at the lower level. The administration was very slow in learning to live with decentralisation. But despite this, the political leadership became alarmed when they and the legislators thought district planning was reducing their relevance in matters of local development. The result was, just about the time Gadgil breathed his last, the death knell of district planning was sounded in Maharashtra by an amendment of the Act. It has not yet been restored.

Similar has been the situation in a few other states. Some legislative effort and decentralisation and devolution of administrative and planning responsibility and resource to zilla parishads were, after a few years of experience, withdrawn, for reasons similar to Maharashtra's.

The 74th amendment to the Constitution made the constitution and timely election of zilla parishads and lower level panchayat institutions obligatory, provided for a state finance commission and cited 27 different subjects in which the state legislatures were to statutorily transfer powers and responsibilities. But the states have taken the words of the Constitution literally and narrowly. The Constitution does not say how much of what should be transferred; it leaves this to the state legislatures. Different state laws have transferred different - often very limited - powers and responsibilities to zilla parishads. There are great variations in this matter from state to state: while one left front governed state legislature transferred nearly 40 per cent of revenue and plan resources to zilla parishads, another left front ruled state has given the right to zilla parishad to only propose a district plan to the state government in the month of November every year, leaving what is finally done entirely to the state government and legislature. The only resource provided is tax on ghats, haats and funeral grounds! In state after state the zilla parishads function more as agents of the state government. The state finance commissions cannot do anything very much in the matter of devolution of resources to zilla parishads since those have very little power and responsibilities devolved to them. In some states ad hoc transfer of tasks and

funds takes place under administrative decision of the government of the day not statutory transfer. They are, therefore, not only ad hoc but also sectoral.

A second related question raised by Gadgil was about total financial resources. The Wardha plan at that time showed that it had to be much more than what was being spent then. The provision of socio-economic overheads, conservation and development of soil, water and other natural resources, provision of greater information, know-how of improved technology in agriculture and industry and provision of employment for the vast body of landless, part-time farmers and artisans which must form the central focus of district development plan, will require much greater resources than are now being spent in any state. Let me illustrate the point: A careful calculation for Maharashtra showed that provision of primary education in every other district of the state to reach the level prevailing in the relatively best provided district of Ratnagiri at the time of the calculation will require, with the current level of plan provision for this and its projected rate of growth, more than 100 years! If it is to be achieved in 20 years, the resources will have to be so expanded that no more than six of the basic needs of the society can be fulfilled with the present total plan resources. This gives an idea of the volume of the states' plan



resources that need to be spent if the minimum needs of rural society are to be achieved within a reasonable time frame.

All this shows that the situation is far from the way Gadgil pleaded it has to be. It is also not as per the unstated intention behind the constitutional amendment. Ever since the turn around in policy in favour of liberalisation and globalisation, planning has become irrelevant if not a joke. So who cares about district level planning?

I think this betrays complete confusion in thinking and a very sad state of affairs for that matter. The state in India is still responsible, as before, in matters of socio-economic overheads, conservation and development of natural resources, promotion of primary agricultural and non-agricultural production and generation of additional rural employment. No privatiser and globaliser has as yet suggested that the state in India should abandon all this. In fact, there is now very great need and scope for public sector planning in which district level planning must have a very important place. There

is not only need but now a much greater possibility of transferring much larger resources to district level planning. Such plans, as Gadgil argued and his Wardha plan demonstrated, have to be prepared with the help of experts and local level representatives and concerned people. The latter will provide local knowledge, needs and indicate priorities. They will also be active in monitoring, suggesting mid-course corrections, and in ensuring direct accountability on part of the implementors. The development needs of the vast rural India that is Bharat need this. Social scientists, activists as well as the Planning Commission and the state governments should now start afresh on this vital task.

[This is the text of a lecture delivered at the Centre for Development Studies in Thiruvananthapuram on December 18, 2001, to commemorate the Birth Centenary of the late Dhananjay Ramachandra Gadgil. The page references are to D R Gadgil, *District Development Planning*, Kale Memorial Lecture, Gokhale Institute of Politics and Economics, Pune, 1966.]

## LINKING RIVERS: SOME ELEMENTARY ARITHMETIC\*

Nilakantha Rath

*On the basis of the scanty factual information that has been made available and a few assumptions, it is possible to attempt some elementary arithmetic about the cost per unit of water and per watt of power separately for the three components - the Peninsular, the Himalayan and the Hydroelectric - of the project to link the country's rivers. The results make one despair that instead of doing the first things that are crying out to be done first in regard to irrigation, people are being fed this pie-in-the-sky.*

Very little factual information is available, in published form, to the interested private student about the projected linking of rivers in India. A senior member of the Institute of Engineers, Pune Branch, has collected some very broad figures. The total cost of the project is put at Rs 5,60,000 crore. It has three components: the Peninsular component will cost Rs 1,06,000 crore; the Himalayan component will cost Rs 1,85,000 crore; and the Hydroelectric component will cost Rs 2,69,000 crore. The quantity of water diverted in the Peninsular component will be 14,100 crore cubic metres and in the Himalayan component 3,300 crore cubic metres. The total power generated will be 3,400 crore watts - 400 crore watts in the Peninsular component and 3,000 crore watts in the Himalayan component.

There is no information if the estimated capital costs include the cost of acquisition of land and the cost of

resettlement of displaced persons. I assume these costs are not included. There is a figure of the estimated extra agricultural land that can be irrigated by using the extra ground-water as a result of the diversion of flow water. But this does not help us estimate the extra quantity of water that can be so lifted. Nor is there any information about the capital cost of lifting this water. So we ignore this.

There is no information about the estimated time that will be taken to complete the construction of the project. On the advice of a former engineer-secretary of irrigation, government of India, we assume 20 years as the period in which each component of the project will be completed. There is no information about the stages in which the project will be completed and the time-period in which partial benefits may flow. We, therefore, assume that the benefits will begin to flow after each component of the

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\*Source: *Economic and Political Weekly*, Vol. 38, No. 29 (Jul. 19-25, 2003), pp. 3032-3033.

project is completed, i.e., 20 years from the start of construction. Nor is there any information on the expected annual instalment of expenditure. We, therefore, assume that every year equal amount will be spent on construction.

On the basis of these few facts and assumptions, we attempt some elementary arithmetic about the cost per unit of water and per watt of power in the three components separately.

We attempt this arithmetic under three other alternative assumptions. In the first, we assume that no interest shall be charged on the capital during the 20-year period of construction. But interest at 7 per cent a year will be charged for recovery of the capital cost over an estimated recovery period of 50 years.

The second alternative assumption is that compound interest will be charged on the capital spent each year on construction over the 20-year period. The total capital cost of each component will turn out to be much larger than what is estimated on an interest-free basis. The annual cost of recovery of this larger capital over the next 50 years will also be calculated assuming an annual interest of 7 per cent.

The third alternative assumption is that the annual capital cost, inclusive of interest, will increase at an annual rate of 5 per cent every year due to inflation. This is attempted only to suggest a realistic estimate of the total capital expenditure at the end of the period of construction, i.e., 20 years. A capital recovery factor is not calculated assuming inflation since prices of all products will rise.

Using the above methods it is possible to calculate the annual cost of a cubic metre of irrigation water in each of the two components. But this does not help the reader to compare the present water charge in the region with the estimated costs. For that purpose, it is necessary to calculate the capital cost of irrigating an acre or hectare of land under a particular crop. We calculate the annual capital cost of irrigating an acre of hybrid jowar in both the component regions. An acre of hybrid jowar under lift irrigation requires 18 acre inches of irrigation water at the field end. It is safe to assume that to reach this amount of irrigation water to the field, in a flow irrigation system, half the water will be lost in transit, due to evaporation and seepage.

So the annual capital cost of providing one acre of hybrid jowar with irrigation will be the cost of 36 acre inches of water. (The reader can calculate the cost for

other crops. For example, an acre of sugar cane in the Peninsular region requires 180 acre inches of water.)

Now, assuming no interest and no inflation during the construction period, the total capital cost for providing irrigation to an acre of hybrid jowar will be Rs 27,815 in the Peninsular region and Rs 2,07,418 in the Himalayan region. Assuming a 7 per cent interest rate per year, the equated annual instalment of capital and interest for recovery of the total capital over 50 years will be Rs 2,015 in the Peninsular component and Rs 15,030 in the Himalayan component. This is useful arithmetic. It helps to compare the estimated annual capital cost (which does not include the cost of administration of the water supply system) of irrigating an acre of hybrid jowar, after instantaneous completion of the project, with the present irrigation charges and the income net of other material expenses.

But interest over 20 years cannot simply be assumed away. Assuming interest at 7 per cent, the compounded total capital cost of the Peninsular component at the end of 20 years will be Rs 2,17,276 crore. The total capital cost per acre of hybrid jowar will be Rs 57,014 and the annual capital recovery cost alone for the crop will be Rs 4,131.

The total capital cost of the Himalayan component, at 7 per cent annual interest compounded over 20 years, will be Rs 3,79,208 crore. The capital cost per acre of hybrid jowar comes to Rs 4,25,173. The annual capital recovery cost per acre of hybrid jowar, at 7 per cent interest over 50 years, comes to Rs 30,808. Since a large part of the water will be used in Rajasthan and north Gujarat, the capital cost of water per year per acre turns out to be phenomenal.

The capital cost per watt of electricity, calculated without any interest over the construction period, comes to Rs 89.6. The annual capital recovery cost, at 7 per cent interest over 50 years, comes to Rs 6.5 per watt. If we assume an interest rate of 7 per cent over the construction period, the capital cost per watt of power comes to Rs 183.8. The annual capital recovery cost, at 7 per cent interest over 50 years, comes to Rs 13.3 per watt.

Finally, a word about the likely actual cost. The official estimate does not mention the factor of interest or inflation in calculating the total cost. We have seen above that if we assume a 7 per cent interest rate to be charged on the capital during the construction period, the total cost of the three components will come to Rs 11,47,873 crore, approximately double what is now suggested.

But, the above does not take into account the factor of inflation during the construction period. Assuming an annual rate of inflation of 5 per cent, the total capital cost of the three components, at the end of 20 years, will come to: Peninsular Rs 3,81,878 crore + Himalayan Rs 6,66,485 crore + Hydroelectric Rs 9,69,105 crore = Rs 20,17,468 crore at the end of 20 years. This comes roughly to one lakh crore rupees a year.

There is a saying in Oriya 'collect sixty maunds of ghee, only then will Radha dance'. It is a pity that instead of doing the first things that are crying out to be done first in regard to irrigation, people are being fed with this pie-in-the-sky type of slogan.

[This is part of a presentation at a meeting of the Institute of Engineers in Pune on June 20, 2003.]

## TWELFTH FINANCE COMMISSION AND MINIMUM NEEDS\*

Nilakantha Rath

*The Twelfth Finance Commission should provide for grants-in-aid for states to ensure universalisation of basic social services within a certain time frame. It should also determine how many such needs can be taken up for grants-in-aid at a time and how much aid can be provided for each objective in a year.*

Here are two suggestions for consideration of the Twelfth Finance Commission (a) on grants-in-aid, including measure to augment the resources of the zilla parishads and gram panchayats and the municipalities, and (b) on outstanding loans and interest of the state government.

### **Grants-in-aid**

Besides the division of the central tax revenues between the union and the state governments, Finance Commission has recommended grants-in-aid to the state governments. The First Finance Commission laid down five basic principles that were to govern this. In addition to the first three, relating to the examination of state budgets on a uniform basis, assessing genuine deficits of individual states, the extravagances in state budgets, and the provision for abnormal conditions faced by a state, two other principles were, "where standards of social services in any state are significantly lower than in others, it should qualify for special

assistance", and "grants may be made to certain states for the furtherance of broad purposes of national importance, such as primary education, in respect of which they may be specially backward". Following this formulation of principles, the First Finance Commission began by formulating special assistance to states, to start with, for expansion of primary education.

But by the time the Second Finance Commission was set up, the Planning Commission was already established and was making allocations of both revenue and capital resources (including loan funds) among the union and the states. The Second Finance Commission noted the inevitable anomaly that arose in regard to the functioning of the two commissions. The Finance Commission, therefore, took the view that "it is the function of the Planning Commission and the National Development Council to ensure the equalisation, as far as practicable, of the standard of essential social services in the various states of the

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\*Source: *Economic and Political Weekly*, Vol. 39, No. 26 (Jun. 26 - Jul. 2, 2004), pp. 2668-2670

union.... For our scheme of devolution, we have accepted the plan as ensuring an equitable development in the field of social services. There is, therefore, now no room for any grants in this field, such as grant for expansion of primary education recommended by the last commission". For the Second Finance Commission, "grants-in-aid should be a residuary form of assistance given in the form of general and unconditional grants". This has remained the approach of all the later Finance Commissions.

Unhappily for the country, the Planning Commission and the National Development Council have not been able to fulfil the basic minimum needs of the people in such matters as primary education, primary health services, provision of protected drinking water, all-weather roads linking villages to the nearest highway, to mention only some of the absolute minimum needs. It is not necessary to quote statistics; see the large portions on literacy and primary education in the union finance minister's speeches during the last four years (with few funds to match) or the prime minister's gram sadak yojana. These are indications, if indications are needed, of the failure of the Planning Commission in this basic task for over half a century.

The directive to the Twelfth Finance Commission to recommend measures to augment the resources of the panchayats and municipalities, in the light of the recommendations of the state Finance Commissions, has complicated matters. The complication arises because of the failure of state legislatures, barring one or two, to transfer the powers and responsibilities on the 29 subjects listed in the Constitution to the local bodies. The 73rd and 74th Amendments to the Constitution had left this task to the state legislatures. This has left the state Finance Commissions in an unenviable position.

The result is that the local bodies - the panchayats and municipalities, particularly the former - are without adequate statutory powers and functions, and assured and steady resources to go with them, on the basis of which they can design local development schemes. Tasks and funds come to them in an ad hoc, arbitrary manner from the central and state governments. Local bodies are used essentially as agents of the central or state governments to carry out specific tasks. The very specific task for which the central government provides funds, is more often than not completed in the stipulated period. The sudden and arbitrary transfer of funds by state governments, on the other hand, leads to accumulation of sizeable funds with local

bodies. For they cannot suddenly think up schemes and execute them. The decisions, both at the central and state levels, are purely political with no assurance of continuity. This is hardly the pattern of decentralisation of power and funds visualised in the Constitution.

In the light of these failures, it is necessary for the Twelfth Finance Commission to revert to the basic principles enunciated by the First Finance Commission. This is further necessitated by the vastly reduced responsibility of the Planning Commission since the change in economic policy was introduced a decade ago. The Planning Commission has little responsibility in regard to investments in the Indian economy, starting of industries and their location. Even public sector investment is small today. The emphasis is on disinvestment and reduction in public expenditure. Under the circumstance, the justification provided by the Second Finance Commission to give up the principles of grant-in-aid formulated by the First Finance Commission is no longer relevant. The Finance Commission should resume the task of giving specific, conditional grant-in-aid to the states. Indeed, the commission should extend this to the panchayats and local bodies and insist that the states pass laws transferring listed powers and functions to the local bodies, so that the state as well as

the union Finance Commissions can meaningfully carry out their task of division of resources.

I suggest that the Twelfth Finance Commission list the basic social services and broad purposes of national importance to use the language of the First Finance Commission for which the state in India is and should continue to be responsible. Then, it must start with one or a few, like primary schools, primary health centres, roads linking villages to the nearest highway and development of sources of protected drinking water supply in villages, on which it must provide for grants-in-aid to states over the coming years, in such a manner as would ensure universalisation of these services within a certain period. It will not be enough to work out the amount of such grant from year to year, but there should also be a formula by which this should be done, to preclude political decision in the matter.

Let me exemplify the approach with reference to village roads. First, the commission must obtain the number and proportion of villages (including the hamlets) in each state that today are not connected by all-weather roads to the nearest highway. Each state should also be required to give an estimate of the average cost of connecting the village by



such roads. The commission can calculate the percentage of villages in the country as a whole that do not have such road connection. The principle should be to first help states where the proportion of villages without road connection is higher than the all-India average. Roughly half the states in the union are likely to be covered by this formula. Politically, this is better than starting with the state with the largest percentage of such villages to bring them to the level of the next highest. The approach should be to bring the states that have a percentage of unconnected villages higher than the all-India average, to the level of the all India average. For this, the estimated cost of bringing these states to the all-India average level should be worked out on the basis of the average cost of such road connection for each state. Then the commission must recommend how much money may be passed on as grant-in-aid for this purpose in a year. Completion of the task of bringing these states to the all-India average will take the number of years indicated by the division of the total estimated cost by the annual total grant-in-aid for the purpose. The grant-in-aid should be divided among the concerned states in proportion to their estimated cost as a percentage of the total cost for all concerned states.

Once the states with a larger percentage of villages without roads than the all-India average are brought to the level of the all-India average, the latter should be recalculated. Again, those above the all-India average should be provided with grant-in-aid for the purpose to bring them to the all-India average level. This will bring some other states, which had better provision than the earlier all-India average, into the picture. This process should be continued until all villages are provided with roads connecting them to the nearest highway.

The same method may be used for making provision for primary schools, primary health centres, and so on. In fact, provision of school education up to the 8th standard is now a basic need, in view of the constitutional provision making elementary education free, compulsory and a fundamental right. In case of primary school, elementary school and even primary health centre, another factor should be taken into account. The measure of the present provision of primary schools should not be only the number of villages with or without a school. The number of teachers per 100 children of primary school-going age, or in absence of that data, per 100 population should also be determined for the base year. Before making provision for additional schools, financial provision should be made for all villages with schools to

maintain this ratio in the light of the growing population. Once this financial provision is made, the establishment of new schools should follow the same method as described above for village roads.

The Finance Commission must decide how many such basic needs can be taken up for grant-in-aid at a time and how much aid can be provided for each objective in a year. In view of the lost time in meeting these universal needs of the population during the last half century, I think the Finance Commission will be under pressure to make the maximum allocation in order to complete the task of universal provision at the earliest.

It is necessary to note that it would not be enough for the commission to recommend such grant-in-aid to the states on specific subjects. The commission has also a responsibility by the panchayats and municipalities. Therefore, the commission should ask the state governments which are to receive such grant, to make the same kind of analysis for their taluks or blocks. Only those taluks or blocks in the state that have a larger proportion of villages without the facility shall be the recipients of this grant-in-aid. It must be ensured that the local government (in this case the taluk or block or mandal panchayat) must transfer the grant to the panchayat of the village that has to have

this service facility. This makes it imperative that the panchayat law of the state transfers the responsibility and power in connection with it, to the district/block/gram panchayats. Once this is done, the state Finance Commission can devise a method of transferring resources from the state to the local bodies. This will ensure continuity of supply of resources to the local bodies, which in turn will enable them to plan development activities in an ordered and systematic manner. This will create greater local accountability and, in the long run, better administration of the area.

If the Finance Commission adopts this approach, it would not only help in the quick universalisation of basic social services, but also lead to better democratic government in the country.

### **Loan and Interest**

Most state governments today face a serious situation with regard to their loan and interest payments. I have a few suggestions in this regard.

- In view of the declining interest rates, the state government should repay the outstanding public loans and incur new public debt in its place at a lower rate of interest. Most states are beginning to do this.
- During the past five decades, state

governments have received loans from foreign governments and international financial agencies. These have come to the states through the union government. While they have been soft loans carrying low rates of interest and repayable over long periods, the government of India has charged higher interest rates for such loans to the states. In view of the difficult financial position of many state governments, the Finance Commission may be requested to recommend that these loans be calculated at the interest rates which the lenders have charged the union government. If accepted, the entire interest payment and loan repayment by the state government should be recalculated and financial relief provided.

- The third type of loan to the state government is provided by the union government from its own resources from time to time. Interest on these loans should be recalculated on the basis of the weighted average interest of all loans floated by the union government during the year when a particular loan was made to the state. Thus, recalculated year after year, there is scope for some relief to the state government.

- Other than such relief, essentially on account of interest payment, there is scope for retirement of loans by the state government by selling off some/many of its public enterprises. This is not a matter for the Finance Commission to take up, but for the state government itself. Some

of these units may not be productive enterprises but only aid/loan-giving corporations. If their administrative cost is higher than the aid/ loan given, they should be closed and their assets sold in auction. The task discharged by them can be handled by a government department or bank.

As for productive enterprises, most of these should be sold to private parties and the sale proceeds used to repay a part of the outstanding loans. If an enterprise simply cannot be sold, it should be closed and the sale proceeds used to retire debt.

I would like to cite an example from my experience, when I was a non-official member of the Orissa State Planning Board in the early 1990s. There was a discussion on the state lift irrigation corporation, which was continuously in the red. In response to the chief minister's query for suggestions, I proposed that each lift irrigation unit should be sold to the cooperative or company or society of farmers using water from the lift, at no cost to them. The entire fixed assets should be transferred to such users' bodies, and the government should pay the electricity bill unpaid till then. The government should wash its hands off it. This would save the annual subsidy that the government pays today. I was told that farmers were not willing to take over the units. I then suggested that the unit be

sold to the employees of the corporation without recovering any part of the cost of the assets, on condition that the employees resign their jobs in the corporation and run it as a private enterprise. As far as I know, nothing has been done so far.

I may venture another suggestion on a matter that is causing considerable outgo in the form of loan and subsidy to the state government: the state electricity distribution system. Today, there are four regional distributing companies, who are unable to bill every user in time and collect the money. They are unable to check theft and they are reluctant to extend electricity to rural areas, including those which have lines, because they think that is the only way of minimising losses. I do not think these companies can substantially prevent theft. The only way to minimise theft is to make users the owners of the company supplying power or make the workers who are responsible for distribution the owners of the supplying company. For this purpose, all rural supply lines under a substation

should become one supply unit, to be run by either a users' cooperative/company/society, or by a company of technical and administrative personnel running the system under the sub-station. As in the case of lift irrigation units, the fixed assets under the sub-station should be transferred to these units free of cost. They should also not be burdened by any dues or loans of the company. Only in case the company is formed by the employees, should they agree to resign from their jobs. In urban areas, it can be either of these forms or a pure private company, that should take over distribution.

In both rural and urban areas, the company should purchase electricity at the substation. They should be free to charge their buyers at the rates they fix. This need not raise be surprising. For, there is an electricity regulatory commission in the state, which can always be approached by the consumers if they think they are being charged in excess. This entire exercise should be completed within two years.

# REVIVAL OF COOPERATIVES\*

NILAKANTHA RATH

*A critique of the Vaidyanathan Committee report on revival of cooperative credit institutions, which has made wide-ranging recommendations for an overhaul of this sector.*

This article offers a detailed critique of the report of the task force on revival of cooperative credit institutions. The report shows signs of being rather hurriedly written; surely the short time at its disposal must have been responsible for this feature. Nevertheless, it is necessary to make a couple of points on chapter 2 of the report chaired by A Vaidyanathan before turning to the specific recommendations in the later chapters.

The statements in paragraphs 2.08 and 2.09 do not seem to take fully into account the circumstances that led to the recommendations of the Reserve Bank of India's Rural Credit Survey committee, way back in 1954. That committee found that savings in rural India, including the value of land development works carried out by the farmers on their own lands, constituted only about 6 per cent of GDP from the rural sector. This was too small to help finance the large current and capital inputs being designed under the first five-year plan for agricultural development. The committee estimated a total of Rs 900 crore as required for short-term annual production credit to

agriculture, which later came to be known as crop loans. The overwhelming bulk had to be provided by the RBI. There was discussion at that time of the possible impact of this injection of cash into the economy in terms of money supply and inflation. Further, in view of the weak financial position of the cooperative credit societies and the possible lack of commitment on the part of the members in careful disbursement of loans and recovery of dues, it was felt necessary to provide guidelines about the type of loans to be advanced, the amounts for various purposes, the interest rates to be charged, the securities to be taken into account and the manner and timing of repayment. In all this, the RBI and its committee were behaving like responsible creditors. There is no doubt that the resultant credit system helped agricultural developments over the next 10 to 15 years.

The trouble began later. Agriculture developed, unevenly of course, in different parts of the country, bringing about significant changes in the economic and financial positions of the farmers in the areas. But, the pattern of loans, etc.,

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\*Source: *Economic and Political Weekly*, Vol. 40, No. 43 (Oct. 22-28, 2005), pp. 4582-4584.

devised under very different conditions, continued everywhere. Indeed, this pattern was strengthened over the years. The interest rates continued at a very low level. No account was taken of the farmers who earned consistently large incomes, in regard to supply of credit, interest rates to be charged and their deposit behaviour in credit societies from which they borrowed. No wonder, farmers drew credit from societies, but put their savings in district central cooperatives or commercial banks. These were steps that surely were not designed to ensure greater responsibility and self-reliance on the part of the farmer-members. A simple instance will indicate that the situation would have been different if appropriate policy measures had been taken in time. In Kerala, the primary agricultural credit societies (PACS) accepted deposits from members and made advances to them in large measure, because of the huge flow of funds from the Gulf. The rates of interest on these deposits and on the entire non-agricultural advances made from these deposits were relatively high. The advances to agriculture, on the other hand, were relatively small and at much cheaper rates, since these were from the advances from NABARD (through the district cooperative credit banks (DCCBs)). The repayments of the non-agricultural loans were nearly 100 per cent, while on agricultural loans it was

hardly 60 per cent. The agricultural loans were not from the members' deposits and there was no scrutiny of the requests for loans (but advanced by the formula laid down by NABARD) and no supervision or judgment by the members.

### **Role of NABARD**

The second point is that the Vaidyanathan Committee report also says very little about the role of NABARD in this unhappy state of affairs. NABARD rigidly followed the rules laid down in the 1950s on crop loans, and, if anything, made these even more stringent over the years. The crop loan norms for specific crops in different districts were revised only periodically. The member-farmer asking for a loan was given the specific amount based on his declared crop pattern for the season or year. There was no flexibility and no question of local judgment. The rate of interest was fixed by NABARD. Often during this period, the interest rate charged of the primary borrowers was lower than the deposit rate in commercial and even DCCBs. The interest on advances to Scheduled Cooperative Banks (SCBs) by NABARD for crop loans was often lower than the bank rate. The freedom to the cooperative banks and societies to fix their own rates of interest, granted since 1994, was largely meaningless, not only because of the stipulation by the state registrar of

cooperatives, but also by NABARD. The latter stated that cooperatives receiving advances from it towards crop loans at a certain low rate of interest must provide the loan to borrowers at the specified rates. Even recently the central government has advocated low interest rates on advances to farmers a policy that will be implemented by NABARD. In regard to medium-term loans for purchase of tractors, NABARD did not think it necessary and proper to adjust even for the value of the old tractor and the improved income position of the farmer, while granting loans for a new purchase. The report notes the policy of NABARD to refuse refinance to cooperative credit societies registered under the new acts of the Andhra pattern (1994); but it does not mention the gross inconsistency of NABARD in refinancing, through commercial banks and self-help groups which as yet have no legal basis! Even in the brief review of the policy in regard to rural credit, it would have been useful to point these out in order that proper follow-up recommendations are made.

Before going into the recommendations of the Vaidyanathan Committee, it would be useful to draw attention, briefly, to some salient features of the present outstanding loan structure of the farmers and the role of cooperative societies. The recently published report of the NSSO (Report No 498), *Indebtedness of Farmer*

*Households*, in 2003, shows that about half (48.6 per cent) of the farmer households in the country had outstanding debt; the remainder were free of debt. But, only about a quarter (26 per cent) of the indebted farmers had any outstanding loans with the cooperatives. (This means, hardly 12 per cent of all farmers in the country had taken loans from the cooperative institutions.) The bulk of the debt of the indebted farmers was with either banks or moneylenders and traders and sundry others. (The detailed relevant data are reproduced in the Appendix table.) Of course, the situation in different states was different, quite often very significantly. While in states like Maharashtra, Haryana, Gujarat and Kerala anything between 40 and 60 per cent of the indebted farmers had taken credit from the cooperative societies, in states like Andhra Pradesh, Tamil Nadu, Karnataka, Madhya Pradesh, Punjab and Rajasthan, where 50 to 89 per cent of the farmers were indebt, the share of cooperatives was ridiculously small. In most of the remaining states, the role of the cooperatives was minor. In Andhra Pradesh, where 82 per cent of the farmers were in debt, only 10 per cent of their debt was to the cooperatives. While in the country as a whole 58.4 per cent of the total outstanding debt of the farmers was for agriculture (current as well as capital expenses), the co-operatives (which may

be presumed to have lent only for agricultural purposes) accounted for just about a third of this amount; two-thirds of the outstanding agricultural loans were from the banks and moneylenders and traders. All this shows that the cooperatives had ceased to matter in any significant way with the farmers except in a couple of states. The farmers in most parts of the country are depending on banks, moneylenders and traders. Both these agencies charge higher rates of interest, the latter much higher. (The high incidence of farmer suicides in Andhra Pradesh fits in well with the fact that while 82 per cent of the farmers there were indebted, the moneylenders and traders accounted for more than 58 per cent of their total outstanding debt!) The farmers today are borrowing from these institutions at higher market rates; but not from cooperatives. For, the cooperatives have little resources of their own and excessive overdues probably plague many. This is what the prolonged provision of cheap credit from outside sources like the RBI/NABARD has resulted in. And, now, the government, as per recent reports, is planning to provide almost unlimited credit at 8 per cent interest through the cooperatives. There is no better method of handing out the cooperatives a coup de grace.

I may now turn to some of the specific recommendations made by the committee and examine them in the light of the present situation.

(a) The committee has recommended that the cooperative credit societies and banks should become free of state control and an Andhra-style act should be passed in every state. As a prelude it has recommended that the shareholding by the state in individual cooperative institutions should be wound down. Consistent with the approach of the Brahma Prakash Committee recommendations and the Andhra act, the committee has advocated freedom to the primary credit societies to be or not be a member of the three-tier structure and to associate with any other credit institution such as a commercial bank. It has said that the cost structure of the credit societies and even of the DCCBs, has become very high because of its salary structure being inconsistent with the workload. The implication is that, the societies should have their own staff and determine the salary structure, in keeping with the workload. And, of course, the societies should be free to determine their own interest rates on deposits and advances.

(b) These are welcome recommendations. But, the committee does not appear to follow up these with other appropriate recommendations:

(i) If the societies and DCCBs are to be free from state shareholding and



control and also of the three-tier structure, then there should be a clear stipulation about refinance by NABARD. The institution at present can provide refinance only to banks. Therefore, in keeping with this, the primary society has to have some relationship with either a DCCB or a commercial bank. If NABARD is to be able to refinance registered cooperative credit societies directly, then the present law has to be amended.

(ii) Experience has shown that an administratively determined uniformly low interest rate on refinanced credit has been the main factor behind the demise of the primary cooperative credit structure. Therefore, two provisions in this regard are necessary: One, the primary society should be free to charge the interest it deems fit. The refinance by NABARD shall be only a few say, three or four percentage points less than the rate charged by the society to its borrowers. The result may be different rates of interest in different PACSs, but that need not matter. NABARD should provide refinance under the present law to the DCCBs directly and not through the SCBs, as is the practice at present. There should be a lower limit to the interest rate to be charged by NABARD to the banks for the purpose it should not be less than 0.5 per cent above the bank rate. And the bank should not charge more than 0.5 to 1 per cent above this rate to the primary

societies. The cooperative should fix appropriate interest rates on its fixed deposits. Second, the amount of refinance during a year to a PACS should not exceed 50 per cent of the total agricultural advances by the society during that year. There must be a design in policy that encourages societies to finance a large part of their loans from their own deposits. (It is disturbing that NABARD has not taken any such care in regard to refinancing the self-help groups!) This will not only attract deposits from members but also lead to greater care in supervision of loans and in their recovery.

(iii) The suggested change in the control of the primary societies and the cooperative banks has led the committee to recommend a soft loan by the centre to finance the surrender of the share holding of the government. I suggest that before the government is approached for such soft loans, effort should be made to adjust the government loan against the amount due towards government guaranteed loans, which have become due for payment by government. The report shows that such guaranteed loans claimed by the cooperative system from the government in 2003 amounted to Rs 1,164 crore. The share capital paid by the state governments to PACSs, DCCBs and SCBs was Rs 1,243 crore. I suggest that effort should be made to write off one against the other, through appropriate transfers

from one cooperative unit to the other, wherever possible, before approaching the government for loans for the purpose. I do not know if the share capital paid by the state for the SCs and STs and others, to the primaries in some states is in the name of the state or of the poorer members. In any case, these should be retained as shares of such members and no compensation to the state for the purpose is necessary.

**Appendix Table: Outstanding Loans of Farmers in India and the States in 2003**

State	Percentage of Households Indebted	Percentage of Indebted Farmer Households Indebted to			Out-standing Loan per Farmer Household (Rs)	Percentage of Loans from			Percentage of Total Loan for Agriculture (Current + Capital)
		Coope-ratives	Banks	Money-lenders and Traders		Coope-ratives	Banks	Money-lenders and Traders	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Andhra Pradesh	82.0	20	31	66	23,965	10.4	20.0	58.2	61.5
Assam	18.1	3	9	27	813	2.7	27.8	27.5	23.3
Bihar	33.0	4	17	49	4,476	2.5	37.0	33.9	42.4
Chhattisgad	40.2	37	27	37	4,122	20.6	50.5	17.2	70.3
Gujarat	51.9	40	23	18	15,526	41.8	27.2	10.9	70.6
Haryana	53.1	44	30	38	26,007	23.9	42.6	27.2	62.2
Himachal Pradesh	33.4	24	28	27	9,618	11.6	47.6	12.7	19.1
Jammu and Kashmir	31.8	1	4	89	1,903	0.2	54.3	16.6	29.2
Jharkhand	20.9	0	38	30	2,205	4.5	55.7	20.7	32.5
Karnataka	61.6	23	32	39	18,135	16.9	50.1	21.9	68.2
Kerala	64.4	46	42	22	33,907	28.3	49.1	9.1	21.4
Madhya Pradesh	50.8	37	23	45	14,218	16.9	38.1	31.6	68.3
Maharashtra	54.8	61	29	13	16,973	48.5	34.1	7.6	75.4
Orissa	47.8	30	36	27	5,871	18.1	43.7	15.6	53.3
Punjab	65.4	38	19	46	41,576	17.6	28.4	44.5	62.4
Rajasthan	52.4	15	21	63	18,372	5.9	27.0	55.7	57.2
Tamil Nadu	74.5	33	23	54	23,963	25.3	28.1	40.1	49.4
Uttar Pradesh	40.3	13	30	35	7,425	6.7	51.2	22.0	60.9
Uttaranchal	7.2	17	40	12	1,108	4.8	39.8	7.6	34.2
West Bengal	50.1	19	22	44	5,237	19.2	28.5	23.7	45.7
India	48.6	26	27	41	12,585	19.6	35.6	30.9	58.4

Note: The data for India includes that for the smaller states that are not included in this table.

Source: NSSO, Indebtedness of Farmer Households, Report No 498.

(iv) Writing off loans at the primary level should be carefully done. Where default has been the result of drought, writing off is justified. But where this is not so, while writing off bad debts, the members concerned should be debarred from the membership of the society, without returning their share capital, which should be absorbed towards part repayment.

(v) This raises the wider question of membership of societies, when we have a current policy of one village-one society. I think it is time to rethink this policy. If the debarred members wish to start a society of their own, no one need prevent them. They can pool their resources and start one and seek credit from a bank or NABARD. At that stage, the refinancing agency will take their creditworthiness and reliability into account. Similarly, many small farmers have been debarred from credit in many societies. In fact, hardly a quarter of all members borrow during a year, and many of the others never feature in the list of borrowers. Some of them may not need credit. But some may be in an unhappy situation of being denied credit by the powers that be. In such a situation, those that feel deprived may be permitted to withdraw from the society and start their own, with their own share capital and savings. One need not be surprised at this: see the

self-help groups (which are effectively cooperatives). Multiple societies in a village should, therefore, be permitted.

(vi) This raises the question of management, salaries and costs. Since each society will have its own staff and fix salaries depending on the workload, even part-time staff for small societies would be justified. Unfortunately, while advocating flexibility of staff and salary, the committee has also talked of economies of scale - in effect, an advocacy for larger societies, with little supervision and control by members. It is time we got rid of this hangover. The committee does not note the fact that in many states a very large contingent of government employees is on deputation to cooperative institutions. (Some years ago in a seminar at Bhubaneswar, a government secretary informed the participants that more than 60,000 government employees were on deputation with the various cooperative institutions in the state.) Their withdrawal can create a huge problem for the state governments.

(vii) Subject to these basic changes, the Committee's detailed recommendations on many more matters are welcome. But, in the absence of the basic change in the co-operative credit structure, all those will be on the same lines as the recommendations of many earlier committees. The situation in agriculture, 50 years after

the RBI's rural credit survey report is very different. There are many regions and areas with highly developed agriculture and others, particularly in tribal and drought-prone areas, with abject poverty. The basic point to be noted is that in the poor regions, lack of cheap credit is not the cause of poor agriculture. So, it is necessary to seek to right the real wrongs, and then credit may become a supporting factor. First things must come first. I hope, in its final report, the committee will take such a view, if the cooperative credit structure is not to go the way it has gone until now.

## ON THE MICROFINANCE REGULATION BILL 2007\*

Nilakantha Rath

*The Microfinance Regulation Bill 2007, which seeks to regulate trusts and societies that help or promote self-help groups, is completely unnecessary since it does not address the needs of the SHGs. Legislation that enables these groups to register as cooperatives and borrow from banks or helps them to form private limited companies under the Company (Amendment) Act 2002 to facilitate borrowing from commercial banks would be more helpful.*

Microfinance groups or self-help groups (SHGs) began to be set up in India around three decades ago. These were essentially mutualities of poor people, built up through their own routine savings. After a sufficient amount had been collected and deposited in a commercial bank, in the name of one or two members, the fund was used by the group to advance small loans to some of its members to meet urgent domestic needs. The rates of interest charged were often two paise a rupee a month or about 25 per cent a year. The members felt that this was much less than what they had to pay the money-lenders. In certain cases, public trusts or registered societies had promoted such SHGs, and in cases wherein members needed bigger loans than the amount of savings in the bank permitted, allowed the group to use a part of the society's or trust's savings in the bank as security against the borrowing of a larger amount. But, the trusts and societies did not work as savings or loan associations. They were just do-gooders. In fact, these SHGs are properly speaking cooperatives organised to discharge one or more activities of the members more economically, thereby costing each one of them less and giving each one a higher return per unit of service rendered. In a credit cooperative, there is no deposit from non-members and no loans to non-members (a necessary requirement of a cooperative). If more money than what the deposits permit is needed to meet advances to members, it is borrowed from organisations willing to lend (like banks).

But the SHGs in India did not seek registration as cooperative societies because in that case they could not have functioned on their own but only according to the dictates of the registrar of cooperative societies of the state. Also, according to the state government and the Reserve Bank of India (RBI), there can be only one cooperative credit society in a village. So, SHGs would not have been permitted to register as credit cooperatives. This, however, created one basic

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\*Source: *Economic and Political Weekly*, Vol. 42, No. 37 (Sep. 15-21, 2007), pp. 3692-3697.

difficulty: since theirs was not a legal entity, they could not put money in the bank in the name of the SHG, but in the name of one or two members. There have been instances of an individual promoter depositing the group's money in his own name in the bank and ultimately disappearing with it. Some years ago the ministry of rural development had advised the SHGs to register with the charity commissioner for Rs 50 (and, of course, the other unavoidable expenses). But, this was later discontinued.

### **A Proper Cooperative Law Needed**

The cooperative society law of the state should be amended on the lines of the model law proposed by the Brahma Prakash Committee of the Planning Commission, or on the lines of the new law passed by the Andhra Pradesh legislative assembly in 1995. But more than a year after the Vaidyanathan Committee recommended the amendment of state cooperative laws on these lines, only one state has done so. Moreover, the RBI during the last couple of years has permitted commercial banks to register the SHGs as depositors in their institution's name, with any two of the three authorised members allowed to withdraw money. This has not greatly facilitated their borrowing from the banks directly

because in many instances such groups find direct dealing with commercial banks rather difficult.

Against this background, it is surprising that the union government has tabled a bill in the Lok Sabha to register and regulate the trusts and registered societies promoting or helping such SHGs, calling them microfinancial organisations, without touching the SHGs themselves. Even after this bill is passed, the SHGs will remain as non-legal entities. It is only such trusts and societies, which have been in the business of helping the SHGs with loans, that will be brought under the umbrella of this act, if it is passed. The societies and trusts will get donations from the National Bank for Agriculture and Rural Development (NABARD) to meet the need for minimum funds of Rs five lakh as well as refinance from NABARD. For many years now trusts, like the Aga Khan Trust, have been helping not only SHGs but also some rural cooperative credit societies, which are not part of a three-tier structure, to gain access to larger funds from commercial banks than what their own savings with the bank permit, by allowing the trust's own deposits in the bank to be used as security. Most of such trusts have their own funds and only help the SHGs in their business. It is difficult to understand why the government of India wishes to create trusts and societies, with

largely state funds, to ultimately work as moneylenders to help the SHGs and poor individuals.

The simpler approach will be for the states to pass proper cooperative laws on the lines of the Brahma Prakash Committee's recommendation or amend the existing cooperative act on those lines, so that the SHGs can register themselves as cooperatives. They will thus be entitled to loans from commercial banks as well as refinance from NABARD. Such groups can also form their own cooperative society which can handle their borrowings as well as deposits with any commercial bank.

An alternative approach is also possible. The Companies (Amendment) Act, 2002, (Act No 1 of 2003) provides for registration of a private limited company of at least 10 members, which will serve essentially its members and which, as the Act stipulates, will be run on cooperative lines (without the mention of the word cooperation). The members can be either individuals or groups or both. The objects of such a company specified in the Act are such that, if properly interpreted<sup>a</sup> a number of SHGs can form such a company and carry out the function of lending money to its members, accepting their savings as thrifts, thereby also "promoting techniques of mutuality and mutual assistance" (an object of the

company specified in the Act), and obtaining loans from outside institutions for the purpose. There are a few ambiguities in the interpretation of the provisions of this Act, leading to doubts about the possibility of discharging this function, as we shall note later. This can be clarified and the path opened for the self-help groups to have their own private limited companies to facilitate their functioning. The present bill appears to be unnecessary, unless the real objective is to promote new money lending institutions in the form of societies and trusts, at state cost.

### **A Bureaucratic Bill**

Since the bill has been placed before the Lok Sabha, it is instructive to see what is provided and what might be implied. On reading the bill, one is clearly informed that the entire registration, regulation and control of the microfinancial organisations are with NABARD. It will not only certify the existing micro-credit organisations but will also help create some with grants, and refinance all such for providing finance not only to SHGs but also to poor individuals for their consumption and capital needs, and also work as the regulator body. These microfinance organisations can also operate through "facilitators" authorised by commercial banks presumably entities like input

traders and village moneylenders to extend loans to self-help groups and poor individuals. These institutions shall be in the nature of middlemen-financial institutions, without being either a bank or a cooperative. These financial institutions will be neither cooperatives, under control of members, nor banks, under RBFs control. In fact, the rural credit institutional situation today is such that if a suitable revision of the state cooperative laws takes place (even without the reorganisation of the commercial banking structure in the rural areas, which in my view is necessary), NABARD might become an unnecessary institution. One wonders if it is to forestall such an eventuality, that NABARD is being endowed with such wide responsibilities to create, finance and refinance as well as regulate, with the help of state funds, such middlemen-financial institutions so that it can live on as another bureaucratic institution to control small private enterprise financial institutions in the far-flung corners of India. A regulator regulates the functions of the institutions; but in this case NABARD is the creator, financier, the superior determiner of administration as well as the regulator of these microfinancial organisations. In fact, recently the chairman of NABARD announced that the organisation is going to create on its own a microfinance

institution with a capital of Rs 100 crore, which it will not only run but will also regulate.

### **Provisions of the Bill**

In Section 2(f) microfinance organisation is defined as follows:

"Microfinance organisation" means an organisation, other than group established for the purpose of carrying on the business of extending microfinance services and includes the following:

- (i) a society registered under the Societies Registration Act 1860 or any other state enactment governing such societies;
- (ii) a trust created under the Indian Trusts Act 1882 or public trust registered under any state enactment governing trust for public, religious or charitable purposes;
- (iii) a cooperative society or mutual benefit society or mutually aided society registered under any state enactment relating to such societies or any multi-state cooperative society registered under the Multi State Cooperative Societies Act 2002, but not including: (A) a cooperative bank as defined in clause (cci) of section 5 of the Banking Regulation Act 1949; or (B) a cooperative society engaged in agricultural operations or industrial activity or purchase or sale of any goods and services.



It is difficult to understand why a society registered under the Society Registration Act or a trust under the Indian or State Trusts Act, which is not designed as a financing institution, should be recognised as a microfinance organisation. Note that the bill says, "*an organisation, other than a group established for the purpose of carrying on the business of extending microfinance services*" (italics mine): I find the above definition rather ambiguous, making it unclear if the SHGs are considered as microfinance organisations or not. It is only after reading the attached statement about the objects of the bill and the explanations about its provisions that I inferred that SHGs do not qualify as microfinance organisations. This implies that such societies and trusts can be recognised as a new set of microfinance organisations, besides the cooperatives, by NABARD. It is difficult to understand why. The difficulty becomes greater when one finds that registered cooperative societies not engaged in credit operations or cooperative banks are not entitled to be recognised as microfinance organisations. In what way is any registered society or trust more suited for this purpose than a farmers' cooperative institution currently engaged in non-credit activities? Furthermore, why and how should a cooperative credit society, agricultural or non-agricultural, be brought under the direct control of

NABARD, (which is what is implied by sub-clause C above), when it is functioning as a cooperative society for that very purpose under the state law? The cooperative credit societies are member-controlled organisations, designed to accept deposits only from the members and advance loans only to members. How can these advance loans to entities listed in section 2(b) of the bill, if any of them are not members of the society? In many villages, at least one member of every household is a member of the village cooperative credit society. It is not clear if the recognition of such an institution as a microfinance organisation would not mean dual control by the registrar of cooperatives and directly by NABARD. And, such a cooperative may be helped with state grants to have own funds to the value of Rs 5 lakh! What sort of cooperatives are these going to be under the circumstance? The messy grouping of various organisations as microfinance organisations under the bill is illogical. The exclusion of the RBI as the regulator of all financial institutions that accept deposits and disburse loans, in case of the trusts and societies, is strange.

### **Trust and Societies Acts**

The main organisations sought to be recognised as microfinance organisations are trusts and societies under the

respective central or state acts. It appears that some of these trusts and/or registered societies have not only sponsored SHGs but have been functioning in effect as micro finance organisations. But there is uncertainty and ambiguity in the matter. The Trust and the Registered Societies Acts specify "charitable purpose" (besides, religious, scientific, and cultural) as an object of the institution. But, the expression "charitable purpose" is not clearly defined in the acts. Certain trust acts, like the Maharashtra or Gujarat Act define "charitable purpose" to include relief of poverty or distress, education, medical relief, and the advance of any other object of general public utility. The last clause has been sought to be clarified through specific inclusions or exclusions in the acts. Thus, the Gujarat Act specifies that general public utility does not include a purpose which relates exclusively to sports or exclusively to religious teaching or worship. The Maharashtra Act explicitly states that charitable purpose includes provision for facilities for recreation or other leisure time occupation (including assistance for such provision), if the facilities are provided in the interest of social welfare and public benefit, and in the advancement of any other object of general public utility. But, it does not relate to purposes relating exclusively to religious teaching or worship. The act makes it clear that the "interest of social welfare" shall be

satisfied only if the facilities are provided with the object of improving the conditions of life for the persons for whom the facilities are primarily intended, and those persons have need of such facilities as aforesaid by reason of their youth, age, infirmity or disablement, poverty or social and economic circumstances, or if the facilities are to be available to the members of the public at large. Similarly, "relief of poverty and distress" applies in particular to the provision of facilities at village halls, community centres and women's institutions, and to the provision and maintenance of grounds and buildings to be used for the purposes of recreation and leisure time occupation, and extends to the provision of facilities for those purposes by the organising of any such activity.

I have referred to the scope of the expression "charitable purpose" in these two Acts at length, in order to draw attention to the fact that the expression is not self-explanatory and the law only makes explicit certain inclusions or exclusions relating to it, from time to time. By and large, therefore, the expression is subject to the interpretation by the charity commissioner or the concerned government department (where there is no charity commissioner) and ultimately by the court of law. I learn from certain Non-Governmental Organisations (NGOs) in the field that the

charity commissioners or concerned government departments in different states have, by and large, not allowed extension of loans to the poor -bearing or not bearing interest, acceptance of deposits or thrift from poor beneficiaries and seeking of loans from banks to provide loans to the poor and recover the loan amount with interest, as routine activity of a trust or a registered society, as a part of its activities under "charitable purpose". In some cases the charity commissioner has allowed some of this activity by the trust or society on a one-time basis. To repeat this activity, a change statement and fresh permission is required, which of course is a very time consuming process. But, I was told by such NGOs, that it is possible that some trust or society, having once obtained such permission from the charity commissioner/relevant authority, does not go back for a fresh permission, but carries on as if it has a permanent permission.

Under such circumstance of ambiguity and uncertainty relating to trusts and registered societies, some NGOs in this field thought of registering themselves as companies under section 25 of the Companies Act. Such institutions cannot accept deposits. Some of them circumvent this by accepting deposits under other names, like security, etc., and carry on lending operations.

Private limited companies under the Companies (Amendment) Act, 2002, (Act No 1 of 2003), section 581 (A to Z) is another device that can be used for the purpose. This Act requires at least 10 individuals or groups (incorporated or unincorporated) or a combination of the two types to form such a private limited company with specified share capital. The liability of the shareholders in such a company is limited to their paid up and unpaid share capital. The company is to carry on its business mainly (if not exclusively) with its members. (Section 581 B (2): Every Producer Company shall deal primarily with the produce of its active members for carrying out any of its objects specified in this section.) In the Act a "producer company means a body corporate having objects or activities specified in section 581B and registered as Producer Company under this Act". There are 11 objects specified for such a company in section 581B (1). The object of a producer company shall relate to all or any of these. Two of the first 10 objects listed in the Act are: "(d) providing education on the mutual assistance principles to its members and others"; and "(h) promoting techniques of mutuality and mutual assistance". The 11th objective states: "(k) financing of procurement, processing, marketing or other activities specified in clauses (a) to (j) which include extending of credit facilities or

any other financial services to its members". Reading these above quoted three objectives together should make it clear that a company registered under this Act's provision can accept deposits from its members, provide loans to them, at specified interest rates, and also borrow funds from banks to meet a part of this activity to be discharged in the interest of its members. The voting rights of its members are similar to a cooperative when there are individual and group members, that is, one vote for every member, irrespective of share capital or patronage (which means participation in the main business of the company by the member). So is the distribution of the profit or final price received net of costs. The dividend on share capital is nominal, to be determined by the board of directors or specified in the by-law. The bulk of the profit is to be distributed in proportion to patronage. All these make it clear that such a company shall function exactly like a cooperative credit society. But there appear to be some difficulties. From the point of view of such a company functioning as a microfinance organisation for its members, the difficulty appears to lie in the reported decision of some registrars of companies at the state level to prohibit such a company from accepting monetary deposits from its members. To my understanding, this is not right.

### **Difficult Procedure**

Another difficulty with the use of this Act by the SHGs or their members is even more disturbing. It is necessary to note here the type or class of persons for whom this new section has been inserted into the Companies Act. They include those engaged in agriculture, horticulture, floriculture, fishing, viticulture, forestry, collection of forest produce and marketing, bee-keeping, and other services which promote the interest of farmers or consumers. It would be clear from this that such persons are most likely to be ordinary, often illiterate persons and of course not very moneyed people. For such people, the procedure followed is extraordinarily difficult and beyond their capacity. Firstly, not only the Act but the model by-law framed for such a company is in English. The annual report to be submitted to the registrar of companies is to be in English. The registrar's office does not bother to provide a regional language version of these documents for the understanding of the intending members. The reports and other documents have to be electronically filed not an easy or inexpensive task for such companies. At least one director has to have a digital signature, which costs Rs 3,000 to obtain. Other directors also need electronic director identification which too is hard to obtain for semi-literate directors. There are many other problems

and delays in filing documents electronically. There has to be a full-time manager right from the beginning and he has to be a non-member, an outsider. Until the company begins operating at full steam at its proper scale, this is a very difficult and expensive requirement.

One gets the impression that the companies sought to be helped by this section inserted at the end of 2002 are, for procedural matters, being treated as the general run of corporate entities, not to mention Multinational Corporations (MNCs). The result: the procedures prescribed make this Act a cruel joke. It is necessary for the ministry to clarify the ambiguities, or amend the Act to accommodate such institutions, if found necessary, provide all forms, by-laws and other documents in the regional languages, and not insist on the expensive electronic and digital requirements, if the party cannot afford them. The ministry should make it possible for these companies to function as microfinance institutions (that is,, like the primary cooperative society) for its members.

From the above discussion, it appears that the new bill is trying to empower trusts and registered societies to overcome the difficulties in their way of functioning as microfinance organisations. It is not quite clear that this is going to overcome all legal-technical

difficulties in the way of the trust or registered society from functioning as microfinance organisation. Conflict of interpretation might arise if the provisions of this bill supercede anything in the central or state acts relating to trusts and registered societies. One cannot understand how the RBI can be kept away from regulating such financial institutions that accept deposits and lend money to anyone, which are in essence the functions of a bank. Nor does it make sense to introduce a new financial institution when a proper cooperative act at the state level and/or a clarified section 581 of the Companies Act at the central level can meet the needs of the situation, without cluttering up the institutional and regulatory scene.

Section 2(f) states: "microfinance services' means

(i) providing financial assistance to an individual or an eligible client being under any of the sub-clauses (i) to (vi) of clause (b) either directly or through a group mechanism for (A) an amount, not exceeding rupees fifty thousand in aggregate per individual, for small and tiny enterprise, agriculture, allied activities (including for consumption purposes of such individual), or (B) an amount not exceeding rupees one lakh fifty thousand in aggregate per individual for housing purposes; or (C) such other amounts, for

any of the purposes mentioned in items (A) and (B) above or other purposes, as may be prescribed."

In view of the condition in C above, it is difficult to understand the necessity of A and B.

Section 2 (f) (ii) states: (microfinancial services means) "financial services to an eligible client or individual borrower under any of the sub-clauses (i) to (vi) of clause (b) through the business facilitator or business correspondent mechanism authorised by the scheduled banks or any such other agency as may be permitted by the Reserve Bank of India". Now, it appears from this that a scheduled commercial or cooperative bank can "authorise" a "business facilitator or a business correspondent mechanism" to provide financial services.

### **Business Facilitators**

The "business correspondent" (BC) in the RBI scheme, in addition to the functions of the business facilitators (BFs), shall do the following: disbursal of small value credit, recovery of principal/collection of interest, collection of small deposits, sale of micro insurance and mutual fund products, receipt and delivery of small value remittances. The entities which can be authorised as BC are NGOs/microfinance institutions

(MFIs) set up under societies/trust acts, societies registered under Mutually Aided Co-operative Societies Act or Co-operative Societies Act of States, Non-Banking Financial Companies (NBFCs) registered under section 25 of the Companies Act and post offices. In their case too a reasonable commission will be paid by the bank to the BC, but the BC cannot charge any fee to the client. As in case of BFs, all omissions and commissions by the BC shall be the responsibility of the bank.

Most commercial banks, particularly the public sector banks, have not been very enthusiastic about these provisions, particularly the business correspondent device. There is a stipulation of about 11.5 to 13 per cent as interest (the PLR of the bank) to clients out of which the commission is to be paid to the BCs. Since the interest on deposits varies from 4 to 9 per cent, there is very little margin to be shared on a reasonable basis with the BCs. The BC model had been initiated by some private sector banks, like the ICICI Bank, before the RBI Committee formulated its scheme. In this, the ICICI Bank advanced bulk credit to the BC and charged between 9 and 11.5 per cent interest (till October 2006) and the BCs were free to recover a service charge of between 9 and 20 per cent in addition,

making the total annual interest to the client about 30 per cent or more. The RBI scheme appeared unattractive to the BCs.

In the light of this account of the BFs, and particularly of the BCs recommended by the RBI, two points stand out in regard to the provisions of the bill under discussion. Firstly, the microfinance organisations to be certified by NABARD are to be mainly trusts or registered societies and they can function through BCs authorised by a commercial bank, which in turn will also be trusts or registered societies. The cluttering up of microfinance institutions is clear from this. Secondly, the banks are not enthusiastic about the RBI's business correspondent scheme since there is little margin in it to be shared with the BC. In point of fact, the rural branches of commercial banks are not very enthusiastic about the collection of small deposits from rural areas and the operation through these entities, since very little savings today come their way. Some branches of the State Bank of India said that hardly 2.5 per cent of their total deposits are from such rural clients and it is not worth the bother for them [Tankha 2006]. In the light of this it is difficult to understand why the finance ministry, presumably advised by the RBI and NABARD, has brought forward such a bill.

Section 2 (1): Thrift has been defined as follows: "'thrift' means any monies collected (other than in the form of current account or demand deposit) by a microfinance organisation from a group or by a group from its members through the group mechanism, not exceeding such amounts and subject to such other terms and conditions as may be prescribed". In the first place, the meaning of current or demand deposit is not clear insofar as societies and trusts are concerned. They are not banks. Secondly, while SHGs are essentially thrift societies, the trusts and registered societies are not thrift institutions. The only thing they can do, as per the bill, is accept from the self-help groups their thrift deposits as deposits and extend loan to them, if such groups seek them. It is not clear if the trusts and societies can accept deposits from individuals. If they can, then how does one draw the distinction between thrift and deposits in the case of deposits by such individuals? The amount that people keep, habitually or even occasionally, with their SHGs or their cooperative credit society is their thrift or savings. There are no nonmembers in such organisations and no depositors except the members. Then, what is this distinction relating to thrift? Is it to accommodate the trusts and registered societies who will be entitled to render microfinance service, without membership like in case of self-help

groups and who, it appears, can accept deposits from anyone, without being banks? This is utterly messy, to say the least.

Sections 8 and 9: NABARD appears as the sole organisation whose certificate is necessary to start a new microfinance organisation, be it a trust or a registered society or even a primary agricultural cooperative credit society. Only the existing trusts and registered societies can continue to function as they are doing at present if they choose not to be so certified. Presumably, the primary agricultural cooperative credit society can continue to function as at present since it is registered with the registrar of cooperatives.

The remaining provisions in the bill relate to the upper organisational structure governing the microfinance organisations, a special fund with NABARD to help these organisations with donations towards their "own" funds (more scope for political patronage?), refinance, training and research, the provisions relating to certification of microfinance organisations and cancellation of such certificates, fines in case of violation of rules by such bodies, etc. The clear picture that emerges is the overriding authority of NABARD in all such matters, not a mere regulatory body, but 'sarve-sarva' (all in all).

One part of this bill is intriguing. Section 32 states: "Provisions of the Act to override other laws: The provisions of this Act shall have effect, notwithstanding anything inconsistent therewith contained in any other law for the time being in force or any instrument having effect by virtue of any such law". But, three other articles later, article 36 states: "Application of other laws not barred: The provisions of this Act shall be in addition to, and not in derogation of any other law for the time being in force". One is left wondering what anyone, including the courts of law is to make of this.

This bill is an entirely unnecessary device to help the poor who have been organising themselves into small or large rural SHGs. The help they need can best be given by having a suitable legislation for their registration as co-operatives, which will give them a legal identity which is what they need to park their funds with a bank and borrow from a bank. For such small SHGs, the cost of maintaining savings and the cost of extending loans to members will not be large, certainly much less than what microfinance organisations working in the field are found to incur. These self-help groups, whether registered as a co-operative or not, can also form a private limited company under article 581 (A to Z) of the company (Amendment) Act, 2002, to facilitate their borrowing from



commercial banks. No new institutional device appears necessary. Poor individuals who are not yet part of a SHG can quickly form one to facilitate their own borrowings and bank loans.

### **Some Policy Issues**

The discussion above has been confined to the institutional structure for microfinance to the poor households in rural and urban areas. But I wish to add a point about the policy relating to lending money to SHGs. The SHGs are basically thrift institutions of the poor. Their individual member's loan requirements are limited. The responsible SHGs are very careful in lending money to their own members. They help, advise and supervise their loan to their own members so well that banks, I think, would like to learn the essentials of supervised credit from them. This is because the deposit money is theirs and each one of them has a stake in it. At any time, loan fund in excess of what the group's own savings permit, will be as effectively supervised provided the amount does not form an overwhelming part of the total advance by the group, such that the advances from their own funds become a small or negligible part of the total advances. In such a situation, sooner than later the members will become less careful about the disbursement and supervision of loans to their own members, since their stake in

the funds advanced will cease to be significant. This is what has happened to the primary cooperative credit societies in the country. A policy of "helping" the SHGs with disproportionately large loanable funds will ultimately lead the SHGs to the same fate. Therefore, as a rule of thumb, no self-help group should be provided with external loanable funds which is more than 50 per cent of the total advances by the group to its members during the year. This alone will preserve their character and allow them to grow slowly yet steadily.

Moreover, the interest rate at which such external funds should be provided should be some 5 to 6 per cent lower than the rate at which the group provides loans to its members, not an administratively predetermined rate. Both these measures will help the group to preserve and promote its mutuality and responsibility. I have seen SHGs of poor, including tribals, where the group has dissuaded its members from incurring high loans to meet family expenses, like wedding or death rituals. I have also seen self-help groups of poor women who so carefully schedule loans to their members for productive purposes that at no time is there a very large outstanding debt; and the groups allow their members to redesign or reschedule investment plans. We should not kill such sound institutions by our "help" with abundant cheap funds.

It is futile to think that many, if not most, poor people in our villages can be transformed into able entrepreneurs with high levels of income, through the mechanism of microfinance organisations and cheap, plentiful loanable funds.

The trusts and societies which have been helping such groups should be left free as they are at present, and should not be converted into agents of NABARD with "own" funds and refinance. I will not be surprised if most of such genuine trusts

and societies in this field would be unwilling to become a part of the device under the proposed Act. It is only the fly-by-night type of institutions that will be promoted through the proposed device.

#### Reference

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## MICROFINANCE REGULATION BILL: A REJOINDER\*

Nilakantha Rath

*It is inappropriate to make trusts or registered societies or cooperative credit societies function as wholesalers in a regime of microfinance institutions. It is better to provide the self-help groups and their federations with statutory status under a liberal cooperative law. This would be the proper approach to extension of credit to such elements in the rural society.*

came to learn about and read, only recently, the discussion note 'Misplaced Critique of Microfinance Regulation Bill' (January 19, 2008) by P Satish, a senior executive at the National Bank for Agriculture and Rural Development (NABARD). I find that he does not take up the basic issues raised in my article about the Microfinance Regulation Bill's provisions.

### The Critique

First, Satish severely attacks me on three points: (i) My ignorance about the initiation of self-help groups (SHGS) in India under the aegis of NABARD only about two decades ago, when I mention that SHGS started in India some three decades ago; (ii) My ignorance that the SHGS were being recorded in their own names and serviced by some commercial banks even before the Reserve Bank of India (RBI) issued a circular to the commercial banks saying they can do so without difficulty (in two stages in 1994 and finally in 1996); and (iii) NABARD's

proposed role in regard to the microfinance institutions in the Bill is no different from that of the RBI with respect to the commercial banks and other financial institutions, and I am attacking the provisions relating to NABARD's role, while keeping quiet on the role of the RBI.

Second, the article also, incidentally, suggests that there is no necessity of providing a statutory status to the SHGS, since they do not accept deposits from non-members. He also points out that the Vyas Committee and such others have suggested that microfinance institutions, like non-banking financial companies (NBFCs), should work as wholesalers of credit to SHGS.

He has nothing to say about the provisions in the Bill about the intended role of registered societies and trusts and cooperative societies as "wholesalers" of credit to individuals and SHGS. That I think was my main point of criticism of the Bill.

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\*Source: *Economic & Political weekly*, Vol. 43, No. 19, May 10-16, 2008, pp. 84-85.  
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I would react to his points in the following way:

### **The Response**

I may be in error in thinking that the SHGS started in India roughly some three decades ago. Surely, till the end of 1986, when I ceased to be a member of the NABARD board, I had not read in any document placed before the board or heard any mention of SHGS in India or elsewhere. In that year, in private conversation, a senior officer of NABARD said that he was going to visit Bangladesh to see and understand the Grameen Bank system, which, of course has nothing to do with SHG, which, I understand is a result of German suggestion. Much later, in the early 1990s, I saw many SHGS in Malappuram and in Alleppy town in Kerala. While the SHGS in Malappuram were of rather recent origin, the SHGS in Alleppy were much older. Subsequently, in course of conversation with different friends working in tribal as well as non-tribal areas, I was told that some self-help group type organisations had been promoted in some areas by nongovernmental organisations (NGOs) quite early in the 1980s. Therefore, to be on the safe side, I mentioned three decades. In any case, I do not see that this is a relevant point in my critique of the Microfinance Bill.

From my personal experience, I learnt that banks in India would not agree to open accounts in the name of associations which were not registered under one or the other law. Until recently, I did not know that there is no legal bar to unregistered associations of individuals being recognised for such purpose, and some laws, including the Income Tax Act, permit this. Therefore, it appears that the RBI only reiterated what was there in law and brought it to the attention of the commercial banks. Surely, as long as the banks are willing to entertain the deposits of the SHG and extend credit to the SHG as a group, without such statutory status, there may be no problem. But, in such a situation, the liability of the individual members is not limited, unlike in case of most associations registered as cooperatives. And, that may create problems for both the bank and the members of the SHG. Hence the need for statutory status. Indeed, many SHGS have preferred to be registered as cooperative societies under the new liberal cooperative laws or even the older laws or as other associations.

That a regulator of a particular type of institution should also not be promoter or participant in the formation of such institutions is a well accepted principle. But, this is what NABARD is proposed to do in the Bill; indeed, the chairman of NABARD had already made an announcement to start many SHGS. As

for "donations", the provision is there in the Bill for NABARD to give outright grants to trusts/registered societies to bring their total capital to a specified minimum. As for the RBI's role in regard to commercial banks, I was not writing about the RBI's role in relation to microfinance institutions or any others, but about NABARD's stipulated role with respect to microfinance institutions. That was not the occasion for me to examine RBI's role regarding commercial banks.

From the above, it should be clear that I did not "misrepresent" anything or try

to mislead anyone as regards the contents and contentions of the Microfinance Bill. My main contention was and is that it is inappropriate to make the trusts or registered societies or cooperative credit societies function as wholesalers in a regime of microfinance institutions.

It is better to provide the SHGS and their federations statutory status under a liberal cooperative law. That would be the proper approach to extension of credit to such elements in the rural society. The author of the present critique of my paper has chosen to be silent on these basic issues and contentions in my paper.

## IMPLICATIONS OF THE LOAN WAIVER FOR RURAL CREDIT INSTITUTIONS\*

NILAKANTHA RATH

*The loan waiver will lighten the debt burden of the farmers. But in the long term this will adversely affect the rural credit institutions that extend loans to farmers. A discussion of the likely fallout.*

In his budget speech on February 29, 2008 the union finance minister made a number of proposals for expenditure on education, health and agriculture. However, this did not attract much attention from the media or the public and politicians. The one item on which attention was focused was the writing off of loans amounting to Rs 60,000 crore, mainly to small farmers, from credit institutions. Within a couple of days of the announcement, the prime minister and the Congress president proclaimed it a revolutionary step. The finance minister followed by forecasting that this would lead to a revival of growth in farm production.

A government announcement says that agricultural loans (including interest) to farmers cultivating up to two hectares (or about five acres) of land given by cooperative credit societies and commercial banks that were outstanding on March 31, 2007 shall stand written off. Only 25 per cent of the total outstanding agricultural loans to farmers holding more than two hectares of land on that date shall be

written off. Following this, farmers in different regions raised their voices asking for the conversion of loans from private moneylenders into lower interest-bearing bank loans, which should then be written off. The union minister of agriculture has gone about advising farmers, in his public meetings, to refuse to repay loans taken from unregistered moneylenders. If the moneylenders create trouble, the union government, he said, would advise the state governments to ask their police to take care of such moneylenders.

The news media has made three observations: (i) this step has been taken keeping an eye on impending elections; (ii) where will the government find the money? and (iii) what about non-agricultural loans? No one appears to have raised any questions about the possible consequences of such waivers on rural credit institutions and the agriculturist class.

Writing off agricultural loans is not new in our country. The union govern-

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ment under the prime ministership of V P Singh made a similar announcement in the budget of March 1990. While the union government was to compensate commercial banks for the writing off of all agricultural loans, the responsibility of compensating the cooperative credit societies was to be shared equally by the union and state governments. During the last three or four decades, some state governments have made similar announcements some time or the other. This has not been done only once in the past. The cultivators have assumed that this will happen from time to time.

### **State of Rural Credit Institutions**

After the declaration in March 1990, there was a decline in the availability of agricultural loans from cooperative credit societies and commercial banks. The reasons were many. The governments were not in a position to compensate the credit societies or banks for the write-off at one go: it took a number of years. Therefore, those individuals or societies, which had still overdues could not have access to fresh loans. Those cultivators, who had already repaid their loans before the announcement, felt cheated and therefore, were reluctant to repay their fresh loans. Those who had benefited realised that such a write-off will occur from time to time and therefore, were unenthusiastic about repayment.

Besides, there were either droughts, floods or cyclones leading to failure of repayment. To add to these circumstances, the new economic policy announced in 1991 emphasised the profit performance of the state-owned commercial banks and reduction in their non-performing assets, which led to reduction of agricultural loans given by commercial banks. The survey by the National Sample Survey Organisation (NSSO) in 2002 showed that, except in states like Gujarat and Maharashtra, where cooperative milk marketing unions and cooperative sugar factories had a large role, institutional credit to agriculture had greatly declined.

Institutions like the National Bank for Agriculture and Rural Development (NABARD), instead of taking steps to revive the agricultural cooperative credit institutions, took greater interest in the newly emerging self-help groups in rural areas. Finding that these bodies, coming up largely on their own or on some non-government organisations' initiative, were successfully collecting small savings on a regular basis from their members and providing loans to the needy amongst them from out of such savings, NABARD decided to increase the supply of rural credit by supporting such institutions by providing them with massive cheap loans.

The Planning Commission, finding that the rural cooperative credit institutions, which had over the preceding five decades helped agriculture with large scale loans to finance production as well as capital investment, were not performing well, set up a committee to recommend steps to revive such institutions. That committee (the Vaidyanathan Committee) came to the conclusion that the only way to revive rural cooperative credit institutions would be to free them from government share capital and all types of state financial help and loans as well as from the government staff who run them, thereby making them, in effect, completely member-driven institutions. In order to free the cooperative institutions of the financial involvement of the state in them, the committee suggested a financial provision of about Rs 14,000 crore to repay the state governments their financial dues. There was also an obligatory recommendation to amend the cooperative laws in the states along the lines of the model draft law prepared by the Brahma Prakash Committee of the Planning Commission. The prime minister and the finance minister accepted these recommendations of the committee.

But, from the provisions in the memorandum of understanding signed by the union ministry of finance, NABARD and the state governments, specifying the

steps to be taken by the state in order for the union government to release the estimated money, it appears that under the new arrangement, the state government can subscribe up to 20 per cent of the share capital of the cooperative institution. If the existing cooperative law cannot be amended along the lines recommended, then a new parallel law along the suggested line should be passed to enable intending institutions to register under it. If this is done, the state can receive money, as per the recommendation of the Vaidyanathan Committee, to revive the existing cooperative credit institutions. From this, the extent to which the recommendations of the committee to revive the cooperative credit institutions have been carried out by these memoranda of understanding would become clear.

State-owned as well as private commercial banks are reluctant to extend credit to the large number of small farmers in the country as the banks find that the cost of extending credit to small farmers is turning out to be far greater than the interest the bank can earn from such loans. As a result, many commercial banks have begun extending credit through self-help groups and mainly through private microfinance institutions in rural areas. In addition, the union government is anxious to give legal status to such microfinance institutions.



From the above brief account, it should be clear that the government no longer appears to have great trust in the ability of cooperative credit institutions to directly provide loans to agriculture. There was some hope in the revival of cooperative credit institutions, if the Vaidyanathan Committee's recommendations had been fully accepted that has not happened in effect. Add to this the present write-off of loans. Consequently, over time, the cooperative credit institutions will remain only in name. As for commercial banks, instead of at least withdrawing the state-owned commercial banks from directly financing agriculture and handing over this task to local (district) level commercial banks, the policy now is to hand over this task to private microfinance institutions. What the consequence of the write off of loans will be on such credit institutions in the future remains to be seen.

That leaves the self-help groups. These small bodies were and are collecting regular savings from their members and advancing loans to the needy amongst them from such savings in order to meet their occasional expenses. But now one finds that in many states, banks are repeatedly going to self-help groups and suggesting to them that they can and should take loans up to almost four times their total savings and give these to their members and the state government will

thereupon give an outright subsidy of up to Rs 50,000 to such groups. Under such persuasion and pressure, it remains to be seen how long these self-help groups will be able to keep a sharp eye on not only their collection of savings but also the disbursement and repayment of loans to their members. Cooperative credit societies had been built precisely for this purpose. But, gradually, of the total loan advanced by the primary agricultural credit societies, four-fifths or more came from outside institutions - in the language of the villagers, government funds and the rate of interest charged to the borrowers was often less than the rate of interest paid on term deposits by commercial banks. Consequently, the members of the cooperatives realised that they had little stake in these loans and therefore, did not see the necessity of careful supervision of the advance of loans as well as their recovery. There is legitimate ground to fear the same fate for self-help institutions. Since the bulk of the loans will be from outside institutions, there is a strong possibility of the demand for writing off loans in times to come.

### **What Can Be Done**

In the present system of organisation and operation of rural credit institutions, the not-too-distant consequence of the waiver of loans has been and will be the

demise of the people's own credit institutions. Today nearly 85 per cent of cultivators in India have less than two hectares of cultivated land, and they cultivate a little less than half the total cultivated area. Many commercial banks find it very expensive and difficult to advance them loans for agriculture, supervise utilisation and recovery. The NSSO survey of 2002 shows that the situation is gradually becoming similar to that of the moneylender-times of the past. There is reason to fear that this will become worse in the years to come. If these small farmers can form their own credit institutions and mainly with the help of their own savings supplemented by limited loans from banks, can manage to carefully supervise the sanction, utilisation and recovery of loans, there is a fair chance of the survival of their families and growth in their agriculture. This will not only teach them how to run their own institution but also generate strength and confidence in their own ability. One reason for the inadequate progress in the direction of democratic values and institutions in our country is the old feudal attitude of depending on subvention from the superior. In order to be able to stand on one's feet, understand what is in one's best interest and proceed in that direction and understand if the different state institutions are doing the tasks properly in our interest, one must first have the experience of running one's

own business as well as the collective enterprise of the group properly. That will train us to become proper citizens of a democratic polity. It is sad that our government, instead of passing laws to help form such institutions and enabling them run in the proper direction, is busy destroying them and making us suppliants as in feudal times. It is important for our government, political parties and the intellectuals to realise that what we are doing in order to help the people is in reality axing at the base of the people's effort to stand on their own feet.

### **Farmers' Suicide and Debt**

Someone who has read so far might think: you seem to be more worried about the demise of people's institutions and not about the suicide by poor farmers due to the unbearable burden of debt. In fact, I have not come across investigative reports into the real reasons for the suicides of farmers in different states during the last four or five years. Fortunately, I have just read an investigative report into the suicide by 116 sample farmers in the Vidarbha region of Maharashtra during 2004 by the Indira Gandhi Research Institute of Development Research. The report gives, in brief, the personal, family and landholdings accounts of every one of these 116 cases. From this, it appears that at most 41 of them (or 35 per cent)

and at the least 17 (or 15 per cent) committed suicide due to loans taken for agriculture and were faced with re-sowing once or twice due to early failure of the rains. Twenty-four of these 41, that is, 20 per cent, had of course taken loans for farming and were faced with the need to re-sow once or twice due to failure of the rains but they also incurred heavy loans for weddings or treatment for sickness. The remaining two-thirds (65 per cent), of course, were under the burden of debt but that appeared to have little to do with agriculture. Some of them appeared to have spent the borrowed funds on liquor. Some others borrowed for weddings beyond their ability to repay and finally committed suicide. About a tenth of the sample cases appeared to be mentally imbalanced or suffering from a mental disorder and possibly committed suicide under its stress. Many others committed suicide due to family or unknown, unstated reasons. Some were landless agricultural labourers. The individual details show that they suffered from a debt burden but there is nothing to suggest that it had anything to do with agriculture.

Suicides due to loans taken for weddings or other family reasons are, of course suicides due to debt. But even if these can be or are written off, such waivers cannot be the solution to this problem. Suicide due to debts incurred

for family reasons is not new but writing off the debt cannot be the solution to this problem either. It is necessary to help farmers suffering due to bad weather, poor quality seeds or a fall in the price of the farm product in the market. Farmers adversely affected by unfavourable weather and without crop insurance should be helped by writing off loans taken for the second or third sowing and the interest on the original loan and in case of crop failure in consecutive years, by a thorough waiver of the initial loans. The RBI, NABARD and the government should have institutional arrangements for this. While the government announces a minimum support price for many agricultural commodities, there is often no institutional arrangement to purchase the produce from farmers at the stated price. That must be provided. The sale of fake, unsuitable seeds and insecticides in many areas for particular crops should be stopped. The officers of the state's extension agency should repeatedly visit the villages to warn farmers against this; simultaneously, steps should be taken to prosecute and jail traders indulging in these practices. These cannot be achieved by writing off loans. There can be many ways of preventing and fighting these very sad cases of suicides, but it is a mistake to think that writing off loans at one go can be a single step solution. It will, of course, not lead to a decline in the number of cases of

suicides. On the other hand, it would lead to a gradual demise of the people's own institutions like the cooperative credit societies and self-help groups. The only agencies left in the field will be the village moneylenders and their institutional brethren the microfinance institutions.

It is true that the present massive writing off of agricultural loans will bring some relief to many farmers but no one appears to think about the long-term consequence of this. So, in the end I would like to draw the attention of the government, political parties as well as the concerned public to this fallout.

## **SUBMISSIONS RELATING TO THE DRAFT FOOD SECURITY BILL, 2011**

Nilakantha Rath

1. This Bill provides for very cheap cereals to 75 per cent of the rural population and 50 per cent of the urban population in the country. These proportions are for the present only. The central government reserves the right to specify these proportions, at the state level from time to time.

2. The persons in the Priority Households (forming 46 per cent of the 75 per cent rural households and 28 per cent of the 50 per cent urban households) shall be entitled to 7 kg. of cereals every month at Rs 3/2/1 for rice/wheat/coarse grains, respectively. Persons in the other households, called General Households, in these 75/50 per cent households, shall receive 3 kgs. of cereals at not more than 50 per cent of the Minimum Support price of wheat/coarse grains and the adjusted price of rice per month.

3. In effect, in an average sized household of 5 persons, a Priority Household shall receive 35 kg. of wheat/rice at Rs 70/105 per month (coarse cereals, like Jowar/bajra are not purchased by the state under the MSP arrangement, and may therefore be ignored). This amounts to approximately 3850 k.calories per day for the average household or 770 k.calories per person per day.

4. Besides this, all children, 6 months to 6 years of age, of every household in the rural areas as well as in urban centres, shall receive free food or take-home ration, providing 500 k.calories per day the year round. And children going to school, aged +6 to 10, shall receive free food providing 500 k.calories per school day and children +10 to 14 years of age free food providing 700 k.calories per school day. All pregnant and lactating mothers shall receive free ration providing 500 k.calories per day for 15 months.

5. Assuming in an average household there are two children below +6 years of age, the household would not need significant food for them the year round. And for half the year there will be only half a child of age +6 to 14 to be fed at home. So, it means that the cheap 35 kg. cereals will be required for 2.5 persons in the average household, without taking into account any pregnant woman in it.

6. This means, the cereals, costing Rs 70/105, will provide on an average 1450 k.calories per day per person to the Priority household. Compare this with the calorie requirement of an average Indian on the Poverty Line, as stated by the Tendulkar Committee Report of the Planning Commission: a little less than 1800 k.calories. It means that such an

average household will get its total calorie need from cereals from this virtually free cereal supply.

7. The opening sentence of the Bill, stating its objective, says, this is being done to enable such people to "live life with dignity". Surely, our government does not think that providing year round free food ( not entirely free, but for 1200 rupees a year per household) to 46 per cent of our rural families is a way of making them live with dignity! More than 100 years ago, when normal conditions were much harder than today, in periods of acute famine, ordinary people in the hungry households preferred to die than go to anna-chhatra (free food centres). In sixty years of Independent India we seem to have reduced people into beggars!

8. Worse contradiction is still there. In the last annexure to the Draft Bill there is a statement that the long term objective of the Bill is agricultural development. But, if the Ministry in Delhi has its eyes and ears to the ground in the states, it must have received information that where people are being provided these 35 kg. per month, at Rs 70/105, there is report of unwillingness of farm labourers to come for wage work, leading in some situations to some land remaining uncultivated.

9. People in rural India are poor and hungry because they do not have enough work to earn a better living. What is required is provision of job for people where they can put in work to earn a better living. The MGNREGA guarantees 100 days of work, at specified wage, to a poor household. Simple arithmetic shows that a poor household of 5 persons with two earners will be able to get the poverty line income for the household if the two earners are provided work for 250 days each, with the wage rate equal to the poverty line income for the household divided by 500 days. [I am attaching a note of mine in which, amongst other things, this is calculated in detail.] The state's responsibility is to find out such public works, create organisation for such 3 works and provide the funds for it. The workers' responsibility would be to do the work to earn the wage. That would be a dignified way of earning a better living. For this, the state does not have to visit households to identify if it is poor. Any villager who is willing to work in such public works should be welcome. The households will then be able to buy the food grains of their choice either in the fair price shops or in the open market.

10. A final point about proper storage of cereals by the state. It is a shame that after 60 years of storing and distributing huge quantity of food grains and carrying

buffer stocks over years, the state has failed to devise proper storage facility, resulting in huge loss of grain in storage. The government of the United States of America stored routinely huge quantities of grain under its price support scheme, from which India for long was recipient of grains under PL 480. These were stored and transported in bulk. The PL 480 grain had seeds of certain weeds in it, but there was never any complaint about damp or rotten or worm infested grains delivered to India. We should have learnt how to build and operate these storage bins, not only at the limited purchase centres but also in almost all district places, since the grain godowns for fair price shops are there in all districts of the country. Better late than never!

# **ECONOMIC USE OF FLOW IRRIGATION WATER - A COMPLETELY NEGLECTED SUBJECT IN INDIAN AGRICULTURAL POLICY**

Nilakantha Rath

Indian agriculture is in a very difficult situation. I am not referring to the current threat of drought, which is a periodic phenomenon. After almost two decades of spread of high yielding rice and wheat, the overall growth rate of production in Indian agriculture has not been very encouraging. The situation is peculiar: while there are huge buffer stocks of rice and wheat, and sugar production is so high that the price is down and mills cannot pay the cane producing farmers, and stocks of sugar are excessive, India is importing huge quantities of pulses and oil seeds and vegetable oils. While the proportion of the population dependent on agriculture has steadily declined, the absolute number has still increased. This has led not only to a growing number and proportion of the landless wage labour in agriculture, but also to a huge increase in the number and proportion of small farmers, without any great and widespread legal reform in terms of distribution of owned land. Today more than 85 per cent of the cultivated holdings are of less than 2 hectares in size and account for a little less than half the total cultivated land. The larger part of the total cultivated land is dependent entirely on rainfall. Though flood control and irrigation were accepted as two main objects

of planning in agriculture from the beginning, from the sixth five-year plan onwards the Planning Commission drastically reduced public investment in agriculture, which has mainly been on flow irrigation. The reason: the Commission thought that in the light of very heavy buffer stock of food grains, there was no need to make any further investments in agriculture. As a result, whatever the investment took place in irrigation was confined to lift irrigation undertaken by individual farmers with loans from financial institutions. That in many states even half the potential flow irrigation had not been exploited did not matter. There is now a demand for a new Green Revolution, though the possibility of the earlier one being extended to areas that needed irrigation for the purpose is largely ignored. Indeed, the goal of planning most of the time has been to create conditions that would help increase total production of cereals for national self-sufficiency and, if possible, some export. Stability in production on farms across the country and policies and programmes to promote this have been largely a minor object.

A careful review of our policy relating to agriculture gives the impression that



apart from security of tenure to the cultivating tenants, the policy is mainly concerned with provision of cereals for the growing population. In the context of periodic famines and the country's dependence on subsidised imports of cereals that at one stage made us dependent from ship to mouth, this was understandable. The new high yielding varieties had to succeed quickly, and for success it had to be on assured irrigated areas. So, under the intensive area development programme (IADP) such seeds and the necessary fertilizers and other inputs and credit tended to be concentrated in irrigated areas. The policy delivered result in terms of total production of wheat and rice. From a grossly deficit cereal economy we have, during the last two decades, built a huge and continuing buffer stock of wheat and rice. These producing regions remained confined to relatively small parts of the country. That vast agricultural regions and the people dependent on these were left largely high and dry did not receive the attention they needed.

A glaring failure in this has been the failure to design programmes and policies to extend irrigation. For irrigation, the country is divided broadly into two parts. One is the areas with more than 1100 mm of annual rainfall on an average. This area consists largely of the Ganga and Brahmaputra basins and the

plains of the east coast.. Here the potential for irrigation, from surface and underground sources, is adequate or more for all the cultivated land there. For flow irrigation the problems are of a different nature: there is frequent flooding. Floods are not only by the rivers overflowing in the rainy season or changing course. In the rainy season lands get flooded by water flowing from the Terai region in Nepal over the lower land mass in the Gangetic plains. This requires different attention. There is plenty of ground water, but in many parts, control of such flooding is necessary to facilitate exploitation of ground water. Basically, the potential availability of water for irrigation is 100 percent or more; the need is proper technical design of irrigation systems and necessary investment in these schemes.

The second part of the country consists of what are called Dry lands, that is, agricultural lands that receive annual precipitation of less than 1100 mm (44 inches) on an average. These lands are located in the upland peninsular region and regions to the north and west of it. These include lands from the Mahendragarh district in the north to lands in Haryana, Rajasthan, Gujarat, parts of Madhya Pradesh, non-coastal Maharashtra and Karnataka, Telengana, non-coastal Andhra Pradesh and Tamilnadu. The total dry farm land in this region

forms about 44 per cent of the total cultivated lands in India. A very large part of this dry land region receives less than 24 inches of annual average rainfall and are considered famine or drought prone regions. The lower the total seasonal precipitation, the greater its uncertainty in distribution during the rainy season. Poor rainfall implies lower underground water. This is compounded by the underground rock structure. The hard rocks covering the underground peninsular region results in the seeped rain water either flowing down to the streams or seeping through cracks in the rocks, making it very difficult and expensive of access through wells and tube-wells. The long term experience with digging wells in the upland peninsular region has been failure to reach water in about half the wells attempted. The experience with minor flow irrigation schemes in this region is also not very encouraging, since these depend on local precipitation for the water to be impounded. And, under condition of drought when the farm needs water, the irrigation sources are rather dry due to the same reason: inadequate rainfall. This is largely the fate of most of the reservoirs built on small local rivers or streams in this region. During the days of the British administration in this vast region, from the last part of the 19th century till independence in 1947, this was largely the experience with minor and small irrigation projects. Even the

programme of farm ponds, advocated by the ICRISAT much later, did not succeed. The only area of heavy and therefore dependable rainfall in the peninsular region is the crest region of the western ghat mountain. This heavy rainfall is the reason for the large east flowing rivers like Godavari, Krishna and Cauvery and their tributaries that flow through the dry peninsular region. The most dependable sources of water for irrigation in this region, therefore, are these east flowing rivers. With the minor irrigation projects in this region, the important word is minor, not irrigation. Using the waters in the east flowing rivers in this region is the only dependable source of irrigation water for agriculture. Whether this will need major or medium or smaller dams will depend on the sight of the dam, the area that can be irrigated with the help of the water so impounded and the amount of water that should, economically, be provided to each plot of land in the command area. Whether that should be a large dam or a set of medium or smaller dams on the river will and should depend on these considerations.

Unfortunately this has not happened. The pattern of use of water from the reservoirs has followed the pattern, with minor variations, that emerged at the time such flow irrigation schemes were designed and executed in the British times at the end of the 19th and beginning

of the 20th century. At this time, in the peninsular region, the crops under cultivation were fewer than at present. There were very limited oilseeds; groundnut, soybean were not known. The local oilseeds were few. As a pulse, only Tur (Arhar) was used more often as a mixed crop with jowar. The major cereals were jowar, and bajra, and in southern peninsula ragi in areas with a better kharif rainfall. Extension of canal irrigation needed crops that required regular supplementary water in both the kharif and rabi seasons. There was only one crop that fitted this bill; sugarcane. In the southern peninsula, thanks to the north-eastern monsoon, paddy was grown in different times of the year, with supplementary water from local irrigation sources. In a period of five years, one year was a severe drought year. The farmers in the dry region chose to use irrigation only at this time for jowar or bajra or ragi. The result was, the irrigation engineers tried to persuade farmers to use large part of the water every year in sugarcane or paddy. Since the command area of an irrigation project did not cover every farmer in a village (due to the accident of location of cultivated lands), a young engineer, M. Vishweswaraya, went from village to village, in the new Neera irrigation project in the Bombay Deccan, to persuade farmers to exchange at least some of the cultivated land of every farmer, through leasing, such that

everyone can have some land under command. These lands were given water for sugarcane, in rotation. The bulk of the water was used for this crop. What was true for sugarcane in the Deccan Plateau was also true for paddy in the southern peninsula. To use the sugarcane for sugar, private sugar factories were encouraged. This is how in the older flow irrigation systems in the peninsular region, sugarcane and paddy became the dominant users of canal water.

This pattern of use of canal water became the dominant pattern in all old as well as new irrigation schemes on medium and small tributaries of the large east-flowing rivers. After the second world war some farmers in the Deccan, who were cultivating sugarcane with canal water and partly preparing Gur and partly selling cane to sugar factories, realised the great possibility of greater income from their cane if they could set up co-operatively their own sugar factories. With the help of Prof. D. R. Gadgil they set up the first co-operative sugar factory in 1949. Its success encouraged the sugarcane farmers in other canal areas of the Deccan and it soon became the pattern, with tremendous political support. This soon became the pattern in the new as well as old canal areas of the Deccan region of the Indian peninsula.

But, during the first seven decades of the twentieth century the dry agricultural region of the Indian peninsula saw introduction of new crops and gradual change in the underlying demand condition for agricultural products. Early in this period groundnut was introduced as a crop under unirrigated condition, and it caught on during the twenties and thirties despite great fluctuations in its market price. Short staple cotton had begun growing in the Central Provinces and Berar as well as in the dry lands in Bombay Deccan in the later part of the 19th century. Its long staple variety caught on under irrigated condition. Wheat tended to be grown as a Rabi crop under irrigation. In the post second world war years new crops were introduced in the peninsular region: hybrid jowar and bajra, with much higher yield under irrigated conditions were successfully introduced. Soybean became a successful oilseed, both under irrigated and unirrigated conditions. Groundnut under irrigated conditions were seen to yield much more than on dry lands. Other pulses than tur (arhar) were found to be better performing under irrigation. With expanding urbanisation and demand, fruit crops like grapes, pomegranate and banana started growing. Except banana, none of these crops required more supplementary irrigation than the traditional cereals like jowar and bajra. The market for vegetables increased with rapid growth of cities

and towns. In brief, the agricultural scene and possibilities had become vastly different from the one that young Visweswaria faced in the beginning of the twentieth century.

But, the surprising and sad part is that no one, not the agricultural scientists advising the irrigation engineers and farmers, the irrigation engineers, the few economists studying the rural economy, the state governments and finally the Planning Commission of the country took note of the changing crop economy and the consequent need to re-examine the pattern of use of canal water in the peninsular region. What was true of the Deccan region was also largely true of the southern peninsula.

The sugarcane and paddy dominated canal irrigation resulted in the limited canal water being used by a relatively small part of the total cultivated area. In Maharashtra nearly 80 per cent of the total canal water is used by the single irrigated crop, sugarcane. To-day less than a fifth of the total cultivated area of the state is irrigated from any source. The engineers estimate that when all flow and lift irrigation sources are fully developed and the water is utilised, the total irrigated area will not be even 40 per cent of the total cultivated area. The situation is not very different in other parts of the dry agricultural region in the country. The

very limited possibility of agricultural development in the remaining sixty per cent of the cultivated land, has led irrigation engineers to design transfer of the excess water of the Ganga and Brahmaputra and their tributaries, supplemented by the surplus from Mahanadi, to the rivers in the southern peninsula, and some areas of Rajasthan and Gujarat for extension of irrigation. No one seems concerned by the fact that it is an extremely expensive and highly uneconomic proposition; for the security of the vast dry land region's agriculture is, for them, of paramount importance.

However, before thinking of this, an effort should have been made to see if the pattern of use of canal water in these dry regions, where water is the scarcest factor of production in agriculture, is being used in the most economic way, in the light of changes in the crops that are and can be grown in the region under irrigation.

It is interesting to note, in this connection, that in recent years the slogan of the irrigation engineers is, more crop per drop. This surely is a very useful agroeconomic slogan. But, when applied to the use of the 'drops' in a multiple crop system, the slogan per force has to be 'more value of crop produced per drop'.

Elementary economic logic shows that a factor of production in shortest supply in the production process of a product should be so used in combination with other factors, that the additional output per unit of the factor in short supply is maximised. Indeed, this is how a farmer would also behave. If a farmer has, say, 15 acres of land in a single patch and has been able to sink a well in his land, he will find out how much water he can get from the well during the year. If he finds that he can get so much of water as can irrigate two acres of sugarcane during the year, will he use the water to irrigate two acres of sugarcane, a crop that will give the highest return per acre? No, he will not do so. He will examine how many acres of other seasonal crops he can irrigate with the help of this quantity of water. Since most other seasonal crops require only one-eighth to one-tenth of the quantity of water required by sugarcane, he will assess the extra value of output from the eight or ten acres of such seasonal crops with the return from an acre of sugarcane to decide the economic use of his well water.

Let us look at the situation in the Deccan Plateau. In this region sugarcane, *adsali* (18 months), requires 175 acre-inches of irrigation water; sugarcane, *suru* (annual), 130 acre-inches of irrigation water. Compared to this, most seasonal crops, like bajra (Hyb-kharif. 20

ac-in.), jowar (Hyb-kh. 15 ac-in.), gram (local-kh. 18 ac-in.) groundnut (HY-kh. 24 ac-in.), cotton (HY-kh. 24 ac-in.), wheat (HYV-rabi. 30 ac-in.), onion (rabi. 36 ac-in.), maize (hot weather. 36 ac-in.), groundnut (hot weather. 36 ac-in.), cotton (long staple-hot weather. 42 ac-in.), require much less irrigation water. Consequently, the areas irrigated by one million cubic feet (mcft) of water in case of these crops are, in area, 4.2 times to 11.4 times the area irrigated by adsali sugarcane.

While area irrigated is important from the point of spread of irrigation and consequently the stability to agriculture, the income generated is also of importance. It is important to note that the net income (net of costs) generated by one mcft of irrigation water was the lowest in case of sugarcane (both *adsali* and *suru*). Irrigating the other crops with that quantity of water yielded 3.8 times the income from adsali sugarcane in case of hybrid kharif jowar, 3 times from hot weather onion, 2.6 times from hyb-kharif bajra, jowar, 3.5 times from rabi onion, 3.2 times from hyv-kharif cotton, 2.6 times from Hyb-kharif bajra, groundnut Hyv-kharif, maize local-kharif and jowar Hyb-rabi, 2.1 times from cotton hy-hot weather, 1.9 times from gram-local. It shows that even the smallest local seasonal crop gave more

than 1.5 times the net income from sugarcane from the given quantity of irrigation water. If we had data for the newer crops like soybean, grapes, etc., they would have shown similar results.

Different suitable crop sequences in kharif, rabi and hot weather on a piece of land under irrigation, estimated with such data, show that at least twice, in fact more, net irrigated area can be irrigated if such seasonal crops are grown in place of sugarcane. It means, a careful economic use of flow water would irrigate more than double the area to-day under irrigation with sugarcane, taking more than three-fourths of the total water. And, estimation of labour employment, both household and hired, was also the smallest under sugarcane.

It is clear that in the dry agricultural region of peninsular India the use of irrigation water in the water guzzling crop like sugarcane (and I am sure, it is the same for paddy) generates the smallest additional total income, irrigates a much smaller, indeed half the economically possible area, benefits a vastly smaller number of farmers and farm labour, and provides little stability to the drought prone agricultural region.

This is a case of glaring uneconomic use, indeed sheer wastage, of this very

important factor of production in agriculture. And, it is a sad commentary on the Indian Planning Commission that it never took note of this misutilisation that has such serious implications for not only the stability but also better economic condition of vast proportions of the rural populace in the dry agricultural regions of India. There cannot be a sadder commentary on its lack of thinking than this.

Instead of looking at the situation from this angle, the irrigation engineers tried to design systems to link the near perennial rivers of the north with those in the peninsula, in order to transfer the 'surplus water' from the Ganga and Brahmaputra and their tributaries to the dry lands of the peninsular region. Forget the environmental problems this might create, the simple economic costs of this scheme was never examined, and when pointed out, were simply ignored. And the Indian Planning Commission did not take a public position about the scheme. Calculations on the basis of the broad data on the scheme of Linking of Rivers showed that the per acre annual capital cost (let alone the cost of maintenance and administration of the system) of irrigating an acre of hybrid jowar, with the help of this river linking scheme, would be 2015 rupees or 4130 rupees (depending on whether the interest on the capital expenditure during the construction period is not or is taken into account);

for an acre of sugarcane it would be 20,150 rupees or 41,300 rupees. It should be clear to anyone with any information about the values of the yield of these crops that this is just an impractical economic proposition. This is a fantastic scheme, cost-wise. If the persons designing such a scheme had considered the economic use of irrigation water from the east flowing rivers of the area, they would have discovered that near about sixty per cent of the net cultivated land of the dry peninsular region could be irrigated, generating more than twice the net income from the water, benefitting many more farmers and bringing significant stability to the region without such fantastic cost of the alternative scheme.

A question can legitimately arise: must we stop growing sugarcane in this region (or paddy, for that matter)? The answer is, No. If water is to be given to the less water using seasonal crops in the command area, of course the farmers cannot grow sugarcane (or paddy) with such limited supplies. But, all the water given in the fields will not be used by the seasonal crop plants. A large part of it will seep down. If the farmers sink wells or shallow tube wells in the command area, they can supplement the limited supply for the seasonal crops with the well water to grow sugarcane (or, in southern peninsula, paddy). Of course, this water may

not be able to sustain the large area that is today under sugarcane in the canal irrigated areas. But, that is not a problem.

To-day there is a surplus of sugar. Huge quantities of paddy are added every year to the buffer stock, some of which spoil over time. On the other hand, India has been importing vast quantities of pulses and oilseeds and vegetable oil. This changed utilisation pattern will lead to greater production of pulses and oilseeds and reduced production of sugarcane and paddy.

Indeed, even in the Punjab, which has over the last few decades seen exclusive land use under paddy and wheat under irrigation, the leading farm economists have proposed a change from paddy to oilseeds and pulses and some other seasonal crops. The ground water situation in the Punjab has become critical due to over-use of it for paddy, aided by free supply of electricity. A change in policy in regard to this, will bring about a more stable crop system as well as careful husbanding of water.

The deltas of the east coast also suffer from such wastages. The ground water situation in the delta region is quite favourable. Even at the height of summer, water in the wells in the delta, used mainly for household cooking and drinking, is within easy reach. But these

deltas - of Mahanadi, Godavari, Krishna and Cauvery- which are completely covered by canals, have never been encouraged, indeed designed, to use ground water to supplement the river water through canals. It is high time this is done. Of course, the wells nearer the coast are likely to yield saline water. That must be avoided. But, subject to this, the conjunctive use of surface and ground water in the delta region will release water for use in other areas that are to-day dry. We need a rational economic use of water in agriculture.

There are other aspects of flow irrigation that have not received the serious attention they deserve. In many flow irrigation projects in peninsular India, the rotational water supply approach to the fields is not adopted. What is followed is the old flooding method. One does not have to argue long that this is a highly wasteful method. There should be water course to the fields such that the farmer, beginning with the one at the end of the water course, can block the flow and divert the water to his field for the duration that will ensure the supply of the given volume of water to his field. This requires two things: an outlet at the head of the water course with a designed discharge of one cusec. Even in systems that have it, it is often noticed that most, indeed all, outlets are not constructed that way, through sheer negligence. This is sure



to prevent proper supply of water to the fields. The second requirement is that no water course shall be designed to serve more than twenty acres. Large command under a water course will mean loss of water in transit which will defeat the goal of proper supply of the intended quantity of water to the field. These are very necessary for the economic use of flow water.

Another problem relates to the timely construction of all designed distributaries and minors, and the timely maintenance of the channels. It is a well known fact that the tail end distributaries of most systems take many years to be completed. This results in the head end farmers getting more water than necessary, leading to uneconomic use of water. And the long delay in completion of the canals results in locally powerful farmers preventing reduction of supply to them, granted temporarily earlier. Channels are also not maintained in time, leading to poor carrying capacity. A proper way to address these issues is to make the farmers in the command area of a distributory or minor, emanating from a main canal, be the owners of the distributor, and in charge of the total water purchased at the head on the main canal. This requires that there should be

water users' associations, formed and registered as societies or companies, with whom the state canal authority can enter into agreement to supply agreed volumes of water in time for the most economic use of such water. The water should be charged on volumetric basis and its use will be decided by the members along each water course. The water distribution inspector shall be an employee of the association, not of the government. In newly designed projects such associations formed of the farmers whose lands are to come under command, will lead to even the tail end canal come up in time to receive the water when the main canal is ready. All these will lead to facilitating the economic use of water in the project, according to which the total command area would be estimated and designed.

These are long term solutions to our problems. But policy has so far been oriented to short term problems. Even when the short term problems are taken care of, the lack of thinking on the long term problems and the current political pressures have resulted in very wasteful use of the scarcest factor, water, at a terrible cost to the economy and society. It is high time this solution is taken into account and adopted. Who will bell the cat?

## THE DECLINING CATTLE POPULATION: WILL THE SACRED COW FINALLY REST IN THE TEMPLE?

Nilakantha Rath

The cattle population in India shows signs of undergoing a sea change in recent times. During the five years, 1956 to 1960, the cattle population of India increased at two per cent a year; in the state of Odisha the annual growth rate was 4.5 per cent, in U.P. 2.7 per cent. The growth rate was as high as that of the human population. In the country there were 50 sacred bovine for every 100 humans. The situation threatened to get out of control.

But, over the next half century there has been a fortunate change. By 1992 there were about 20 crore cattle, only 23 for every 100 humans. And during the twenty years since 1992 the total population of cows and progeny has declined, from 20 crore to about 19 (by 6.69 %).

But, this hides the differential growth of the exotic/cross-bred cattle and the indigenous. The population of the exotic/cross-bred has been growing steadily, from about one and half crore in 1992 to a little less than four crore in 2012, constituting 7 per cent of the total cattle population in 1992 and 21 per cent in 2012. Taking these out of the total cattle population, the population of the indigenous cattle has declined from a

little less than 19 crore to a little over 15 crore (a decline of 20.15%) over the two decades.

This decline has been mainly due to the decline in the population of indigenous male cattle. The total male cattle population declined slightly, from 7.75 crore in 2003 to 7.67 crore in 2007, but significantly to 6.19 crore by 2012. The number of the male indigenous cattle, mainly bullocks, declined by 1.56 crore during these ten years.

The reason is straight and simple. The average size of cultivated land holdings in India has significantly declined over time. To-day more than three-fourth of the cultivated land holdings in the country are of less than two hectares, and more than half of this is of less than one hectare in size. (The average size of holding of the small farmers is 0.67 ha or 1.78 acres). It has become very difficult for most small farmers to maintain even one bullock, not to speak of a pair. They tend to hire the bullocks and ploughs from others for the main ploughing work or, increasingly, hire tractors, small or large, for the purpose. The larger farmers use tractors rather than keep bullocks. The bullocks are sold away, ostensibly to

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\*Source: *Economic and Political Weekly*, Vol. 50, No. 28 (July 11, 2015), pp. 12-14.

traders who sell them to butchers. These Hindu farmers know the destiny of the cattle they sell, but can't help. Keeping them will mean both their cattle's and their own family's starvation in the end.

While the decline in the number of the male indigenous cattle has already started, that of the cows is also on its way. During the five years, 2007 to 2012, the number of the adult cows has not increased (indeed, a very small decline, for the first time). The increased milk supply is being taken care of by the growing number (and proportion) of the exotic/cross-bred cows who now constitute more than a fifth of the total cattle population of India. Gradually the number of the indigenous cattle, both male and female, will decline. Indeed, the total population of cattle will decline, since the exotic and the cross bred, in combination with the growing buffalo population will meet the demand for more milk. And bullocks will become very expensive to maintain, leading to decline in their numbers.

This all-India picture is of course not the picture of every state in the Union. We shall examine the recent changes in four states: Maharashtra, which has recently banned slaughter of all types of cattle; Odisha, which had the highest growth rate of cattle population in the country half a century ago; Gujarat (one

of the five states; the other four states were: Rajasthan 9.94 %, Uttar Pradesh 3.57 %, Chhattisgarh 3.41 % and Assam 2.65 %), which has recorded the highest growth in the total number of cattle, 25.2 %; and Tamil Nadu, that has recorded the highest decline in the cattle population.

Maharashtra had about 1.62 crore heads of cattle in 2007. In five years, by 2012, the total number had declined by seven lakh (to 1.55 crore). But, interestingly, the decline was in the population of the cross-bred male cattle as well as of the indigenous male cattle and in the number of the indigenous cows. Only the exotic/cross-bred cows increased in number, by about 6.3 lakh. The male ones constituted about 17 per cent of the total cross-bred and it declined to 12 per cent by 2012. The point to note is that the sex division in the birth of cattle is like in case of humans, roughly fifty-fifty. The very low proportion of the male population amongst the cross-bred was, therefore, because the male are considered much less useful and are disposed of as early as possible. In Maharashtra the male constituted only about one-eighth of the cross-bred cattle population in 2012. The important thing to note is that the number of the male indigenous cattle also declined, from 76.3 lakh to 67.8 lakh (by about 8.5 lakh). But, what is even more important is that the population of the indigenous cows also declined, from 54.3

lakh to 50.53 lakh. This was compensated by an increase in the number of cross-bred cows by more than six lakh. The more than 12 lakh cattle that were taken out during these five years went mostly to the slaughter house. Now that Maharashtra has banned slaughter of all cattle, where will they go?

The situation in Odisha is quite different. The state has witnessed a drastic change in the growth of the cattle population during the preceding half century. From an annual growth rate of 4.5 per cent during 1956-60, it recorded a negative growth rate during 2007-12: a decline of 5.6 per cent in five years or an annual decline of one per cent. This is a welcome development. But, that appears to be all! The cross-bred cattle were about 14 per cent of the total cattle population in 2007; it had declined to 11 per cent by 2012. Fortunately, the decline was mainly due to the decline in the number of male cross-bred: from 8.8 lakh to 3.2 lakh and an increase in the number of the female ones. There was no perceptible change in the number of the indigenous male cattle! Interestingly, there was a decline in the number of the indigenous female cattle, from 50.3 lakh to 48.1 lakh. There was also a decline in the number of the cows in milk at the time of the survey in 2012. This appears to have been compensated by the increase in the number of the cross-bred cows in milk.

That is all. Back in 1960 Odisha Legislative Assembly passed a law, called the Prevention of Cow Slaughter Act, 1960, (Act 5 of 1961) which bans slaughter of all cattle, except those that are certified by a responsible officer to be in physical handicap or disease and/or is more than 18 years of age and therefore fit to be slaughtered. This possibly is the reason why even the male crossbred were not slaughtered till 2007. In recent years there has been an extensive export of cattle (illegally) from Odisha, Bihar and west Bengal (as well as some other north and even west Indian states) to Bangladesh. Bangladesh imports nearly two-thirds of the cattle annually slaughtered in that country. Its main export is leather, hides and skin as well as leather goods. There is also some restriction on the manner of transport of cattle in Odisha. Odisha's cattle economy at present, therefore, appears to be an example of what a more progressive cattle economy in another state can become if the farmers are prevented by law from disposing of their unproductive cattle.

The situation in Gujarat was quite different from that of many other states. Of the five states recording increase in the total cattle population in the five years, from 2007 to 2012, Gujarat recorded the highest increase, 25.2 per cent. The increase was entirely due to the increase in the population of the female

cattle of both types. In 2007 the cross-bred constituted over 14 per cent of the total cattle population. And, unlike in Odisha, the males were less than 19 per cent of the cross-bred's total population. This shows that in Gujarat the farmers were disposing of their male cross-bred. This was true of the indigenous male cattle, but in smaller proportion. The male constituted 48.5 per cent of the total. By 2012 the number of the males, both cross-bred and indigenous, had declined significantly, by 8.8 per cent. The very significant increase was in the population of both types of female cattle: their total population increased from about 77 lakh to about 99 lakh. And, while the cross-bred increased from 9.3 lakh to 17.3 lakh, the indigenous increased from 35 lakh to 50 lakh. This was quite different from the situation in many other states. This is a major milk producing state and has traditionally a breed (Gir) that is better milk yielding. But the important point to note is that while the female cow population greatly increased, that of the male drastically declined. If this had not been permitted, what would have happened?

The fourth state, Tamil Nadu, shows a pattern of change that all other states are likely to show, if not hindered by ban laws. The introduction of exotic and cross-bred cattle started in this state much earlier than elsewhere. By 2007 the exotic and cross-bred cattle constituted nearly

two-thirds (66%) of the total cattle population of the state. By 2012 their share went up to 72 per cent. What was more important was that the population of all categories of cattle recorded decline: the cross-bred, both male and female, declined from 1.12 crore to 88 lakh (by 21.2%). The decline was much larger in the population of the indigenous, by 35.4%. The cross-bred declined by only 14 per cent. And, of course, the biggest declines were in the numbers of the male cattle: the total male cattle declined by 41 per cent, while the female by only 14.8 per cent. Even in this the bigger decline was in the population of the indigenous cows, 30% in these five years. If unhindered by laws banning slaughter of cattle, the indigenous cattle population will most probably be reduced to insignificant numbers in another two decades.

The Odisha situation characterises the pattern in a very small holding farm economy, with poor irrigation and multi-cropping, heavy dependence of people on agriculture and low urbanisation, where the cattle economy is largely incidental to subsistence agriculture, and severely handicapped by a law banning slaughter of all types of cattle. But for the illegal export of cattle to Bangladesh, the situation would have been worse. (Recently, the effort of the Indian forces in the India-Bangladesh border to prevent smuggling of cattle from India has led to

decline in such exports and high price of cattle in Bangladesh and reduced exports of its products.) And, against this is the trend in Tamil Nadu, a fast urbanising state with developed and intensive irrigation and fast declining dependence on farming for employment. The superior milk yielding exotic and cross-bred cows will gradually become the major milch animals.

Gujarat shows the chances of a better milk yielding local breed; but, even then the proportion of the cross-bred is growing and will continue to grow, though the decline in the importance of the indigenous cow might take more time. If slaughter of the male is prohibited, it is very difficult to imagine the rapid growth in the number and milk production of both types of cows.

Maharashtra shows the the picture of the nation's average state. If unhindered, it will steadily move in the direction of Tamil Nadu. But, if the slaughter of all cattle and trade in beef is banned, as it has now been, it will soon revert to the Odisha situation and worse. What will the farmers do if they cannot sell their cattle, both male and female? Is it possible that the state government will run feeding centres for the vast and growing numbers of useless cattle and cattle that cannot be maintained by the farmers, when the government has found it difficult to feed

the much smaller numbers during a few months of a period of drought? The abandoned cattle in the countryside, as well as in towns will become a terrible nuisance to agriculture as well as for the safety and security of people.

The indigenous milch cattle has little chance of survival and growth. Long ago the Brazilian government imported Gir cows and bulls from Gujarat and Ongol cattle from Andhra Pradesh. Over years, through systematic selective breeding, they have developed an extremely high milk yielding Gir species and a very high quality beef cattle of the Ongol variety, which they are also exporting. Until now nothing had been done to improve the stock of our indigenous cattle in India. Only belatedly now attempt with a few breeds has started. But the ban on slaughter of cattle threatens to sound the death knell of any such endeavour. Both the indigenous and the cross-bred cattle will ultimately perish.

The reason behind the demand for a ban on slaughter of the cow and its progeny is well known. The problem faced by the 'sacred cattle' in India has been a matter of concern for a significant section of its Hindu population. This was the reason why in the Constituent Assembly a powerful group of MPs, including of course many Congressmen, insisted on a ban on slaughtering of Cows

being put in the Constitution. The resistance to this was equally powerful. A final settlement was to include a provision to the effect in the Directive Principles, which are only indicative and not obligatory, unlike the Fundamental Rights.

Sometime after independence, using this provision, a section of political leadership as well as Hindu religious advocates began pressing for promulgation of a law to this effect. The then Shankaracharya of the Govardhan Math in Puri went on a fast (only during the day time?) in November 1966 to press the demand. To-day, after half a century, with a government by a political party wedded to Hindutwa in the centre and in some of the states, there is a renewal of this demand. The extension of the law to ban slaughter of cows to all its progeny and the ban on trade in and stocking of beef by the new state government of Maharashtra is due to that.

The reason behind this latest demand is the same as before: the cow is sacred to the Hindus, who worship it as Mother and who use its excreta, like urine and stool (gobar), besides of course milk, in all their religious ceremonies. They believe that the Cow's body contains the thirty three crore godheads mentioned in Hindu puranas. Vinayak Damodar Savarkar describes how these thirty three

crore godheads are crammed in the body of the cow: "All, all Gods, including Vishnu, Brahma, Shankha, Chandra, Surya, Soma, Yama, et cetera, are crowded into her body. Some in the eye, some in the teeth, whosoever could manage wheresoever. On its backbone the Gods are so severely crowded, like the mischievous kids on a bench during the half hour recess between teaching sessions, that if even a cow worshipper, finding her eating the wheat laid out for drying, hits her with a wooden stick, it is most likely that at least half a dozen godheads will try to escape from the back! Finding such extreme crowding, Kul Parvat (Hill) tried to enter through her hoof. Nag (the Snake god) in the tail, Maharshis in the holes in the hair! But, the most pathetic condition was that of poor Maruta and Varuna! Like Bones for the late comers, these two had to remain satisfied with the places that were available. The two places were the (intestinal) Wind for Maruta and the Vagina for Varuna! And, Ganga, in Urine!" (Translated from his essay, "Cow - a useful animal, not mother, and certainly not a God" in *Savarkaranche Samajik Vichar*, compiled by Vidyadhar Pundalik, Majestic Prakashan, 1973)

The sacred cow runs the risk of ultimately becoming a scarce animal in the village, maintained by the temple for its excreta and for worship, possibly a

Golden Cow, like by the Jews of ancient times!. In the absence of efforts to significantly improve the indigenous breeds this is sure to happen. With ban, this process is likely to be expedited. Even God cannot save the sacred cow!

[Note: The data on cattle population cited in this article are taken from the 18th and 19th All India Livestock Census, 2007 &

2012. The data on small farmer holdings are taken from the latest report on Agricultural Census. The information on smuggling of cattle to Bangladesh is based on information published in The Hindu, 4th June, 2015. I record my thanks to Chanda Nimbkar, Sharadini Rath, Tapan Mishra and Satyajit Rath for helpful suggestions.]



## AGRICULTURAL GROWTH AND INVESTMENT IN INDIA

Nilakantha Rath\*

*The annual rate of growth of the net domestic product as well as the total production from agriculture in India reached a peak during the fifth five year plan period, and has shown a declining trend during the Eighties. This appears to be largely due to reduction in the growth of real fixed capital formation in agriculture. There has been a declining trend in the share of public investment in agriculture during the Sixth and the Seventh Plans. This is sought to be made good by increased private investment in agriculture. But private investment in agriculture, increasingly financed from bank loans, has been geographically very unevenly distributed. It appears unlikely that without greater public sector investment and other appropriate policy measures, the vast regions characterised by poor agricultural growth can come up and use institutional credit to a greater extent.*

After three and half decades of planned economic development, India continues to be a predominantly rural and agricultural society. More than three-fourths of the population live in rural areas. While this proportion has steadily declined over the past 30 years, the percentage of population dependent on agriculture for its living remained unchanged at around 70 per cent for 50 years till 1971; it has registered a marginal decline only during the last one and a half decades. It means, the rate of growth of the population dependent on agriculture has been the same as, and after 1971 only marginally lower than, the rate of growth of the total population in the country. The rapid decline of rural handicrafts and of the

artisan class has added to the increase in the number of people dependent on agriculture and kept its proportion unchanged.

This sustained rate of growth of population dependent on agriculture for its living has been matched -but just matched -by the rate of growth of total net income generated in the agriculture sector, i.e. the net domestic product (NDP) in agriculture. The annual compound rate of growth of the total net income (NDP) generated in the agricultural sector during the 30 years, 1955-56 to 1984-85, (at constant prices) has been 2.14 per cent, just about the rate of growth of population dependent on

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agriculture. (The First Five Year Plan period has been excluded since the data are not free from serious omissions despite efforts of the statistical agencies.) As a result, the average real per capita income of the people living on agriculture has remained practically stagnant during the last 30 years or more. This should be a matter of great concern.

One would have expected the introduction of the new varieties of cereal seeds, propagated in Indian agriculture soon after the middle of the sixties, combined with extension of irrigation and use of fertilizers and insecticides, to result in a higher rate of growth of income in the agricultural sector than before. But this does not appear to have happened. The annual compound rate of growth of income (NDP) in agriculture during the 10 years, 1955-65, was 2.23 per cent a year. This was followed by two years of severe drought; but just after this the new wheat, rice and millet seeds were introduced. The compound rate of growth of income in the agricultural sector during the period 1968-69 to 1984-85, however, has been 2.26 per cent, not very different from the growth rate in the pre-Green Revolution decade.

There is also no evidence of a steady increase in the rate of growth of agricultural income in the successive Plan periods. During the Fourth Five Year

Plan period (1968-69 to 1973-74), the growth rate of NDP was 2.07 per cent; in the Fifth Plan period (1973-74 to 1978-79) it was 3.95 per cent; and in the Sixth Plan period, i.e., 1978-79 to 1984-85 (excluding 1979-80, a year of severe drought), it was 1.66 per cent only. (If the income in 1979-1980 were at the same peak level as in the previous year, the growth rate of agricultural income in the Sixth Plan period would not be greater than 2 per cent a year.)

These growth rates are calculated by taking the agricultural income generated in every year - good, bad or indifferent - of the period. A way of measuring the growth in the achieved potential levels of income generation is to calculate the growth rates of peak incomes over the period. In the decade 1955-1965 it was 2.66 per cent per year. During the Fourth Plan period it was 2.9 per cent (this is rather high because the base year, 1968-69, income was lower than the income in 1964-65); during the Fifth Plan it was 3.72 per cent; but during the Sixth Plan, i.e., 1978-79 to 1984-85, it was 1.35 per cent only.

Thus, it appears that the growth rate of income in the agricultural sector was significantly high only in the Fifth Plan period; during the Fourth Plan period it was comparable to the rate of growth in

the pre-Green Revolution decade, and in the Sixth Plan period (including 1979-80) it was distinctly lower.

What is true of the trend in net agricultural income in India, is also true of the trend in gross agricultural production.<sup>1</sup> The annual compound growth rate of agricultural production in the decade preceding the Green Revolution, i.e., 1955-1965, was 2.95 per cent. During the Fourth Plan period it was around 2 per cent (1967-68 to 1973-74 it was 1.97 per cent; excluding the years of poorer production, i.e., 1968-1969, 1971-72 and 1972-73, it was 2.18 per cent); during the Fifth Plan period it was 4.45 per cent; and during the period 1978-79 to 1985-86 (i.e., the Sixth Plan and first year of the Seventh Plan), excluding 1979-80, it was 2.36 per cent only. Over the entire period 1967-68 to 1985-86 the annual compound growth rate of gross agricultural production was 2.66 per cent only, which is less than during the pre-Green Revolution period.

If we compare the trend rates of growth of peak levels of production we also find similar differences. During 1955-65 this growth rate was 2.78 per cent a year; during 1967-86 it was 2.69 per cent. During the Fourth, Fifth and Sixth Plan periods it was 2.18, 4.00 and 2.13 per cent, respectively.

Indeed agricultural production and income appear to have registered the highest rates of growth during the Fifth Five Year Plan period; thereafter there has been a distinct slowing down. Against the background of the dependence of more than two-thirds of the population on agriculture and the stagnancy of their average per capita income level, this slowing down in the growth of agricultural production and income deserves careful attention.

Growth of agricultural production depends upon a number of factors, the most important of which are technological improvement in crops and production methods, investment in agriculture, the institutional structure in land holding, as well as the trend in relative prices and terms of trade. Rainfall and other weather conditions are also particularly important in explaining trends over relatively shorter periods, like a Plan period. We begin by examining the trend in investment in agriculture, in order to see to what extent the trend of growth in agricultural production and income can be related to it. While attention will not be paid to the other factors, it is useful to note that the impact of technological changes in agriculture, like new seeds and crops as well as application of fertilizers, is dependent on acts of investment like irrigation and land development.

Let us first review the Plan targets and performance in regard to outlay and investment during the last three Plans. The percentage of total Plan Outlay on agriculture (including irrigation, forestry and fisheries) in the Public Sector has been better than 20 per cent in most Plans: it was 24, 20.6 and 25.3 per cent in the Fourth, Fifth and Sixth Five Year Plans, respectively. In actuality, these percentages were more or less achieved in the three Plans: these were 23.3, 22.2 and 23.9, respectively recording a marginal shortfall in the Fourth and the Sixth Plans and a marginal rise in the Fifth Plan period.<sup>2</sup> It suggests that there was no great diversion of actual public sector Plan Outlays from agriculture to other sectors.

But these are only percentages of actual total plan Outlay in the Public Sector during a Plan period. It would be more relevant to ascertain if the projected total Plan Outlays or investments in agriculture were actually achieved. Unfortunately direct comparable data are not available for the purpose. But indirect method of estimation,<sup>3</sup> shows that the actual investment in agriculture and allied matters in the public Sector was about 10 per cent less than planned during the Fourth plan period, somewhat higher than planned during the Fifth Plan, and nearly 23 per cent less than planned during the Sixth Plan.

What about the investment in agriculture in the private sector? The Fourth plan visualised private sector investment in agriculture to be about a third of the total investment in agriculture.<sup>4</sup> In fact, private sector investment in agriculture turned out (at comparable prices) to be 2.7 times that planned. This is what made the actual total investment - public plus private - in agriculture during the Fourth Plan much larger in both absolute terms and in terms of share of total gross capital formation in the economy, than what had been planned. The Fifth Plan did not present estimates of private sector investment. But the National Accounts Statistics of the Central Statistical Organisation (CSO) show that both total as well as private sector investment in agriculture increased at about the same rate during the Fifth Plan over the Fourth. In the Sixth Plan, as noted above, there was 23 per cent shortfall in public sector investment in agriculture; but simultaneously there was an almost 19 per cent higher investment in agriculture in the private sector than planned, leaving the total investment in agriculture only about 2.5 per cent less than planned.

This review of investments in agriculture during the last three Plans shows that the total actual investment in agriculture in the public and private sectors together was higher than planned during the Fourth Plan period, and

thereafter has been approximately equal to Plan targets. But the actual public Sector investment was lower by 23 per cent than planned during the Sixth Plan period. The investment by private sector in agriculture, on the other hand, registered a sharp increase over that planned in the Fourth Plan and has continued at the high level. Indeed, its share in total investment in agriculture increased in the Sixth Plan, when private sector investment made good the very considerable shortfall in the investment in the public sector.

The long term constancy in the rate growth of real income generated in the agricultural sector as well as of gross agricultural production, indeed the slight decline in it during the Sixth Plan period, cannot, therefore, be attributed to any serious divergence of the total investment in agriculture from the planned levels in the three successive plans. Could it then be that the planned level of total investment in agriculture was inadequate to sustain a higher rate growth of production and income in the sector? In order to examine this question we propose to use the data on Gross Public and Private Sectors in the put out by the It is useful to remember here that while the CSO data on public sector investment in agriculture relate only to direct investments in agriculture (and related items including irrigation), the Plan document includes

many other items (like agricultural education and research, land reforms, warehousing and storage, co-operation, investment in rural financial institutions, management of natural disasters, community development and panchayati raj institutions, parts of investments in IRDP and special area programmes, etc.), investments under which are classified under other heads in the National Accounts Statistics.

Long term time series show that Gross Domestic Capital Formation in agriculture as a share or percentage of Gross Domestic Product (GDP) in Agriculture in India, both valued at current prices, has steadily risen since the middle of the sixties. Gross formation which formed less than 6.0 per cent of the GDP in agriculture till the middle of the sixties, rose steadily thereafter and was about 14 per cent of GDP during the Sixth Plan period.<sup>5</sup> One would have thought that with investment in agriculture forming a growingly larger proportion the income generated in agriculture, this income should grow at a faster rate. But that does not appear to have happened. There can be several reasons for this.

First of all, it may be repeated that in the above calculation the GDP and gross capital formation have been valued at current prices. If the relative prices of farm products and capital goods as well

as current inputs have changed very much, then a higher value of investment will become necessary to sustain a given rate of growth of income. There is some evidence to suggest that during the Sixth Plan period the terms of trade of agriculture were somewhat lower than what they were earlier [Rath, 1985(a)]. But from the point of view of capital formation, it is important to note the very sharp increase in the relative price of capital assets in agriculture. The CSO data show that while the implicit index of prices at which the income (GDP) in agriculture is computed, had risen by 76 per cent between 1973-74 and 1984-85, the implicit price index of Gross Capital Formation in agriculture had risen by 169 per cent during the same period. The bulk of the rise in the latter price index was between 1973-74 and 1980-81, when it rose by 89 per cent, while the GDP's price index rose by only 34 per cent. However, during the Sixth Plan period there was a spectacular rise in the implicit price index of Gross Capital Formation in agriculture in the Public Sector. Its price index rose by 78 per cent over five years (during 1980-81 and 1984-85), while those of private capital formation as well as of GDP in agriculture rose by around 32 per cent only.

This sharp increase in the cost of investment in agriculture since 1973-74 implies that in order to create additional

assets of a given quantity a relatively much larger sum was needed compared to the value of the output it could produce, than was the case earlier. This has become more so in case of Public Sector investment in the Sixth Plan period.<sup>6</sup>

If we adjust for these price changes and compare Gross Domestic Capital Formation (GDCF) in agriculture with the Gross Domestic Product (GDP) in agriculture at constant (1970-71) prices, we find that real Gross Capital Formation as a percentage of real GDP rose from around 6 per cent in the early sixties to 7.5 per cent in the latter half of the sixties, to about 11.5 per cent during 1978-81, then declining to around 10.5 per cent in the last four years of the Sixth Plan period. Thus, it appears that the rising share of gross capital formation to GDP at current prices was partly due to rising costs. Nevertheless, there appears to have been an increase in the proportion of real gross capital formation in agriculture to the GDP from agriculture, during the last two decades.

But the second fact that deserves attention in this context is the role of changes in stock or inventories in the gross capital formation in agriculture. Gross capital formation consists of fixed capital formation plus changes in inventories. While inventories are a necessary part of any enterprise, changes in it from

year to year are generally of a fluctuating character. The calculation of inventories in the private sector in agriculture (which accounts for the bulk of it) is done by a very unsatisfactory indirect method, which the Committee on Capital Formation and Savings in India (1982), (the Raj Committee) has recommended to be changed. [Reserve Bank of India, 1982 p. 90] In any case, the crucial investment from the point of view of growth in production and income is investment in fixed capital formation. It would be useful, therefore, to examine how fixed capital formation in agriculture has behaved during the last three Plan periods.

Changes in inventories formed less than two per cent of the Gross Capital Formation in agriculture till the beginning of the Fourth Five Year Plan. Thereafter, it increased greatly and during the last 7-8 years (i.e., since 1978-79) came to form 16 to 22 per cent of the real gross capital formation in agriculture. Netting this from Gross Capital Formation, one gets Gross Fixed Capital Formation in agriculture at constant (1970-71) prices. These data show that real fixed capital formation in agriculture as a percentage of real income (GDP) in Agriculture increased from around 6 per cent at the end of the Third Plan period to 7.5 per cent in the later part of the sixties, reaching 8.5 per cent by the

end of the Fourth Plan. Thereafter, it increased to 9 - 9.8 per cent during 1976-77 to 1980-81, declining again to 8.5 per cent during the Sixth Plan period.<sup>7</sup> This shows that there was no significant increase in the share of fixed capital formation in the total income from agriculture in the Sixth Plan period over the Fourth Plan period; only the five years, 1976-81, recorded a distinctly higher level.

But the matter does not end here. In order to assess the impact of investment in agriculture on the growth rate of income, we need find out if the entire investment was adding to the productive assets in agriculture, by taking account of replacements. The point can be illustrated with an example.

One of the items of fixed capital formation in agriculture is tractors and related farm machinery. The All India Livestock Census of 1976 shows that there were 2.76 lakh tractors with farmers in India in 1977 [Ministry of Agriculture and Rural Development, 1985, Pp. 178-179]. The Seventh Five Year Plan document states that there were 5 lakh tractors in use in India in 1984-85 [Planning Commission, 1985, p. 2]. This means there was a net addition of 2.24 lakh tractors during the nine years since 1977. But the number of tractors produced in India and sold in the domestic

market during these years was around 5 lakh [Ministry of Agriculture and Cooperation, 1986, p. 74]. It means, 2.76 lakh tractors were phased out during this period. Therefore, more than 50 per cent of the investment in tractors during this period can be said to have been for replacement, not addition to fixed capital formation. About one-fifth of the total term loans to agriculture in India is for the purchase of tractors.<sup>8</sup> With the help of this one can estimate the extent of total gross fixed investment on replacement of tractors. Somewhat similar is investment in pumpsets. Rural electrification has resulted in a large measure in replacement of diesel pumpsets by electric ones. Most of these diesel sets remain as standby units with the farmers, without making any significant contribution to further growth of agricultural production. The data on these are not readily available. But it is likely that adjustment for this to a similar extent as for tractors would put the share of effective fixed capital formation at less than 8 per cent of the GDP in the agricultural sector during the Sixth Plan period. This is lower than the levels in the Fifth Plan period.

A few other factors may also be taken into account in this context. One is the under-use or non-use of capital assets created. Creation of an asset can lead to greater output provided it is used. While

there has been no change in the percentage use of potential created under major and medium irrigation projects completed, a new phenomenon reported during the Sixth Plan period is the under-use of minor irrigation projects completed, to the extent of about 6 or 7 per cent of the total potential [Ministry of Finance, 1987, p. 15].

The nature of investment is another matter that may lead to poorer income generation with the help of assets. A glaring instance appears to be the investment under IRDP. The total investment due to IRDP accounts for about 15 per cent of the total fixed capital formation in agriculture during the Sixth Plan. The concurrent monitoring surveys by the Department of Rural Development, in the Ministry of Agriculture and Cooperation, lead one to believe that the capital-output ratio of this investment is very high, possibly around 6 or 7, if estimated at constant prices. This is a new type of investment during the Sixth Plan, with a relatively short gestation period. Therefore, its impact on the growth rate of income from agriculture (including dairy and animal husbandry) could not have been in the direction of raising it. The net result of all this is that effective fixed capital formation in agriculture has not been a growing proportion of the total B income generated in agriculture during the last three Plans. There was a distinct



improvement in this in the last three years of the Fifth Plan, but the actual achievement in the Sixth Plan has been significantly lower than that. There was a distinct decline year by year, in real capital formation in the Public Sector during this Plan, and the bulk of the decline was in the field of irrigation which had a distinctly lower share in actual total public sector outlay than had been planned [Ministry of Finance, 1987, p. 15]. While decline in Public Sector investment was made good by increased investment on private account, the instances relating to tractors, pumpsets, minor irrigation and IRDP suggest that a growing proportion of this was either for replacement of assets or wasted in idle capacity or on investment along lines with very low income generating capacity. The net effect is a lowering of effective investment in agriculture.

The matter may be looked at in a different way. The total fixed capital formation in agriculture in the economy (at constant prices) was nearly 31 per cent higher during the Fourth Plan over the investment in the previous five years.<sup>9</sup> But the total fixed capital formation during the Fifth Plan was only about 16 per cent greater than during the Fourth Plan, mainly because of the sharp decline in investment in the private sector due to inflation and stringent credit restrictions to fight it during the first two years,

1974-76. In the remaining three years the annual level of investment in agriculture was much higher than during the Fourth Plan. The fixed capital formation in the Sixth Plan was 23 per cent higher than during the Fifth Plan. But if we could make allowance for replacements and IRDP - a brand new low productive investment - the rest would most likely not record a better than 18 per cent increase over the Fifth Plan. Indeed, the annual average fixed investments net of replacements during the Sixth Plan would, in all probability, turn out to be lower than during 1976-80. For an economy planning for a higher rate of growth based on a higher level of agricultural production and income, it does not auger well.

We can compare these incremental rates of capital formation with incremental rates of growth in income. The annual GDP in agriculture (at constant prices) had increased by about 14 per cent over the pre-Fourth Plan peak by the end of the Fourth Plan. During the Fifth Plan this increase was more than 20 per cent. But during the Sixth Plan the increase in peak GDP was less than 11 per cent (1983-84 over 1978-79). Normally, one would expect many fixed investments in agriculture to register their full potential impact with a lag of a few years. In a rough way one can say that the high rate of growth of GDP in agriculture in the

Fifth Plan was due to the high rate of fixed capital investment in the Fourth Plan. Of course, the weather was another contributing factor: the last four years of the Fifth Plan period recorded reasonably good rainfall leading to increased farm production. The poor growth rate of income in the Sixth Plan period may not be entirely due to lower rate of growth of capital in agriculture. The plan period was plagued (and the Seventh Plan period continues to be) with indifferent or poor weather, except in 1983-84 when agricultural production recorded an unprecedented peak. Yet this peak level of income compared with 1978-79 (an earlier peak also) records an increase in GDP-Agriculture of less than 11 per cent.

This long review of trends of investment and income in agriculture shows that during the last 15 years there has been no significant increase in the rate of fixed capital formation, and the Sixth Plan records an effective decline. The steady decline in public investment in agriculture has been in hard investments like irrigation; the compensating increase in private investment has been in IRDP. The advocacy of a direct attack on rural poverty was in the nature of a programme to supplement the best possible planned investment for agricultural development [Dandekar and Rath 1971]. It was observed that the normal plan programmes for agricultural development,

constrained by the requirement for material balance in the economy, were unlikely to raise the income of the large body of rural poor above the poverty level in a reasonable span of time. Therefore, a supplementary programme, with little material input other than unskilled labour, to be financed through transfer of earnings from the upper income classes, was advocated. Unfortunately, however, this direct attack on rural poverty whether through NREP, EGS and RLEGP or DRDP, appears to have substituted planned investment in agriculture, instead of being a supplement to the best possible efforts in agricultural investment. It is possible that the large buffer stock of foodgrains created a feeling of complacency; it appears to have given rise to a feeling that agriculture is no longer a pressing priority in development effort. If true, it is dangerous.

But, it appears, that is what was proposed in the Seventh Five Year Plan. The Plan provides for 19 per cent of the total Plan expenditure on Agriculture and allied matters, while in the Sixth Plan it was 21.1 per cent. But unlike in the Sixth Plan, the investment in the Public Sector in Agriculture is put at 17.9 per cent of total Public Sector Investment, while in the Sixth Plan it was 20.7 per cent. There is a similar lowering in the share of private sector investment in agriculture, from 21.55 per cent to 20.2 per cent.

But the more meaningful way of comparing the Seventh Plan allocations is with the achievements during the Sixth Plan. The proposed total investment, public plus private, in agriculture in the Seventh Plan (including both direct and indirect investments, as the Plan documents give it) is only 9.5 per cent higher than the total actual investment in agriculture during the Sixth Plan period (both at 1984-85 prices). This, against an almost 33 per cent increase in the proposed total Seventh Plan investment over the actual Gross Capital Formation in the economy during the Sixth Plan. But what is more, the proposed Public Sector investment in agriculture is marginally lower than what was achieved during the Sixth Plan (which itself was 23 per cent lower than what had been proposed), while the proposed private sector investment in the Seventh Plan is almost 25 per cent higher than what was achieved during the Sixth Plan (which was also almost 18 per cent higher than what had been proposed). Thus, there is a distinct shift in proposed investment away from Public Sector and in favour of the Private Sector. Since the direct investment in agriculture in the Public Sector, as measured by the CSO's Gross Domestic Capital Formation in Agriculture in the Public Sector, formed about 50 per cent of the total achieved Plan Investment in Agriculture (both direct and indirect), we can fairly suggest that the same is proposed in the Seventh Plan. This estimated Gross Capital Formation in Agriculture in the Public Sector plus the proposed private sector investments in agriculture in the Seventh Plan turns out to be only about 16 per cent higher than the actual investment during the Sixth Plan. We may recollect that the actual percentage increases in Gross Capital Formation in Agriculture in the Fourth, Fifth and Sixth Plan periods were 31, 16 and 23 per cent, respectively higher than during their preceding five year periods. It appears from this that the rise in capital formation in agriculture is going to be of the order of what it was during the Fifth Plan - the lowest during last three Plans. Apart from the fact that the Fifth Plan was plagued by severe inflation and drastic credit control measures during the first two years, while the Seventh Plan is a proposal, there is a basic difference in the pattern of public and private investment then and now. Unlike in the Fifth Plan, Private (and even Public) investment in the Seventh Plan has a large component of IRDP investment, as was in the Sixth Plan. There is no indication if the under-utilization of minor irrigation potential created -noticed for the first time in the Sixth Plan - would vanish now. The replacement factor would become increasingly important in the gross capital formation. Thus, with the same set of problems in the Seventh Plan as in the Sixth Plan, the

percentage rise in Gross Capital formation has been proposed at 16 per cent during the Seventh Plan, while this rise was 23 per cent in the Sixth Plan. The effective fixed capital formation is sure to be lower in such a situation.

One wonders if even these proposed investments would materialise, particularly in the public sector, in view of the short fall in Plan resources due to mounting non-Plan expenditure, to which the Planning Commission has already drawn attention. As for private investment, the very low productive investments like IRDP dominate the field. But what is even more important, the private investments, particularly from loan funds, are regionally very unevenly distributed. Let us turn our attention to this.

An important source of gross capital formation in the private sector in agriculture is loans from financial institutions, cooperative and commercial banks. (The Government's direct loans to agriculturists are a very minor part of the total loans.) The term loans made to cultivators by these financial institutions are essentially for creation of durable capital assets. Therefore, it is proper to compare actual term loan advances to agriculture in a year to the Gross Fixed Capital formation in agriculture in the private sector in that year. Data show that

at the beginning of the seventies institutional loans accounted for about 25 per cent of the gross fixed capital in agriculture in the private sector.<sup>10</sup> But soon, with the nationalised commercial banks entering the field in a big way, the share of institutional finance increased to more than 30 per cent in the remainder of the seventies and to more than 45 per cent in the Sixth Plan period, reaching 54 per cent by 1984-85. Loan finance has thus become progressively important in fixed capital formation in the private sector in agriculture, which in turn has become steadily more important in the total fixed capital formation in agriculture over the years.

The growingly important term loans for private fixed capital formation in agriculture have been very unequally distributed amongst regions in the country.<sup>11</sup> In 1973-74, the last year of the Fourth Plan, six States, Punjab, Haryana, Gujarat, Maharashtra, Tamil Nadu and Kerala, which traditionally had been in the forefront of the cooperative credit movement in the country, received 50 per cent of total term loans disbursed during the year, while they accounted for only 30 per cent of the total agricultural land in the country. As against this, six States, namely, the four States of eastern India - Assam, West Bengal, Bihar and Orissa - and the two States of Madhya Pradesh

and Rajasthan in Central India, accounting for 40 per cent of the total agricultural land in the country, received only 21 per cent of all term loans disbursed. The rapid growth of term loans in the subsequent decade has seen realignment in the dominant position of some States: while Punjab and Haryana have continued to dominate, increasing their share by nearly 50 per cent over the years, Maharashtra and Gujarat have lost their dominant position (thanks to the relative decline in the performance of the cooperatives), and Andhra Pradesh emerged as another State with a larger share than its cropped area. In 1976-77, Punjab, Haryana, Andhra Pradesh, Karnataka and Kerala, with only about 22 per cent of the total cropped land received 44 per cent of the total term loan. In 1983-84, Punjab, Haryana, Andhra Pradesh and Kerala, with only 16 per cent of the total cropped land received 32 per cent of the total term loan, in 1984-85 Tamil Nadu substituted Andhra Pradesh amongst the top four, which received more than 28 per cent of the loans with only 11 per cent of the cropped land. Thus, Punjab and Haryana and the four southern States have by and large received the bulk of the term loan - twice as large a share as their share in total agricultural land.

As against this, the share of the four eastern Indian States and Madhya Pradesh and Rajasthan remained unchanged

at around 22 per cent over the entire period, and the share of the four eastern Indian States in the total term loans has remained below 10 per cent without any improvement. However, if one takes only direct term loans for land-based activities in agriculture (excluding allied activities), the share of the four eastern Indian States had come down to only 4 per cent in 1984-85. (These data are not presented here). This skewed distribution of term loans for capital formation in agriculture is sure to be reflected in the performance of agriculture. The average annual growth rate of cereal production in the four eastern Indian States and Madhya Pradesh, during the period 1967-68 to 1984-85, was between 0.5 and 1.5 per cent, which was less than half or quarter of that for the country as a whole.

Indeed, in many other states where the share of term loan has been comparable to their share in total agricultural land, one can still find a low rate of growth in agriculture because of very skewed distribution within the State. The irrigated pockets - the pockets of faster agricultural development within a State - are likely to absorb larger share of the term loans for agriculture. (Even IRDP loans show this characteristic.) Tamil Nadu shows a much better growth rate of sugarcane than the all-India average, while for most other crops its performance has been poor. Rajasthan shows a very high rate of

growth of rice, wheat and sugarcane - three major irrigated crops - while in case of other, mainly unirrigated crops, the growth rate has been negligible if not negative. It can be safely conjectured that most of the term loans must have gone to the canal irrigated areas in the state. In Punjab nearly 90 per cent of the total cropped land is irrigated and Punjab's share in total term loans is not only three times as high as its share in total cropped land, but nearly half of its term loans is for purchase of tractors and other farm implements. Indeed, NABARD has to check Punjab's propensity to demand larger term loans for the purpose, in order to ensure that other regions are not starved of the earmarked funds for refinancing.

The greater the level of agricultural development, the greater the capacity and desire of farmers to take term loans to finance capital formation in agriculture. The poor credit-deposit ratios of banks in any agriculturally underdeveloped region indicate only the other side of this coin.

The implication of this is that one cannot depend increasingly upon institutional credit and, through it, on private sector investment in agriculture to bring about greater investment, production and income in the vast regions of the country presently agriculturally underdeveloped.

Let us remind ourselves of the Commission's statement that only 15 per cent of the cropped land in the country has accounted for more than 50 per cent of the increased cereal production in India in the post-green revolution Period. The under-developed areas are mainly the eastern Indian States and the relatively low rainfall regions spreading from north to south in the western part of the country.

The low rainfall (or the so-called dry) regions in central and peninsular India are characterised by low flow irrigation potential as well as greater uncertainty of sub-soil water for irrigation [Rath and Mitra, 1986]. A wider spread of the limited flow irrigation in these regions would not only give greater stability and growth to agriculture, but also lead to greater income generation from the given quantity of water and its wider distribution amongst farmers and labourers than under the existing pattern of use of water. The redesign of the existing irrigation projects in this region as well as the design of new ones keeping this principle in view, will also have a beneficial impact on exploitation of underground water through wells and tubewells. The wider spread of irrigation water and irrigated crops in this vast region will lead to greater possibility of tapping and recycling seeped water, thereby providing a better basis and possibility of private investment in wells and Pumps. Greater

public sector investment in the flow irrigation schemes in this manner would have useful impact on private investment in irrigation and related matters; not otherwise [Rath and Mitra, 1989].

Public investment in major and medium irrigation projects in the proper manner in the dry regions cannot, however, reach more than half the agricultural lands in the region. For the rest, land bunding, terracing and other land development measures are a crying need. These will conserve top soil and rain water, and, through this, lead to Some improvement in farm production. But such soil and rain water conservation measures, carried out on both public and private lands, cannot yield a large enough incremental income over a reasonable period of time in order to qualify as private investment measures with the help of loan finance. In the interest of long term conservation of soil and water, the state has to undertake this task as a public investment. But this in its turn will provide wider basis for private investment in wells in these areas. Public and private investments are in this manner closely tied, the successful execution of the latter being dependent on the full and proper implementation of the former.

In the eastern Indian States the problem is of a different order. Most upland regions have no assured water supply

despite reasonable rainfall in the Kharif season. Design of flow irrigation systems to benefit the uplands deserves greater care and attention than appears to have been given so far by the public sector. As for the plains there, which contain some of the best agricultural lands, several factors, like floods and cyclones, excessive fragmentation of land, poor (or no) roads and communications besides the socio-political hangover of the feudal system of land settlement till the middle of the fifties, are responsible for poor investment in the development of agriculture. Greater attention to flood control than has been bestowed in the past is needed. Despite good underground water potentiality, well (or now tube-well) irrigation was uncommon in these regions until now, and in many parts even today. Apart from floods, poor communications and fragmentation appear to be the major obstacles. Public investment in these, as well as interest or capital subsidy to farmers sinking shallow tubewells, and free dugwells by the public sector on every farmer's land provided the farmers agree to consolidation of holding, may break the age-old inertia of farmers in this type of private capital formation in agriculture [Rath, 1985(b)].

Enough has been said to indicate how successful private investment in the agriculturally undeveloped regions is crucially dependent on acts of public

investment. Unfortunately, the Seventh Plan has put lesser resources on such types of public investment in agriculture than what was achieved during the Sixth Plan, not to mention what was originally planned. There appears to be a conviction that rural development needs IRDP type of programmes rather than rapid growth of agricultural production potential. This is why a substantial part of the planned private investment, and even a part of the reduced public investment, is on these schemes.

One cannot overemphasise the fact that development of agriculture is the first and major method of reducing rural poverty. The rural regions with high incidence of poverty are also regions with poor agricultural development; and regions which had rapid agricultural growth show lower incidence of poverty - indeed, they help the migrant labourer from the poor regions. A properly worked out public sector investment plan in irrigation, soil and water conservation and communication development can at the same time absorb large bodies of wage labour in the poverty stricken regions. Agricultural growth arising out of these acts of public investment can create increasing scope for private investment both in agriculture as well as in other self-employment generating enterprises advocated under IRDP.

Nor is there any reason to feel complacent about the performance of India's agriculture. The large buffer stock should not be misread: one must remember that it has been built over the years entirely through imports. Bad agricultural years in succession can see the usable parts of the stock vanish in no time. The growth rate in agricultural production between 1978-79 and 1983-84, two good years, was 2.13 per cent and of income between these years was only about 1.7 per cent. With no higher, but somewhat lower level of real investment in agriculture, one cannot reasonably expect a much higher growth rate. In fact, the reduced investment of the Sixth Plan is likely to show its impact in the Seventh Plan period. And the still lower investment in the Seventh plan can scarcely ensure a better performance in the following years.

The stagnant level of per capita income in agriculture and the unchanging rate of growth of agricultural production and income - a variant of the late Prof. Raj Krishna's Hindu rate of growth - needs a boost. Greater attention to agricultural investment is the minimum that is needed for the purpose, if the vast mass of Indians living in rural areas is not to be cheated by the urban middle and upper classes of the fruits of economic development.



### FOOT NOTES

1. The data on Net Domestic Product in Agriculture at 1970-71 prices, and the Index of Gross Agricultural Production are presented in Table 1.

2. Refer to Table 2.

3. The actual total Plan outlay figures for any Plan period cannot be directly compared with the projected outlay figures in the Plan document, since the former are at prices of the respective years while the latter are at the pre-Plan year's prices. There is no way of recomputing these at common prices either. Comparison can be attempted only indirectly, and the procedure is explained below:

The Plan documents give sector-wise as well as total Planned Investment figures. This (gross) Investment figure is the Total Plan Outlay minus the Current Outlay during the Plan period. For the total Private and Public Sector and the national total, this (gross) Investment implies the same as the Gross Capital Formation calculated in the *National ACCOUNTS Statistics* published annually by the Central Statistical Organisation. Therefore, it is possible to compare the total Planned Investment in the Public (and Private) Sector in the Plan document with the actual Gross Capital Formation figures in the *National Accounts Statistics*. However, such a comparison is not possible for the individual sub-sections in the Plan document, like agriculture and allied activities. For, the *National Accounts* classify the Gross Capital Formation in the Public (and Private) Sector into sub-sectors (or, what is termed industry-of-use) by taking only direct investments into the sub-sector into account, while in the Plan document many indirect investments also feature in the sub-sectoral investments relating to agriculture, etc., in the Public Sector.

Therefore, in order to estimate the actual Investment in agriculture (in terms of the Plan document) during the Plan period, the following procedure is adopted:

Fourth Plan:- The share of agriculture and allied activities in the Public Sector Plan Outlay was 24 per cent while in the actual it was 23.3 per cent; that is, there was a short-fall of 2.92 per cent in this share.

Assuming that there was an identical short-fall of 2.92 per cent in the share of agriculture in the actual total Public Sector Investment as against planned (which was 23.4 per cent, that is Rs. 3.191 Crores out of Rs. 13,655 Crores), the share of agriculture in actual total Public Sector Investment would be 22.71 per cent only, or Rs. 2,863 Crores (Total actual Public Sector Investment, at 1968-69 prices, = Rs. 12,603 Crores). This is 10.3 per cent less than what was planned in the Public Sector, while the short-fall in total Public Sector Investment was 5.3 per cent.

Fifth Plan:- Unlike the other Plans, the Fifth Plan document presents only total Plan Outlay figures for the Public Sector and its sub-sectors, but no Investments. However, the actual total Gross Capital Formation (i.e., gross investment) in the Public Sector during the Fifth Plan turned out to be equal to 96 per cent of the total planned Outlay in the Public Sector (both at comparable prices). Since Investment in the Public Sector in a Plan constitutes around 85 per cent of the total Plan Outlay, it can be safely inferred that the actual Investment in the Public Sector was somewhat higher than planned. And since the share of agriculture, etc., in the actual Plan Outlay was marginally higher than planned, it can also be inferred that the actual Investment in agriculture, etc., in the Public Sector was somewhat higher than intended.

Sixth Plan:- The share of agriculture, etc., in total Public Sector Outlay was 25.3 per cent in the Plan, and 23.9 per cent in actuality, a short-fall of about 5.5 cent. Therefore, assuming the same percentage short-fall in the share of agriculture, etc., in the actual investment over planned investment in the Public Sector (20.7 per cent), we may say that agriculture's share in the actual Public Sector Investment in the Sixth Plan was 19.55 per cent. This comes to Rs. 13,456 Crores (at 1979-80 prices). This was 22.52 per cent less than what was planned (Rs. 17,367 Crores), while the short-fall in total Public Sector investment during the Sixth Plan was 8.5 per cent only. This implies a relatively significant diversion of plan investment from agriculture, etc., during the plan period.

4. Refer to Table 3 for Plan investments in the Public and Private Sectors in agriculture, etc., for the four Plans, Fourth to Seventh.

5. The detailed data are presented in Table 4.

6. Indeed, the rise in the implicit price index of gross capital formation in agriculture in the public sector during 1980-81 and 1984-85 has been much greater than the rise in the implicit price index for gross capital formation in the total public sector, the former being 78 per cent while the latter was 52 per cent only. This in itself deserves serious attention. For the implicit price indices, see Table 5.

7. These comments are based on Gross Fixed Capital Formation in Agriculture, calculated by deducting the inventories in agriculture from the gross capital formation figures, adjusted for errors and omissions, and presented in columns 16 to 21 and 28 to 33 in Table 4. Separate estimates for Gross Fixed Capital Formation in Agriculture, without adjustments for errors and omissions, are presented in columns 34 to 41 in Table 4. These show the Gross Fixed Capital Formation in Agriculture as a percentage of GDP in agriculture, both at 1970-71 prices, to be about one percentage point higher during the Sixth Plan than towards the latter part of the Fourth Plan, and only about 0.5 percentage point higher than during the Fifth plan.

8. This is estimated by assuming the total loans for tractors to form the same percentage of all term loans to agriculture as in case of total NABARD refinance for agricultural loans by all banks.

9. Refer to Table 4, for the relevant data.

10. The data for the beginning of the seventies, not presented here, relate essentially to term loans by the cooperatives and Land Development Banks. Data from 1973-74 to 1984-85 are given in Table 6.

11. For detailed State-wise data on term loans to agriculture and allied activities see Table 7.

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**Table 1. India's Net Domestic Product in Agriculture at 1970-71 Prices, and Index of Gross Agricultural Production (1970-71=100)**

Year	Net Domestic Product-Agr. (at 1970-71 Price) (Rs. Crores)	Index of Agricultural Production (Triennium ending 1969-70= 100)	Year	Net Domestic Product-Agr. (at 1970-71 Price) (Rs. Crores)	Index of Agricultural Production (Triennium ending 1969-70= 100)
1950-51	9859	58.5	1968-69	14121	97.3
1951-52	10013	59.4	1969-70	15034	103.8
1952-53	10560	62.9	1970-71	16354	111.5
1953-54	11419	71.0	1971-72	16209	111.2
1954-55	11417	72.2	1972-73	15118	102.2
1955-56	11383	71.9	1973-74	16298	112.4
1956-57	11953	76.2	1974-75	15934	108.6
1957-58	11321	70.8	1975-76	18066	125.1
1958-59	12604	82.2	1976-77	16886	116.3
1959-60	12364	80.1	1977-78	19046	132.9
1960-61	13143	86.7	1978-79	19569	138.0
1961-62	13234	86.8	1979-80	16886	117.0
1962-63	12875	85.3	1980-81	19071	135.3
1963-64	13204	87.2	1981-82	19860	142.9
1964-65	14429	96.9	1982-83	19215	137.5
1965-66	12279	80.8	1983-84	21461	156.4
1966-67	12084	80.7	1984-85	21218	155.0
1967-68	14043	98.9	1985-86	n.a.	156.0

Sources: 1. NDP from National Accounts Statistics 1970-71 - 1984-85. January 1987. C.S.O., Government of India, Statement 6, and Corresponding Tables in earlier volumes.

2. Index of Agricultural Production from Indian Agriculture in Brief, 20th Edition, Directorate of Economics and Statistics, Ministry of Agriculture and Rural Development. Govt. of India. Table 1.72 upto 1981-82, and Economic Survey. 1986-87, Govt. of India, Appendix Table 1.4 from 1982-83 to 1985-86.

**Table 2. Projected Plan Outlay and Actual Outlay on Agriculture and Related Fields in the Public Sector in the Successive Plans Since the Fourth Five Year Plan**

(Rs. Crore)

	Planned Outlay				Actual Outlay		
	Fourth Plan	Fifth Plan	Sixth Plan	Seventh Plan	Fourth Plan	Fifth Plan	Sixth Plan
1. Agriculture & Allied Sectors	2728 (17.2)	4643.59 (11.8)	5695.07 (5.8)	10573.62 (5.9)	2320.4 (14.7)	4864.9 (12.3)	6623.5 (6.1)
2. Rural Development	-	-	5363.73 (5.5)	9074.22 (5.04)	-	-	6996.8 (6.4)
3. Special Area Programmes	-	-	1480.00 (1.5)	3144.69 (1.8)	-	-	1580.3 (1.4)
4. Irrigation and Flood Control	1087 (6.8)	3440.18 (8.8)	12160.03 (12.5)	16978.65 (9.4)	1354.1 (8.6)	3876.5 (9.8)	10929.9 (10.0)
Sub-Total	3815 (24.0)	8083.77 (20.6)	24698.83 (25.3)	39771.18 (22.1)	3674.5 (23.3)	8741.4 (22.2)	26130.5 (23.9)
5. Total Plan Outlay	15902 (100)	39287.49 (100)	97500 (100)	180000 (100)	15778.8 (100)	39426.2 (100)	109291.7 (100)

Note: The planned Outlay for the Fourth, Sixth and Seventh Five Year Plans are in 1968-69, 1979-80 and 1984-85 prices, respectively. For the Fifth Plan they are as follows: for 1974-75 they are at current prices, and for the remaining four years, 1975-79, at 1975-76 prices. The outlay figures exclude inventories for the Fifth Plan.

Sources: Planned Outlay:- (i) Fourth Five Year Plan 1969-74, Table I. P. 53; (ii) Fifth Five Year Plan, 1974-79, P. 52; (iii) Sixth Five Year Plan, 1980-85, Annexure 4.3; (iv) Seventh Five Year Plan, 1985-90, Vol. I, Table 3.4(a)

Actual Outlay:- Economic Survey, 1986-87 (Govt. of India), Appendix Tables 2.4 - 2.6. Figures in brackets are percentages to total.

**Table 3. Investment in Public and Private Sectors in Agriculture and the Total Plan in the Fourth, Fifth, Sixth and Seventh Five Year Plans**

(Rs. Crore)

Item	4th Plan	5th Plan	6th Plan	7th Plan
1. Total Plan Investment	22635	N.A.	158710	322366
2. Total Plan Investment in Public Sector	13655	39287	84000	154218
3. Total Plan Investment in Private Sector	8980	N.A.	74710	168148
4. Total Planned Agricultural Investment	4791	N.A.	33468	61622
5. Total Planned Agricultural Investment in Public Sector	3191	8084	17367	27574
6. Total Planned Agricultural Investment in Private Sector	1600	N.A.	16101	30048
Actual Capital Formation: (at comparable Prices)				
7. Total Gross Domestic Capital Formation (GDCF) in India	33343	83407	145204	
8. GDCF in Agriculture	6407	15352	26689	
9. GDCF in Public Sector	12933	37787	68815	
10. GDCF in Public Sector in Agriculture	2094	4820	7458	
11. GDCF in Private Sector	20410	45620	76389	
12. GDCF in Agriculture in Private Sector	4313	10532	19231	
Actual Capital Formation: (at 1970-71 Prices)				
13. Total GDCF	37548	48252	63325	
14. Total GDCF in Agr. Sect.	7109	8939	11545	
15. Total GDCF in Pub. Sect.	12603	22066	30919	
16. GDCI; in Agr. in Pub. Sect.	2053	2766	3177	
17. GDCI in Private Sector	24945	26186	32406	
18. GDCI: in Private Sector in Agriculture	5056	6173	8368	
19.(2) as % of (1)	60.3	N.A.	52.9	47.8
20.(3) as % of (1)	39.7	N.A.	47.1	52.2
21.(4) as % of (1)	21.2	N.A.	21.1	19.1
22.(5) as % of (2)	23.4	20.6	20.7	17.9
23.(5) as % of (4)	66.6	N.A.	51.9	44.7
24.(6) as % of (3)	17.8	N.A.	21.6	17.9
25.(6) as % of (4)	33.4	N.A.	48.1	55.3
26.(7) as % of (1)	147.3	N.A.	91.5	
27.(9) as % of (7)	38.8	45.3	47.4	
28.(9) as % of (2)	94.7	96.2	81.9	
29.(8) as % of (7)	19.2	18.4	18.4	
30.(10) as % of (9)	16.2	12.8	10.8	
31.(10) as % of (8)	32.7	31.4	27.9	
32.(11) as % of (7)	61.2	54.7	52.6	
33.(11) as % of (3)	227.3	N.A.	102.2	
34.(12) as % of (11)	21.1	23.1	25.2	
35.(12) as % of (8)	67.3	68.6	72.1	
36.(12) AS % of (6)	269.6	N.A.	119.4	
37.(15) as % of (13)	33.6	45.7	48.8	
38.(17) as % of (13)	66.4	44.3	51.2	
39.(14) as % of (13)	18.9	18.5	18.2	
40.(16) as % of (15)	16.3	12.5	10.3	
41.(16) as % of (14)	28.9	30.9	27.5	
42.(18) as % of (17)	20.3	23.6	25.8	
43.(18) as % of (14)	71.1	69.1	72.5	

Source: The figures in rows 1 to 6 are from the respective Plan documents. The data for the Fifth Plan refer to total outlays and not investment. The data in rows 13 to 18 are taken from the different volumes of the National Accounts Statistics (C.S.O.). The figures for 1969-70 for the Public Sector have been guessed by us. The data for agriculture include fishing forestry and logging as well. The data in row 7 to 12 are calculated by using the implicit Price Indices in the National Accounts Statistics.

Table 4. Gross Domestic Product and Domestic Capital Formation in Agriculture, 1960-85

Year	Gross Domestic Capital Formation in Agriculture														
	Gross Domestic Product in Agriculture			Gross Domestic Capital Formation in Agriculture											
	at Current Prices	at 70-71 Prices	at Current Prices	Total at Current Prices	Total at 70-71 Prices	Public Sector at Current Prices	Public Sector at 70-71 Prices	Private Sector at Current Prices	Private Sector at 70-71 Prices	(4) as % of (2)	(5) as % of (3)	(6) as % of (2)	(7) as % of (3)	(8) as % of (2)	(9) as % of (3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1960-61	6751	13395	395	736					5.9	5.5					
1961-62	6966	13500	376	660					5.4	4.9					
1962-63	7111	13169	428	766					6.0	5.8					
1963-64	8235	13500	480	791					5.8	5.9					
1964-65	10091	14753	583	927					5.8	6.3					
1965-66	9798	12643	721	1104					7.4	8.7					
1966-67	11713	12474	799	951					6.8	7.6					
1967-68	15542	14441	838	955					5.4	6.6					
1968-69	14146	14539	949	1049					6.7	7.2					
1969-70	15539	15477	1118	1179					7.2	7.6					
1970-71	16778	16778	1298	1298					7.7	7.7					
1971-72	17380	16661	1396	1323	329	329	969	969	7.7	7.7	2.0	2.0	5.7	5.7	
1972-73	19169	15601	1648	1444	382	349	1014	974	8.0	7.9	2.2	2.1	5.8	5.8	
1973-74	25879	16805	2034	1519	505	419	1143	1025	5.6	9.3	2.7	2.7	5.9	6.6	
1974-75	28029	16462	1945	1230	567	416	1467	1103	7.9	9.0	2.2	2.5	5.7	6.5	
1975-76	26645	18613	2119	1217	591	358	1354	872	6.9	7.5	2.0	2.2	4.9	5.3	
1976-77	27258	17464	3261	1795	718	408	1401	809	8.0	6.5	2.7	2.2	5.3	4.3	
1977-78	31372	19651	3561	1883	1013	561	2248	1234	12.0	10.3	3.7	3.2	8.3	7.1	
1978-79	32095	20218	4782	2394	1206	644	2355	1239	11.3	9.6	3.8	3.3	7.5	6.3	
1979-80	32990	17578	4717	2056	1391	683	3391	1711	14.9	11.8	4.3	3.4	10.6	8.4	
1980-81	40838	19804	5762	2274	1618	690	3099	1366	14.3	11.7	4.9	3.9	9.4	7.8	
1981-82	44261	20654	5967	2134	1845	690	3917	1584	14.1	11.5	4.5	3.5	9.6	8.0	
1982-83	46562	20032	6239	2068	1964	625	4003	1509	13.5	10.3	4.4	3.0	9.1	7.3	
1983-84	58908	22337	7480	2232	2143	566	4096	1502	13.4	10.3	4.6	2.8	8.8	7.5	
1984-85	60147	22159	8529	2370	2296	539	5184	1693	12.7	10.0	3.9	2.4	8.8	7.6	
					2547	536	5982	1834	14.2	10.7	4.2	2.4	10.0	8.3	

(Contd.)

Table 4. Gross Domestic Product and Domestic Capital Formation in Agriculture, 1960-85 (contd.)

Year	Changes in Inventory				Gross Domestic Fixed Capital Formation in Agriculture*									
	Total		Public Sector		Private Sector		Total		Public Sector		Private Sector			
	at Current Prices	at 70-71 Prices	at Current Prices	at 70-71 Prices	at Current Prices	at 70-71 Prices	at Current Prices	at 70-71 Prices	at Current Prices	at 70-71 Prices	at Current Prices	at 70-71 Prices	at Current Prices	at 70-71 Prices
(1)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)		
1960-61	18	33					377	703						
1961-62	1	2					375	658						
1962-63	10	17					418	749						
1963-64	15	24					465	767						
1964-65	9	19					574	908						
1965-66	14	19					707	1085						
1966-67	13	18					786	933						
1967-68	6	7					832	948						
1968-69	54	53					895	996						
1969-70	49	46					1069	1133						
1970-71	52	52	2	2	50	50	1246	1246	327	327	919	919		
1971-72	64	65	8	7	56	58	1332	1258	374	342	958	916		
1972-73	109	107	-19	-16	128	123	1539	1337	524	435	1015	902		
1973-74	164	122	8	6	156	116	1870	1397	559	410	1311	987		
1974-75	173	110	32	19	141	91	1772	1120	559	339	1213	781		
1975-76	299	205	26	15	173	190	1820	1012	692	397	1128	615		
1976-77	416	249	-4	-2	420	251	2845	1546	1017	563	1828	983		
1977-78	232	130	16	9	216	121	3329	1753	1190	635	2139	1118		
1978-79	720	415	45	22	675	397	4062	1979	1346	661	2716	1318		
1979-80	651	337	44	19	607	318	4066	1719	1574	671	2492	1048		
1980-81	830	385	24	9	806	376	4932	1889	1821	681	3111	1208		
1981-82	1003	416	78	25	925	391	4964	1718	1886	600	3078	1118		
1982-83	892	356	36	10	856	346	5347	1712	2107	556	3240	1156		
1983-84	1019	348	40	9	981	339	6461	1884	2256	530	4205	1354		
1984-85	1730	519	68	14	1662	505	6799	1851	2479	522	4320	1329		

(Contd.)

Table 4. Gross Domestic Product and Domestic Capital Formation in Agriculture, 1960-85 (concl.)

Gross Domestic Fixed Capital Formation in Agriculture**															
(1)	Gross Domestic Fixed Capital Formation in Agriculture**														
	Public Sector							Private Sector							
(22) as % of (2)	(23) as % of (3)	(24) as % of (2)	(25) as % of (3)	(26) as % of (2)	(27) as % of (3)	(28) as % of (2)	(29) as % of (3)	(30) as % of (2)	(31) as % of (3)	(32) as % of (2)	(33) as % of (3)	(34) as % of (2)	(35) as % of (3)	(36) as % of (2)	(37) as % of (3)
(1)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)
1960-61	5.6	5.2							406	692				6.0	5.2
1961-62	5.4	4.9							393	646				5.6	4.8
1962-63	5.9	5.7							438	702				6.2	5.3
1963-64	5.6	5.7							480	749				5.8	5.5
1964-65	5.7	6.2							566	834				5.6	5.7
1965-66	7.2	8.6							657	949				6.7	7.5
1966-67	6.7	7.5							747	893				6.4	7.2
1967-68	5.4	6.6							882	991				5.7	6.9
1968-69	6.3	6.9							913	1009				6.5	6.9
1969-70	6.9	7.3							1047	1112				6.7	7.2
1970-71	7.4	7.4	2.0	2.0	5.4	5.4	775	775	1102	1102	4.6	4.6		6.6	6.6
1971-72	7.7	7.6	2.2	2.1	5.5	5.5	874	829	1248	1171	5.0	4.9		7.2	7.0
1972-73	8.0	8.6	2.7	2.8	5.3	5.8	901	804	1425	1239	4.7	5.1		7.4	7.9
1973-74	7.2	8.3	2.2	2.4	5.0	5.9	1074	811	1633	1221	4.1	4.9		6.3	7.3
1974-75	6.3	6.8	2.0	2.1	4.3	4.7	1254	800	1813	1139	4.5	4.8		6.5	6.9
1975-76	6.8	5.4	2.6	2.1	4.2	3.3	1411	800	2103	1197	5.3	4.3		7.9	6.4
1976-77	10.4	8.8	3.7	3.2	6.7	5.6	1717	959	2734	1522	6.3	5.5		10.0	8.7
1977-78	10.6	8.9	3.8	3.2	6.8	5.7	1777	951	2967	1586	5.7	4.9		9.5	8.1
1978-79	12.7	9.8	4.2	3.3	8.5	6.5	2177	1097	3523	1758	6.8	5.4		11.0	8.7
1979-80	12.3	9.8	4.7	3.8	7.6	6.0	2566	1130	4140	1801	7.8	6.4		12.5	10.2
1980-81	12.1	9.5	4.5	3.4	7.6	6.1	3056	1201	4877	1882	7.5	6.1		11.9	9.5
1981-82	11.2	8.3	4.2	2.9	7.0	5.4	3502	1221	5388	1821	7.9	5.9		12.2	8.8
1982-83	11.5	8.5	4.5	2.7	7.0	5.8	3884	1258	5991	1814	8.3	6.4		12.9	9.1
1983-84	10.9	8.4	3.8	2.3	7.1	6.1	4879	1456	7135	1986	8.3	6.6		12.1	8.9
1984-85	11.3	8.4	4.1	2.4	7.2	6.0	5646	1578	8125	2100	9.4	7.1		13.5	9.5

Source: Taken from different volumes of the National Accounts Statistics (C.S.O.) except for Public Sector inventories; at current prices, made available prices, using the same implicit price index as for total GDCF in Agriculture in the Public Sector.

\* Adjusted for errors and omissions. For Gross Domestic Fixed Capital Formation, the inventories have been deducted from GDCF (with adjustments for errors and omissions).

\*\* Without adjustment for errors and omissions.



**Table 5. Implicit Price Indices**

Year	GDP in Agriculture	GDCF in Agriculture	GDCF in Public Sector in Agriculture	GDCF in Private Sector in Agriculture
(1)	(2)	(3)	(4)	(5)
1970-71	100.0	100.0	100.0	190.0
1971-72	104.3	105.5	109.5	104.1
1972-73	122.9	114.1	120.5	111.5
1973-74	154.0	133.9	136.3	133.0
1974-75	170.3	158.1	165.1	155.3
1975-76	143.1	174.1	176.0	173.2
1976-77	156.1	181.7	180.6	182.2
1977-78	159.6	189.1	187.3	190.1
1978-79	158.7	199.7	203.7	198.2
1979-80	187.7	229.4	234.5	226.9
1980-81	206.2	253.4	267.4	247.3
1981-82	214.3	279.6	314.2	265.3
1982-83	232.4	301.7	378.6	272.7
1983-84	263.7	335.1	426.0	306.2
1984-85	271.4	359.9	475.2	326.2

Source: Data in Table 4 at current and at 1970-71 prices

**Table 6. Total Term Loans to Agriculture and Allied Activities as Percent of Gross Fixed Capital Formation in Agriculture and Fisheries in the Private Sector**

Year	Gross Fixed Capital Formation in Agriculture & Fisheries in Private Sector (Rs. Crore)	Total Term Loans to Agriculture & allied Activities by Financial Institutions (Rs. Crore)	(3) as Per cent of (2)
(1)	(2)	(3)	(4)
1973-74	1378	437.77	31.8
1974-75	1283	427.15	33.3
1975-76	1199	512.90	42.8
1976-77	1924	680.58	35.4
1977-78	2255	680.64	30.2
1978-79	2817	872.09	31.0
1979-80	2593	1109.85	42.8
1980-81	3242	1412.66	43.6
1981-82	3217	1651.98	51.4
1982-83	3396	1593.14	46.9
1983-84	4401	1908.94	43.4
1984-85	4547	2435.42	53.6

Source: Gross Fixed Capital Formation figures taken from col. 26 of Table 4 and GDCF in Fishing added to it. Total Term Loans to Agriculture and allied activities (including animal husbandry and fishing) obtained from the National Bank for Agriculture & Rural Development (NABARD).

**Table 7. Percentage Shares of Different States in the Medium and Long Term Loans to Agriculture and Allied Activities by (1) Cooperative and Land Development Banks, (2) Commercial Banks Including RRBs, and (3) Total Institutional Term Loans**

No.	STATES	1973-74			1974-75			1975-76			1976-77			1977-78			1978-79		
		(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1.	Haryana	4.8	5.0	4.9	5.3	6.4	5.6	5.1	4.9	5.0	5.3	7.2	6.0	6.7	7.3	6.9	6.8	7.5	7.1
2.	Himachal Pradesh	1.2	0.2	0.8	1.0	0.5	0.9	1.1	0.5	0.9	0.8	0.7	0.8	0.9	0.4	0.7	1.1	0.5	0.8
3.	Jammu & Kashmir	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.4	0.3
4.	Punjab	7.6	6.5	7.1	6.2	5.7	6.0	5.9	8.6	6.9	7.0	9.5	7.9	4.9	10.5	7.2	5.3	10.8	8.1
5.	Rajasthan	2.9	7.0	4.8	3.1	5.7	3.9	2.5	5.1	3.5	3.2	5.1	3.9	5.2	6.0	5.5	4.7	6.7	5.7
6.	Assam	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.5	0.3	0.3	0.2	0.3	0.2	0.2	0.2
7.	Bihar	6.1	5.1	5.6	5.0	3.3	4.5	6.3	4.1	5.5	4.7	5.6	5.1	2.1	4.9	3.3	2.1	4.8	3.4
8.	Orissa	1.9	0.5	1.3	2.9	1.0	2.4	2.2	1.1	1.8	4.1	1.5	3.2	3.0	2.1	2.6	3.9	2.4	3.2
9.	West Bengal	0.6	4.5	2.4	0.8	2.0	1.2	1.5	2.8	2.0	2.0	1.5	1.8	3.0	4.1	3.5	5.4	3.2	4.3
10.	Madhya Pradesh	7.4	6.5	7.0	8.1	7.9	8.0	6.2	7.8	6.8	7.5	7.6	7.5	4.2	7.2	5.4	5.7	5.1	5.4
11.	Uttar Pradesh	11.5	14.2	12.8	11.4	13.8	12.2	10.7	11.3	10.9	12.0	13.2	12.4	15.5	15.5	15.5	13.3	15.4	14.3
12.	Gujarat	13.5	11.3	12.4	24.8	5.3	19.0	10.0	4.6	8.0	4.5	4.5	4.5	9.2	5.4	7.6	6.3	6.1	6.2
13.	Maharashtra	11.2	19.3	15.1	7.5	12.6	9.0	17.2	10.0	14.5	9.5	9.2	9.4	7.7	9.0	1.2	10.0	8.3	9.1
14.	Andhra Pradesh	7.1	4.5	5.8	5.4	8.8	6.4	12.4	7.6	10.6	16.5	7.0	12.9	18.7	5.0	13.5	13.5	7.2	10.4
15.	Karnataka	9.3	7.3	8.4	7.2	13.1	9.0	9.5	15.5	11.7	11.7	13.4	12.4	6.1	9.5	7.5	4.4	10.4	7.4
16.	Kerala	3.8	1.6	2.7	3.4	5.6	4.0	3.2	6.0	4.3	4.9	4.2	4.6	7.0	3.6	5.6	10.1	3.6	7.3
17.	Tamil Nadu	9.4	5.4	7.5	7.5	6.1	7.0	5.8	8.0	6.6	5.9	6.4	6.1	5.0	5.9	5.1	5.9	5.8	5.9
18.	Others	1.5	0.9	1.2	0.2	1.8	0.6	0.2	1.7	0.8	0.1	2.8	1.1	0.2	2.2	1.0	0.1	1.6	0.9
19.	India	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Rs.Cr.)		229.23	208.54	437.77	298.99	128.16	427.15	320.51	192.39	512.90	426.71	253.87	680.58	399.34	251.30	680.64	437.11	434.98	872.09

**Table 7. Percentage Shares of Different States in the Medium and Long Term Loans to Agriculture and Allied Activities by (1) Cooperative and Land Development Banks, (2) Commercial Banks Including RRBs, and (3) Total Institutional Term Loans (Concl.)**

No.	STATES	1979-80			1980-81			1981-82			1982-83			1983-84			1984-85		
		(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1.	Haryana	6.6	7.7	7.1	6.3	6.5	6.4	6.3	5.4	5.8	5.2	5.2	5.2	6.1	5.9	6.0	5.7	5.1	5.3
2.	Himachal Pradesh	0.7	0.8	0.8	1.0	0.6	0.8	1.0	0.8	0.9	0.8	0.7	0.8	1.1	0.6	0.8	1.2	0.5	0.8
3.	Jammu & Kashmir	0.2	0.5	0.3	0.2	0.7	0.4	0.2	0.8	0.6	0.2	0.8	0.5	0.2	0.8	0.5	0.2	0.7	0.5
4.	Punjab	5.7	14.2	9.7	6.6	14.7	11.2	7.0	11.6	9.7	5.9	10.3	8.1	7.7	11.8	10.1	7.4	8.3	8.0
5.	Rajasthan	5.9	5.6	5.7	8.2	5.6	6.7	9.0	5.5	6.9	8.4	6.7	7.6	3.8	6.3	5.3	5.9	5.4	5.6
6.	Assam	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.4	0.3	0.3	0.6	0.5	0.3	0.5	0.4
7.	Bihar	2.1	4.3	3.1	2.7	3.7	3.3	4.6	4.5	4.6	2.8	5.7	4.2	2.0	4.1	3.3	2.3	5.7	4.5
8.	Orissa	5.7	1.5	3.7	3.7	5.1	4.6	3.0	3.2	3.1	3.1	2.6	2.8	3.0	2.4	2.7	1.9	3.3	2.8
9.	West Bengal	1.8	1.9	1.9	1.5	1.9	1.7	1.5	1.9	1.8	0.9	1.8	1.4	2.2	2.0	2.0	1.0	1.7	1.4
10.	Madhya Pradesh	0.1	7.0	8.6	4.8	6.2	5.6	4.4	5.1	4.8	4.8	6.4	5.6	6.1	2.9	4.2	5.4	5.9	5.7
11.	Uttar Pradesh	21.8	14.6	18.4	13.1	14.1	13.7	13.3	14.6	14.0	11.8	14.0	12.9	12.4	10.8	11.5	12.4	12.4	12.4
12.	Gujarat	3.5	6.7	5.0	2.9	5.6	4.5	10.1	4.5	6.8	12.0	6.3	9.2	9.2	0.4	7.5	4.5	6.0	5.5
13.	Maharashtra	9.2	9.0	9.1	14.4	7.0	10.1	11.4	8.5	9.7	12.6	7.4	10.1	13.7	8.8	10.8	15.2	8.8	11.0
14.	Andhra Pradesh	11.2	6.5	9.0	16.6	6.6	10.8	11.5	6.6	8.6	12.4	7.6	10.0	10.4	8.5	9.3	11.0	8.2	9.2
15.	Karnataka	3.9	7.9	5.8	5.9	7.2	6.6	4.5	7.7	6.4	5.6	9.8	7.6	7.2	10.8	9.3	8.2	11.3	10.2
16.	Kerala	9.1	3.6	6.5	10.4	4.7	7.2	9.0	4.3	6.2	9.2	4.1	6.7	11.3	3.6	6.8	10.5	3.0	5.6
17.	Tamil Nadu	2.4	6.4	4.3	1.4	8.5	5.5	2.8	13.6	9.1	3.9	8.2	6.0	3.1	8.9	6.5	6.7	10.9	9.5
18.	Others	0.1	1.7	0.9	0.2	1.2	0.8	0.2	1.1	0.7	0.2	1.9	1.0	0.2	4.8	2.9	0.2	2.3	1.6
19.	India	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Rs.Cr.)		589.84	520.01	1109.85	600.39	812.27	1412.66	683.00	968.98	1651.98	808.78	784.36	1593.14	780.20	1128.74	1908.94	830.95	1604.47	2434.42

Table 7A. Percentage Shares of Different States in the Medium and Long Term Loans to Agriculture and Allied Activities by (2.1) Commercial Banks, and (2.2) RRBs

No.	STATES	1980-81		1981-82		1982-83		1983-84		1984-85	
		(2.1)	(2.2)	(2.1)	(2.2)	(2.1)	(2.2)	(2.1)	(2.2)	(2.1)	(2.2)
1.	Haryana	6.7	4.2	5.7	2.6	5.5	3.5	6.6	1.6	5.2	4.1
2.	Himachal Pradesh	0.6	1.1	0.7	1.7	0.6	1.3	0.5	1.3	0.4	1.2
3.	Jammu & Kashmir	0.5	1.5	0.7	2.0	0.4	2.8	0.4	3.0	0.4	3.0
4.	Punjab	16.0	-	13.0	-	12.3	-	13.4	0.1	9.3	0.4
5.	Rajasthan	4.9	12.9	4.6	13.2	6.0	10.2	5.9	9.6	4.9	9.3
6.	Assam	0.1	0.5	0.2	1.2	0.3	0.8	0.5	1.2	0.5	0.5
7.	Bihar	2.5	17.8	2.9	19.5	3.0	20.4	2.2	17.3	4.5	15.3
8.	Orissa	5.3	3.6	3.0	5.7	1.7	7.2	2.0	5.0	3.4	2.6
9.	West Bengal	1.8	2.9	1.8	3.0	1.7	2.3	1.6	4.2	1.6	2.1
10.	Madhya Pradesh	6.3	5.1	5.1	5.3	6.4	6.0	2.3	7.3	5.2	11.5
11.	Uttar Pradesh	13.7	18.1	13.8	21.2	12.2	23.4	8.9	23.8	10.8	26.1
12.	Gujarat	6.0	0.5	4.9	0.6	7.3	0.7	7.1	1.5	6.4	2.1
13.	Maharashtra	7.6	-	9.4	-	8.9	-	10.1	0.3	9.6	2.4
14.	Andhra Pradesh	6.0	12.7	6.3	9.3	7.8	7.0	8.7	7.1	8.3	7.2
15.	Karnataka	7.2	8.3	7.7	7.7	10.1	8.4	10.7	11.9	11.5	9.6
16.	Kerala	4.8	4.6	4.4	3.4	4.2	3.6	3.8	2.2	3.1	2.5
17.	Tamil Nadu	8.9	4.2	14.8	2.4	9.5	1.6	9.9	1.8	12.3	-
18.	Others	1.1	2.0	1.0	1.2	2.1	0.8	5.4	0.8	2.6	0.1
19.	India	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (Rs.Cr.)		744.83	67.44	872.50	96.48	659.92	124.44	985.77	142.97	1426.12	178.35

# INSTITUTIONAL CREDIT FOR AGRICULTURE IN INDIA

Nilakantha Rath\*

*Highly unequal regional distribution characterises not only loans from financial institutions for investment in agriculture, but also for current production. The induction of the nationalised banks and subsequently of the RRBs into the field of agricultural credit has not restored regional equality; in fact, it has worsened it. There is greater dependence on own savings in developed regions; in underdeveloped ones very little financial resources are demanded and used. Commercial banks can effectively help only a limited number of large cultivators. The co-operative financial institutions are best suited to serve the vast body of farmers; but, improvements are needed in their organisation and methods of advancing credit, supervising use of loans, and recovering them.*

Rural credit in India has undergone a sea change in the post - Independence period. During the century and more preceding Independence, the matter was seen and discussed as a problem of burden of debt. This was unavoidable: the rural economy was not only abjectly poor, but subject to great fluctuations in production and income due to weather and changes in the price level. The agricultural economy was stagnant. As a result, loans were incurred essentially to meet exigencies of situations arising out of these forces that affected family living as well as the possibility of carrying out the normal agricultural operations. The loans were mainly for family consumption. Production credit, which formed a smaller part of total loan operations even as late as 1951-52, was more for what is today called capital formation, that is, sinking of a well and buying of bullocks. Loans for current agricultural operations, now-a-days popularly known as crop loans, were insignificant. There was hardly any purchase of current material inputs over and above what the farm household possessed. Sources of loans were mainly the private money lenders; institutional loans, only from cooperative credit societies, formed a miniscule part of total loans. Even Government Taccavi loans, more a State action during a period of almost eighty years preceding Independence, was largely to cultivators, mainly the bigger ones, to meet exigencies arising out of crop failure, flood, cyclone, etc.

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Since Independence, with planned economic development, the concern has been with credit, not burden of debt. Accentuated capital investment and technological innovations in crops and inputs have resulted in a rate of growth of agriculture unknown in the past<sup>1</sup> [Blyn, 1966]. Both, crop loans and medium and long term loans, have become important in the process. At the same time, continuous inflation, at a low or high rate, over the last forty years, has obviated the need for any large scale debt adjustment. In this process of growth and expansion, institutional credit has come to occupy a dominant place.

As noted in the previous issue, institutional credit has come to form the major proportion of the total fixed capital formation in agriculture [Rath, 1989, Pp. 64-83]. Indeed, the planners appear to have come to depend more on institutional credit for this purpose in recent years.

Similarly, crop loans have come to occupy an increasing proportion of all loans in rural areas : as against 6 per cent in 1950-51, crop loans had increased to 20 per cent of all loans in 1971, the latest year for which such data are available.<sup>2</sup> Indeed, while in 1950-51 crop loans were equal to only one-fourth of (medium and long) term loans, by the middle of the eighties the total crop loans in a year were

twice as high as the total term loans disbursed during a year by all financial institutions.

Technological improvements in agricultural production have led to the farmers resorting to loan finance to a much larger extent than before. Visualising this possibility in 1954, the Reserve Bank of India's Rural Credit Survey Committee recognised that private money lenders cannot and should not be depended upon to fill this need. The Committee strongly advocated that the cooperative institutions should be strengthened and enabled to supply this credit. The Committee's slogan was: cooperation has failed; cooperation must succeed.

Since then, there has been a basic policy change in this field. Instead of the co-operatives being the only rural credit institution, two more have been inducted into the field: the commercial banks since 1968 and more so after nationalisation of the major banks in 1969, and the Regional Rural Banks since 1974-75. As a result, in most parts of India today, the countryside has three different types of credit institutions, and many more individual institutions under these heads, competing to help cultivators with short and long term credit for their agricultural activity. All these institutions are under very elaborate Government and Reserve Bank

control in regard to the extent of their participation in rural credit and the terms and conditions of such participation. The net result has not necessarily been the best, and quite often not what was desired. Indeed, there is often a feeling of confusion and helplessness at the level of the institutions and a feeling of neglect at various levels of agriculturists, particularly the smaller ones. A brief review of the performance of the credit institutions in the matter of crop and term loans may be useful in ascertaining the achievements as well as the sources of difficulty.

Let us begin with short term credit to agriculture - briefly, crop loans. Total crop loans by all financial institutions to agriculturists constituted about 1.5 per cent of the total value of all material inputs in agriculture in a year, during the period 1973-74 to 1984-85. If we add the wages paid to hired workers in agriculture to this total material cost (owned and purchased), the percentage covered by crop loans comes to about 10 per cent. This has happened despite a more than fivefold rise in the total value of all material inputs between 1970 and 1985. The crop loans as a percentage of this rose from about 13 per cent to 15 per cent around 1976-77, and have stayed there (Table 1).

But if we express the total crop loans as a percentage of the total value of only five inputs in agriculture, namely chemical fertilizers, insecticides, electricity, diesel oil, and irrigation charges, all of which are purchased by the farmer and which have become increasingly important over the years, we find that crop loans covered more than 80 per cent of the total value of these inputs in the first three years of the seventies, but declined sharply to about 45 per cent from 1975-76, following a sharp rise in prices of fertilizers, insecticides and diesel oil. In the Sixth Plan period, crop loans covered only about 35 per cent of the actual value of these five inputs (Table 1). Indeed, since 1975-76, the total crop loan has been less than the total value of chemical fertilizers alone. It appears that despite the increase in the total cost of these (the share of the five inputs in all farm inputs increased from 15 per cent in 1973-74 to 43 per cent in 1984-85), the crop loans have not increased proportionately, but have stayed at a given level of all material input costs, farm supplied and purchased.

This raises several questions that cannot be answered easily. In the first place, it raises the question about the basis for sanction of crop loans. The bulk (about 67 per cent) of the short term credit to agriculture and allied activities is provided by the Primary Agricultural

Credit Societies (PACS) (Table 2). For the approval of crop loans to members, the societies use the normal credit limit for individual crops, worked out by an expert committee of the concerned District Central Co-operative Bank (DCCB) once every two years. The DCCB Committee is expected to specify a certain percentage of the out-of-pocket expenses on inputs that would be required for a crop in the region as the normal credit limit. Could it be that the DCCB Committees specify a fixed percentage of all material expenses whether purchased or otherwise, for whatever reasons? It is also possible that the quantities of inputs assumed by the Committee in specifying the normal credit limit are quite different from what is actually used at the farm level.

It is also quite likely that the total loan fund available to farmers is more than the total sum disbursed during a year for the purpose. This would be so if the overdue amount of the sum scheduled for repayment is in effect being used by the borrowers as short term credit, thereby increasing the financial resources available to the farmers as a group for purchase of inputs. The amount overdue at the end of a year in case of all PACS in India plus the actual disbursement of short term loans in the following year, varied between 39 and 66 per cent of the total cost of the five purchased inputs

during the period 1974-75 to 1984-85 (Table 3). Of course, one cannot say that the entire overdue sum has accrued to the borrowers, and they are not repaying it simply because they wish to use it in their farms. But an element, possibly a large element, of this in the overdue amount cannot be ruled out.

Whatever the reasons, it appears that ever since the steep rise in prices of fertilizer and diesel oil, crop loans have ceased to cover the bulk of the cost of the five purchased materials, not to speak of all the purchased inputs including labour. It has further declined in the Sixth Plan period. Farmers obviously are depending on their own resources or partly on non-institutional sources of credit for the purpose. While it would be fair to expect farmers in a developing economy to finance a larger part of their current farm expenses from their own sources, it would be useful to know what in fact has been happening over the years.

The first thing one notices is the wide regional disparity in crop (short term) loan disbursement to agriculture, compared to the share of different regions in the total gross cropped area of the country. In 1982-83, the latest year for which gross cropped area figures were available, the four States of eastern India - Assam, West Bengal, Orissa, Bihar and the two central Indian States of Madhya



Pradesh and Rajasthan, accounted for more than 40 per cent of the total gross cropped area (Table 2). But they received only about 16 per cent of the total short term credit (Table 4). As against this, six other States - Punjab and Haryana in the north and the four southern States of Kerala, Tamil Nadu, Andhra Pradesh and Karnataka, with only about 25 per cent of the total gross cropped area, received 56 to 60 per cent of the total crop loans. The disparity persists even if the comparison is made on the basis of the gross irrigated area. There is a *prima facie* suggestion here that most farmers, including irrigated farmers, in the agriculturally under-developed regions do not get access to institutional sources of short term credit. The same may be happening to many farmers, though to a lesser extent, in the relatively more developed and/or irrigated agricultural regions.

A more interesting way of examining this question may be mentioned here. As noted earlier, the total crop loans actually disbursed during a year was found to be less than the total value of chemical fertilizers used in agriculture (as given by the CSO), in the years since 1970-71, and particularly since 1974-75. Since State-wise distribution of the total fertilizer consumption and of its total value is available, it would be useful to compare the actual crop loan disbursement in a State as a percentage of the total value of

fertilizers used in the country (as given by the CSO) with the State's share in total fertilizer consumption (Table 5). Comparison of these data show that there was a close resemblance between the distribution of total fertilizer consumption among States, and the States' crop loans as percentages of the total value of fertilizer consumed in the farm sector in the country. In States like Karnataka and Tamil Nadu, the total crop loans were approximately equal to the total expenditure on fertilizers. In States like Kerala and Maharashtra, in particular, the crop loans were considerably in excess of the total expenditure on fertilizers, while in Haryana, Madhya Pradesh, Rajasthan and Orissa, they were only marginally higher. It means that in these States the crop loans were more than adequate to finance the purchase of fertilizers by all farmers, leaving some surplus for other inputs. In Uttar Pradesh and Punjab, on the other hand, the total short term loans formed only about one-third or half of the total cost of fertilizers alone consumed in these States. The situation was similar in Andhra Pradesh, Bihar, West Bengal and Gujarat, though the total values involved were much less. This suggests that in States like Punjab, Uttar Pradesh and the others, farmers either wholly or partly financed their purchase of fertilizers from their own resources or with the help of non-institutional credit agencies. These are States where the irrigated farmers

have recorded substantial growth in agricultural production. In the relatively weaker States also, the data suggest that farmers depend partly or wholly on own funds or other sources of credit to finance purchase of most inputs.

It would be useful to know if there is any difference in this matter amongst farmers in different size groups of land holding. Data relating to the cooperative societies published by NABARD show that while the larger size cultivator-borrowers borrowed more than the smaller ones in all States, this was not the case with crop loans per hectare of land under cultivation with the borrowers (Tables 6-7). Indeed, the smallest sized farms had the highest crop loan per hectare, the amount becoming smaller as the size of holding increased. This is possible if the crop area for which the larger farmers borrow does not grow in proportion to their total land holding. This in turn can happen if the larger sized farmers have a proportionately much smaller irrigated area than the smaller ones. But in States like Punjab where 90 per cent of the cropped land is irrigated, such a phenomenon can only lead to one conclusion: that the large farmers depend to a much greater extent on their own resources (or other credit agencies) for meeting current farm expenses than the smaller farmers do. This also appears to be the case with short term loans from the

commercial banks, which, starting from scratch, today account for 30 per cent of the total short term loans to agriculture (Table 8).

There is enough evidence, therefore, to conclude that amongst the borrowers from credit institutions, the larger the farmer the greater is his dependence on sources other than credit institutions for financing his current farming requirements. This does not, however, mean that most smaller farmers have received due amounts as cash loans from financial institutions.

Data published by NABARD and the Reserve Bank of India show that in case of the PACS the percentage of members in the smallest size-class of agricultural land holdings availing short term loans was not much smaller than the percentages in case of members in higher size-classes in most States, except States like Bihar and Kerala (Table 9). The real discrimination appears in the membership of small farmers as against the others. Taking the country as a whole, hardly 30 per cent of the smallest size cultivators were members of PACS, whereas this proportion was 75 to 100 per cent in case of the rest (Table 10). Therefore, hardly 10 per cent of the smallest farmers in the country received short term loans from the cooperatives in any year. This was also broadly the situation in the different

States of the Union. Indeed, there is a suspicion that even this 10 per cent is somewhat inflated; for, in the cooperative membership many land-holders really belonging to large farmer households feature as small owners for a variety of reasons and therefore avail of loans as small farmers. If the data about these can be excluded, the real small ones being members and availing of loan finance will turn out to be an even smaller proportion.

The commercial banks appear to have served the smallest farmers to a comparatively greater extent than the cooperatives (Table 11). More than 50 per cent of their borrowers of short term agricultural loans during a year are farmers in the smallest size-class (less than 1 hectare). But the important thing to note is that the total number of borrowers of crop loans during a year from the commercial banks constitute just about one-eighth of the borrowers from the cooperatives (Table 12). Therefore, the commercial banks are also not able to help the smallest farmers or even the others in a very significant way in regard to crop loans. Similar data are not available for the Regional Rural Banks which are meant exclusively for small farmers; but these banks account for a very small part of total crop loans.

This review of short term credit to agriculture shows that the financial institutions were meeting the needs of the cultivators for purchase of current inputs to a lesser extent in the Sixth Plan period. While the larger farmers have become dependent on their own and other sources to a greater extent, the smaller farmers are very largely outside the cooperative set up. The commercial banks have not been able to help them in any very significant measure either.

Before we turn to discuss the problems associated with the credit institutions, it would be useful to briefly review the problem of medium and long term credit in agriculture. It was noted in the previous issue that loans from financial institutions have come to occupy the major share of the total fixed capital formation in the private sector in agriculture [Rath, 1989, Pp. 64-83]. This is contrary to the tendency in regard to short term loans where the PACS still account for 67 per cent of all short term credit to agriculture. Beginning from scratch in 1969, the commercial banks had come almost to the level of the co-operatives (mainly the Land Development Banks) by 1973-74, the first year for which detailed data about the commercial banks are available. Between 1973-74 and 1984-85 both institutions continued to advance term

loans, with ups and downs, though the commercial bank loans grew somewhat faster (Table 13).

The cultivators receiving term loans for agriculture and allied purposes during a year from these two types of financial institutions constituted only about 1.25 per cent of all cultivating households in the country, each accounting for roughly half the total (Tables 14-16). In fact, the average term loan per borrower in case of the commercial banks is anything between 30 to 50 per cent higher than the average per borrower from the Land Development Banks. Moreover, about 20 per cent of all land holding borrowers from commercial banks cultivate more than 4, hectares of land but account for half of the total loans. On the other hand, some of the small land owner-borrowers are Integrated Rural Development Programme (IRDP) beneficiaries who are mainly served by commercial banks who serve the medium and large farmers to a greater extent than the LDBs, in matter of direct agricultural loans (Tables 17-18).

The Regional Rural Banks (RRBs) essentially lend to small farmers. They account for a small part, about 7 per cent, of total term loans; but the available data do not permit any detailed analysis.

The multiple credit agency system that has emerged in rural India does not appear to have followed any particular scheme or design, unless it is contended that the basic design was creation of competitive credit agencies for agriculture in rural India. However, that would be in the nature of *post-facto* rationalisation, rather than the result of clear thinking right from the beginning. When the commercial banks were nationalised, one of the goals was not creation of a competing credit agency in rural areas. It was rather to ensure more equitable distribution of resources amongst various regions and groups, by properly supplementing available resources in the co-operative credit system. The Fourth Five Year Plan said: "1.55 The nationalisation of banks is expected to help progress in the direction of socio-economic democracy. It can do so by ensuring that the availability of credit for various types of small producers and other business units is adequate and on reasonable terms. This will require not so much the diverting of large resources for the purpose as the creation of appropriate institutions, spreading them through all areas and evolving suitable procedures" [Planning Commission, 1970, Pp. 24-25]. For regions where the co-operative sector had failed to take proper roots, the Commission approvingly noted that the Government

had found it necessary to take powers to set up new agricultural credit corporations.

These corporations, advocated since 1945, however, did not come up. Instead, there was considerable debate on what should be the role of the nationalised commercial banks *vis-a-vis* the co-operative financial institutions in the field of rural credit. While no clear cut policy directives emerged, there was great pressure by the Government on these banks to extend to rural areas particularly in regions underdeveloped in credit institutions. There was no clear cut directive about the type of farmers these banks should serve; but when occasion arose they were asked to serve the small and marginal farmers as well.

By 1974, it was discovered that these commercial banks were proving very expensive institutions for rural credit, particularly for the small and marginal farmers. Hence, a new institution, the Regional Rural Bank, was created, as an understudy of a particular commercial bank, to meet the needs of the disadvantaged sections in rural society, at a lower cost. It was also said that these shall be located mainly in districts which were poorly served by cooperative credit institutions. In practice, these RRBs have now covered the bulk of the districts in the country. The result is, most districts

have three types of banks (and more than one commercial bank), and some at least two types.

Despite this, there appears to have been no improvement in supply of credit in traditionally underdeveloped agricultural regions. It was noted earlier that the six eastern and central Indian States have continued to receive a much smaller and unchanging share of both crop and term loans than their share in cropped land.

The commercial banks and the RRBs have not improved the position at all. Three-fourths of the total crop loans by the commercial banks are in the four southern States of Andhra Pradesh, Tamil Nadu, Karnataka and Kerala, with Andhra Pradesh taking the lion's share (more than 30 per cent) (Table 4). If we add three more States, also developed in matter of cooperative institutions like these four, namely Maharashtra, Gujarat and Punjab, that accounts for nearly 90 per cent of the total short term credit by the commercial banks. The under-developed States have an even poorer share than from the cooperative institutions.

The situation is only marginally better in case of the Regional Rural Banks. The four southern States account for nearly 70 per cent of the total crop loans extended by the RRBs. However, the four eastern and central States of Orissa, West Bengal,

Bihar and Madhya Pradesh take 15 to 20 per cent of the total crop loans by the RRBs. But one must remember that crop loans by RRBs do not amount to more than 4 per cent of the total short term credit to agriculture. Therefore, the eastern region's position has not improved significantly. In regard to term loans, the RRBs have exhibited the same pattern, though Orissa has an unusually large share in it. But, again the RRBs account for only about 7 per cent of total term loans.

The commercial banks have not exhibited a significantly different regional distribution in regard to term loans than the LDBs and cooperatives, except that its concentration is somewhat greater in the four southern States.

Therefore, if there was any expectation that these new credit institutions would change the very unequal regional distribution of credit, it has been completely belied; if anything, it has become worse. Nor has there been a movement of credit in favour of the smaller farmers.

It has sometimes been contended in discussions that the commercial banks had to be pressed into the field of rural credit because by the early years of the Fourth Plan the cooperative credit lines had been choked with overdues, and there appeared little chance of the cooperatives

reviving. I have not come across a serious statement to this effect in any authoritative document. But if there is any truth in this, it has proved to be basically a wrong line of thinking. The Fourth Five Year Plan had of course expressed concern at the extent of heavy overdues with the primary societies and the Central Cooperative Banks on the eve of the plan. However, the situation had become much worse by the end of the Sixth Plan. The overdues, as a percentage of outstanding loans of the primary credit societies had increased from around 32 to 48. But what about the commercial banks and the RRBs? The proper way of estimating overdues is to express the unrepaid part of the scheduled repayment demanded by the end of the year as a percentage of the latter (Tables 1-19). During the period 1979-80 to 1984-85, the overdues of short term loans of the commercial banks as percentages of demand varied between 40 and 47 per cent; for primary societies, it was about the same. In regard to long term loans, the overdues situation of the commercial banks was worse; it varied between 50 and 55 per cent, whereas for the LDBs it varied, during the same period, between 40 and 50 per cent. The RRBs are in no better position; their overall overdues to demand was of the order of 49 per cent during 1982-84. With such high overdues position at the all-India level, it is not surprising that in many States the percentage was higher

than 60. In fact, the overdues situation of the commercial banks in regard to term loans to agriculture would be seen to be worse, if the IRDP account could be separated. Thanks to immediate repayment of some 25 to 30 per cent of the loan by the Government, the overall repayment of

IRDP loans is much better than for other term loans; this would make the situation with regard to other agricultural loans of commercial banks somewhat worse. It is clear that if overdues were thought to be a particular malady of cooperative credit institutions, that impression has been proved to be wrong. All rural credit institutions are in the same boat. Obviously, the reason or reasons for overdues have little to do with the basic character of the credit organisation. Thinking in terms of institutional types in this matter has resulted in neglect of the basic issues affecting rural credit, until a decade and half later all are caught in the same trap.

The suspicion about the character and ability of the cooperative institutions has led to their neglect, which led to a weakening of the role of the cooperatives, leading in turn to greater lack of interest in them. The situation today is such that in any discussion of rural credit in the policy making and coordinating bodies,

the first reference by most is to the commercial banks. The reference to cooperatives is like to those who also ran.

An example of this relative neglect of cooperative institutions is the credit organisation for IRDP. Data show that 80 percent of the total credit disbursement to IRDP beneficiaries was by the commercial banks (including the RRBs). Now, these beneficiaries belong to the lowest economic strata in rural society. One would naturally expect the PACS in the villages to be the most appropriate agency for identification of these beneficiaries, assessment of their needs and potentialities, and disbursement of the loans. The commercial banks with, at most, a branch in a block, and with very limited staff and familiarity with the village scene and people, would appear the least qualified to do the job. A special enquiry by NABARD into this failure of the PACS in regard to IRDP loans showed that some of the provisions in the laws and by-laws governing the cooperative institutions were primarily responsible for this. In earlier times, these laws and by-laws would have been expeditiously amended to meet the needs of the situation. But, no one has bothered, because the commercial banks can be asked to do the job. Indeed, at the governmental level there is today a greater dependence on the commercial banks, wholly owned by and therefore under the

direct control of the government, rather than on the cooperatives, which, all said and done, are independent business organisations!

A more serious sign of neglect is the lack of any detailed appreciation of and control over the working of the crop loan system at the ground level. Three decades ago this was a major innovation in the Indian agricultural credit field, freeing the cultivator from relating his production credit to his fixed assets, and instead relating it to his expected output. This was absolutely necessary and useful to a growth oriented agricultural economy. It was the responsibility of a technical committee of the DCCB to prepare an estimate of the loan per acre of different crops, under irrigated and unirrigated conditions separately, after estimating the out-of-pocket expenses that would be required under prevailing cultural practices. The secretary of the village society, thereupon, was to ascertain from each member, the area he proposed to put under different crops during the year and calculate his total credit limit accordingly. Indeed, the loan was to be disbursed as per requirements during the year, and recovery had to be made after marketing. But it is not clear that this is how the system is actually operating; otherwise, how come that the total crop loan disbursement does not come even upto the total expense on fertilizers on

farms? Surely, the ineligible farmers and/or societies with overdues cannot entirely account for this! There is also reason to suspect that many borrower members really belonging to large farm households are featuring as small farmers, partly because they have as much land in their names (as share in family property), and partly because if a middle or large farmer chooses to take crop loan for only a few acres, he is listed among the small. Data for some States show that the shares of farmers of all sizes in the total crop loans from cooperatives are about the same, with the small receiving much larger loans per hectare than the larger farmers. One does not know to what extent this feature is ensured by suitable operation of the method to meet NABARD stipulations about a minimum share of total loans to small farmers. Nor does one know why some farmers do not borrow from the society: because of overdues, or no need, or excluded by the society as a deliberate act, or negligence? There have been complaints about disbursement of loans for *Kharif* or *Rabi* crops too late in the season. And, repayment is closely tied to a single date, end of June, irrespective of anything else. These have, unfortunately, not attracted the serious attention they deserve. It is only now that NABARD is conducting a small scale enquiry in depth into these questions. If cooperatives had not lost



their status, I cannot imagine that all these would not have been carefully ascertained and corrective steps taken.

In point of fact, in an agricultural economy like ours, with millions of small and not so small farmers spread over thousands of villages, it is difficult to visualise a commercial banking system of the present type with a branch in a Block, being able to operate a supervised credit system effectively. It can do so for the small number of large farms, which is what the commercial banks appear to be doing to a large extent. It is best to demarcate the field and confine their activities to such farmers. The rest should be taken care of by the cooperatives where they are well organised, and by the RRBs in other areas.

The commercial banks are high cost institutions, particularly for rural credit. In their existing pattern of staffing, transfer and promotions, they are unlikely to develop a cadre of specialised agricultural bank officers with good knowledge of local agricultural features and problems. If confined to a limited number of large farmers, these difficulties and costs can be effectively minimised. The commercial banks can and should, in addition, channel a part of their funds, particularly the deposits from their

limited rural branches, to cooperatives and/or RRBs to supplement their resources for rural lending.

The cooperative credit institutions need strengthening in a number of ways in order to discharge their responsibilities satisfactorily. A major characteristic of our cooperative credit structure, particularly at the primary level, has been the heavy - in many places almost exclusive - dependence on outside funds, from Reserve Bank, now NABARD, and the Government, as loanable funds. If the members have no stake in the loanable funds, it is easy to be lax in regard to their use and recovery. When the expanded crop loan and term loan system got going, the village society was not in a position to mobilise cash savings from the members to any significant extent. The district and state level banks depended on governmental and urban deposits to a much larger extent. This ground level situation has gradually changed in some areas, like in Kerala. But the cooperative banks have not been the recipients of growing bank deposits from rural sectors for a variety of reasons.

A recent committee of NABARD notes in its report that one reason for this inadequate deposit mobilisation has been

the stiff competition from the commercial banks which can offer many advantages with their countrywide connections [NABARD, 1984].

A second reason for inadequate use of available deposits for agricultural lending is the high cost of these deposits as against the interest earned on agricultural lending. Since the interest rates on most agricultural loans are fixed by the Reserve Bank, the difference between the cost of deposits and the returns from such lendings are so small as to make it a tight rope walking. Consequently, the cooperatives use most of their deposits for lending for such indirect agricultural and related purposes where the interest rates can be higher. The result is, for most direct agricultural purposes, the cooperatives depend on funds provided by the refinancing agencies.<sup>3</sup> It would seem, the time has come when this can change.

There are several types of direct agricultural loans for which it is no longer necessary to charge concessional interest rates. Take the case of tractors and such other farm machinery. Once upon a time when the Indian farmer was unfamiliar with such equipment, and uncertain about its economic viability, there was justification in trying to help him bear the risk element by charging a lower rate of interest. But since then much water has flown down the bridge. Today a larger

part of the purchase of tractors is for replacement. Farmers have found tractors worthwhile and therefore go in for new ones, to save the growing maintenance costs on the old. Indeed, tractor services are also used significantly for consumption purposes, as many studies have shown, which is a sign of the better income position of the concerned farmers. There is no longer any economic justification for concessional interest to be charged for loans for the purpose. Indeed, charging the going market rate would hopefully lead to greater rationalisation in the use of such equipment.

Similarly, the case of pumpsets, and even sinking of wells and tubewells. In many areas, rural electrification has led to substitution of diesel pumpsets by electric ones which are cheaper in more ways than one, since in many States today the marginal cost of power for pumping water in agriculture is zero. Under such conditions, it is pointless to charge a concessional rate of interest for the loan. Indeed, a somewhat more expensive pumpset is sure to lead to rationalisation in both the choice of a pumpset and its fixation - matters which are widely noticed to be very carelessly and wastefully handled. If the State Governments and the electricity boards will not, at least the Reserve Bank and NABARD can instil some discipline in the matter.

Sinking of wells and tubewells have been acts of gambling by farmers in many regions. But in other regions it is not so. Even where uncertainties exist, if a well strikes a source of adequate water supply, it is a paying investment. It is only when wells yield inadequate or no water that the questions of rescheduling of repayment, lowering the interest rate and of writing off the principal arise. Therefore, it is not necessary to charge concessional rates of interest for all loans for wells and tubewells. The rates of interest could be reduced when the wells are found to be poor yielding; otherwise the prevailing market rates by the financing institutions should be charged. A better alternative would be insurance against failure of a well.

This, in effect, means that the more successful wells will partly finance the cost for the less successful ones. Indeed, writing off the loan in case of a failed well should not depend upon the State Government's willingness and convenience as is the situation at present. This should be decided by the financing institutions. A fund for this purpose may be created with contributions from NABARD as well as the Banks and the State Government; and the apex financial institution should administer it.

All this need not be interpreted to mean that loans for such purposes should be freed from the list of priority sector lending. Indeed, lending to agriculture as a priority sector, in these matters, should be enforced by stipulating a particular share of total bank advances for the purpose. That need not necessarily mean concessional interest rates.

If this policy is followed, the cooperative credit institutions will have less justification in diverting their deposits to indirect agricultural lending and other purposes. Moreover, with the deposit money of the cooperatives used to finance capital projects of members, the members of the cooperatives are likely to take greater interest in such lending operations and keep a supervising eye on their utilization. The land development banks would, in that event, find it possible and useful to have local level committees of members to help in the approval and supervision of such loans. The PACS will also find their local committees sit up and take active interest in administration of medium term loans. The vast experience of the PACS in Kerala during the last decade or so, when more than half their loanable funds have been the deposits with them, is sure to be instructive in this regard.

The crop loan system needs careful review and improvement, in view of the feeling that it has slid down due to neglect. A proper implementation of the crop loan system would result in timely supply of credit to farmers, thereby avoiding considerable hardship and high cost. By-laws and practice regarding requirement of security and surety, particularly from tenants and small farmers whose names appear on the village revenue records as such, need to be changed. A proper implementation of crop loans can also help in defining a small farmer, who is expected to be given a fairer deal, in terms of his income rather than the size of land holding by which NABARD defines him today. This will result in a common uniform definition of small farmers for purposes of both short and long term credit, which at present is absent. In fact, it may be useful to use the PACS as agents of LDBs at the village level for disbursement of term loans and their supervision, thereby bringing about an effective coordination in the working of the two types of cooperative credit institutions. It, in turn, will help improve the financial situation of the PACS, many of which today have only a part-time secretary.

The problem of overdues is a mounting problem. There are many reasons for it. Bad weather and poor crops is one. Rescheduling in such cases, and writing

off of interest for the small farmer has to be expeditiously done, so that these do not appear as overdues, blocking the farmer's line of fresh credit. Crop loan insurance, currently under operation in many States for some crops, is sure to prove useful in this regard. Both these are not working properly because Government decision in one case and the subsidy contribution in the other do not come in time. It would be preferable for Government to make its subsidy contribution available to the Insurance Company in advance as deposit so that delays are avoided.

As indicated earlier, credit is a continuous operation, where repayment does not have to be total on a date facilitate fresh borrowing. But this is what has been practised in the cooperative credit field. Writing more than two decades ago, D.R. Gadgil, an outstanding thinker and leader in the field of cooperation, who was closely associated with the evolution of the crop loan system, said:

"The point that needs consideration in connection with current overdues is the concept of complete repayment at a point of time with reference to which overdues are defined. It was no doubt necessary in the earlier stages of the development of the cooperative movement to guarantee that at an time in the year the cultivator worked off his loan completely. It is

proper also that the practice of fictitious repayments and early renewal is discouraged. However, when the cooperative becomes the only source of finance for a farm family and when the total loan operations become large, the question may be raised as to whether it is proper to expect that an account will be completely cleared at one particular point in the year. It is necessary in this context to look realistically at receipts and expenditure flowing in the economy of the individual cultivator. If during the production season the borrowings and the production outlay of the cultivator are increasing, at the end of the production season he has not only the repayment but the accumulated consumption expenditure needs to met.... it would then happen that at no time in the year would his account ever be brought to zero. The banking account of a company with continuous production operations is never expected to be fully repaid at any one point of time. A good banker watches the accounts to see that they are active in an appropriate manner and that in the slack season, if there is one, outstandings are brought down fairly low. There is, however, no insistence on complete clearing of debts in the renewable limits. When Progress is made in the direction of giving full credit and covering consumption needs together with production needs, a revised view of definition of overdues may have to be taken. The

present formula of complete repayment leads to the need of artificial adjustments in many cases and, therefore, a more satisfactory index the behaviour of accounts may have to be established. This again is something which indicates the need for a greater elaboration of administration of credit in the direction of supervised individual credit" [Gadgil, 1975].

If the real overdues position were as it usually gets reported at the end of June, the situation would have been impossible by now. People do repay, at unavoidably different rhythms. Technical overdues only complicate matters by creating artificial barriers. It is sad that in thirty years we have not made any progress in this direction. With the primaries looking up, this improvement can be a real possibility.

In addition to all these, there is the problem of the relationship of the cooperative credit institutions with the Government. The cooperative is a business organisation, working within the overall socio-economic frame of country and in that sense responsive to its goals. While due to initial shortage of funds and administrative experience, the State had to come to the help of the cooperatives in a big way, today the State appears to be far too much in control, thereby making it almost impossible for cooperators to

learn by doing. Political interference, through the Government's supervisory agency - the registrar's office - for reasons other than the health of the organisation, has become more and more visible. Administration of banks is taken over by State Governments without reference to and consent of the Reserve Bank/NABARD. As a special custodian of the cooperative credit institutions, the Reserve Bank and its agent, NABARD, should be entrusted with this responsibility of deciding on the take over of any cooperative bank. If the shareholding by the State Government in these banks creates any problems in this matter, it may be desirable for NABARD/RBI to take up these State shares. Banks must function as banks, and be helped to do so.

Another type of political interference with cooperative as well as other credit institutions in India in recent years is the announcement by the State of writing off of massive sums of rural credit. This has become a growing malady affecting many different political parties in power. Apart from the strain it puts on the State's exchequer, with all its consequences, the step destroys the trust of the average cultivator in his basic values in regard to credit; those that have repaid before the write off feel cheated, and the impression gets round that if you hold back, one day it will be written off by the State. Nothing can do greater harm to credit institutions

than such acts of populism by the Government. The State instead of indulging in such vandalism, should strengthen the hands of the credit agencies to pursue various other measures, some of which were mentioned above, by making appropriate financial contribution to the funds.

This brings me to the question of leadership of the cooperative institutions. These are business organisations functioning on democratic lines. As in any democratic institution, leadership is very important to its success. Building up the institutions and the leadership with it, is a time consuming process. The important thing here, as in any other type of institution, is to have sustained interest in and loyalty to the cause. In a democratic pluralistic society different institutions in different fields must play their respective roles. Unfortunately, beginning with the right attitude and approach, our cooperative movement seems to have lost track somewhere. Today, too many cooperative institutions are being used by their leaders, past and present, for promotion of their political goals. In the interest of both types of organisations, it is necessary to keep the two separate, functioning in their respective fields. Therefore, it is necessary that no elected member/office bearer of a cooperative institution should be at the same time a member of any elected political body like

the Parliament, Assembly, Zilla Parishad, etc. Indeed, it would be desirable that any office bearer of a cooperative wishing to contest election to any such political body should first resign from his position in the cooperative so that he does not use the cooperative for the purpose and in the process compromise its character and interest. It is absolutely necessary to observe such discipline if cooperative leadership is to be nurtured in our rural society. Many today regret the passing away of the older generation of dedicated cooperators; a time should come when the new ones would feel they are the true inheritors of the tradition of cooperation.

The Regional Rural Banks should be allowed to be the dominant institution in areas where cooperatives have not come up or are in a poor way. The Fourth Five Year Plan visualised the Agricultural Finance Corporations (which were to be set up in such regions) essentially as transitory arrangements. Ultimately, these were to transform and mature into cooperative institutions. I think the RRBs should serve a similar purpose in the long run. Its institutional structure at the ground level should associate borrower-members in small committees to advise and keep a supervising eye on loan operations. These bodies, properly

structured, might provide the training ground for future leadership in the cooperative transform.

The trouble with the cooperatively underdeveloped regions, particularly in eastern India, is not only a lack of tradition in this field, largely as a result of the intermediary tenure system in land, but a lack of interest in the problem of agriculture and agricultural development in the middle and upper classes that provide the political leadership in these regions. Their most serious attention is concentrated on industrial development which they see as the best way of ensuring good salaried jobs. A leadership with interest in agriculture and its problems has to be created in such unhelpful social environment. The RRBs can and should make their modest contribution in this direction.

Finally, we should remind ourselves that a large body of our cultivators consists of small and marginal farmers, and their tribe is going to increase in the foreseeable future. The credit structure cannot afford to ignore their interest. Concessional interest rates on loans to small farmers identified on the basis of total household income rather than individual land holdings, would help some of them. In their case an integrated credit system, with investment, production and consumption loans, also will have to be

worked out in which the loan repayment operation will have to be a continuous process, on the lines indicated in the quotation from Prof. Gadgil's writing above. This will need greater supervised credit than what is practised today. The primaries have to be strengthened to that end.

But when all is said and done, one must remember that every indigent small and marginal farmer simply cannot be helped by credit alone. Unless there is a production base which credit can help the farmer to exploit, credit alone can be frustrating and worse. And, banks cannot necessarily be expected to create this base or environment. There is a tendency in our country to expect every type of institution to do everything. While the anxiety and urgency behind this is laudable, it creates impossible situations for such institutions. The lead banks in different districts, for example, are expected to prepare credit plans. But a credit plan presupposes a general economic development plan for the district. Since such a thing does not exist for most districts, the lead banks are expected to somehow prepare an outline of a development plan, on the basis of which they can prepare a credit plan. The less said about such efforts, the better.

The numbers and problems of small farmers are going to become acute in the years to come. It will be unreasonable and harmful to expect the credit institutions to help most of them out. The State has to have a clear thinking about how they can be helped. Changed strategy, of agricultural investments in the public sector, to which reference was made earlier, would create the basis for the banks to help some of these small people. Other types of institutional organisations, like cooperative farms, will have to be developed for banks to help them. But finally not all of them may find it possible to stay in agriculture, and agricultural credit institutions cannot be the appropriate agencies for their purpose. This is obvious; but in our hurry we resort to adhocism that runs counter to this, and brings the institutions to grief in the process.

Rural credit is a growing field, crucial to agricultural development and to the development of democratic institutions in rural society so necessary for our social organisation and progress. The relative neglect of cooperative institutions and ad-hoc approaches seem to have reduced the flow of credit to agriculture compared to the needs. Unless corrective measures are taken early, the cooperatives would get choked and the alternative will be of high cost and ineffective. It is high time serious thought and attention are given to



these, if the growth of agriculture is to be sustained and improved in a better organised rural society.

#### FOOT NOTES

1. The annual compound rate of growth of about 2.7 per cent for total agricultural production during the 30 years since 1955 may be compared with a total 16 per cent growth over the first half of this century.

2. The tabulated data relating to this based on the Debt and Investment Survey in 1981-82 carried out by the N.S.S.O, on behalf of the Reserve Bank of India, are not yet available. But the percentage is very likely to be greater than it was in 1971.

3. Of course RBI/NABARD have stipulated at least a certain part of the own funds of SCBs and DCCBs to be used for directed lending to agriculture. But here is general resistance to it, and exemptions are frequently sought and granted.

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**Table 1. Total Short Term Loans to Agricultural and the Total Cost of Agricultural Inputs**

(Rs. Lakh)

Year	Value of all Material Inputs	Compensation to Employees	(2+3)	Cost of Five Inputs*	Total Short Term Loans	6 as Per cart of		
						2	4	5
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1973-74	631615	435721	1067336	94994	83843	13.3	7.9	88.4
1974-75	795999	457979	1253978	237445	92865	11.7	7.4	39.1
1975-76	783924	525679	1309603	259288	113083	14.4	8.6	43.6
1976-77	851753	566577	1418330	281792	131629	15.5	9.3	46.7
1977-78	928610	727683	1656293	300790	139932	15.1	8.4	46.5
1978-79	976665	776741	1753406	338822	162696	16.7	9.3	48.0
1979-80	1168788	850259	2019047	390495	181216	15.5	9.0	46.4
1980-81	1469982	876155	2346137	552123	209984	14.3	9.0	38.0
1981-82	1755856	967118	2722974	743040	248996	14.2	9.1	33.5
1982-83	1878532	1007737	2886269	795688	257091	13.7	8.9	32.3
1983-84	2060037	1168982	3229019	856382	315013	15.3	9.8	36.8
1984-85	2194659	1228548	3423207	947386	349018	15.9	10.2	36.8

\*The five inputs are chemical fertilizers, irrigation charges, electricity, pesticides and insecticides, diesel oil.

Source: 1. Cols. (2), (3) & (5) from respective volumes of the *National Accounts Statistics*, Central Statistical Organisation, Government of India. 2. Col. (6) from NABARD. These include a small amount of loans for marketing and consumption to rural households.

**Table 2. Share of Primary Agricultural, Credit Societies, Banks and RRBs in the Total Short Term Loans Supplied to Agriculture and Allied Activities, 1973-85**

(Per cent)

States	Percentage Distribution of		1973-74		1974-75		1975-76		1976-77		1977-78		1978-79		1979-80	
	Gross cropped Area 1982-83	Gross Irrigated Area 1982-83	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
A. P.	7.4	8.7	47.0	53.0	49.2	50.8	61.0	39.0	58.9	41.1	49.4	50.6	50.7	49.3	46.3	53.7
Assam	2.1	1.1	64.5	35.5	80.3	19.7	-	100.0	54.3	45.7	61.3	38.7	66.9	33.1	77.8	22.2
Bihar	5.6	6.4	80.4	19.6	91.5	85	80.9	19.1	76.8	23.2	74.7	25.3	81.1	18.9	79.2	20.8
Gujarat	5.9	4.9	91.3	8.7	92.4	7.6	89.4	10.6	87.7	12.3	88.0	12.0	86.6	13.4	85.1	14.9
Haryana	3.1	6.8	95.3	4.7	94.4	5.6	95.9	4.1	97.2	2.8	96.0	4.0	96.8	3.2	92.3	7.7
H. P.	0.6	0.3	89.2	10.8	90.2	9.8	78.5	21.5	82.6	17.4	67.6	32.4	68.3	31.7	46.0	54.0
J. & K.	0.6	0.8	96.0	4.0	92.1	7.9	-	100.0	95.0	5.0	87.4	12.6	67.4	32.6	65.5	34.5
Karnataka	6.4	3.4	78.7	21.3	79.5	20.5	69.6	30.4	69.7	30.3	68.2	31.8	64.7	35.3	64.1	35.9
Kerala	1.6	0.7	80.5	19.5	70.7	29.3	61.4	38.6	63.8	36.2	69.0	31.0	71.9	28.1	74.7	25.3
M.P.	12.9	5.3	93.1	6.9	95.6	4.4	96.2	3.8	93.3	6.7	93.1	6.9	92.3	7.7	90.7	9.3
Maharashtra	11.6	5.2	85.3	14.7	87.6	12.4	90.0	10.0	91.2	8.8	89.9	10.1	88.3	11.7	86.2	13.8
Orissa	4.8	3.9	88.6	11.4	86.9	13.1	82.9	17.1	80.8	19.2	78.4	21.6	78.8	21.2	80.5	19.5
Punjab	4.0	11.8	97.8	22	97.7	2.3	96.2	3.8	91.2	8.8	87.0	13.0	84.3	15.7	85.9	14.1
Rajasthan	10.6	7.9	96.7	33	95.5	4.5	95.9	4.1	94.8	5.2	94.1	5.9	93.6	6.4	94.6	5.4
T. N.	3.5	5.2	65.3	34.7	72.3	27.7	67.6	32.4	73.2	26.8	72.1	27.9	60.1	39.9	39.5	60.5
U.P.	14.3	23.3	94.8	52	92.2	7.8	90.2	9.8	89.5	10.5	91.5	8.5	89.1	10.9	88.1	11.9
W.B.	4.0	3.5	79.1	20.9	85.5	14.5	80.7	19.3	92.2	7.8	76.5	23.5	74.9	25.1	75.8	24.2
Others	1.0	0.8	40.5	59.5	46.6	53.4	52.4	47.6	22.1	77.9	49.8	50.2	51.0	49.0	46.6	53.4
India	100.0	100.0	82.4	17.6	84.3	15.7	81.2	18.8	80.7	19.3	79.4	20.6	77.6	22.4	74.9	25.1

**Table 2. (Concl.)**

(Contd.)

States	1980-81			1981-82			1982-83			1983-84			1984-85		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
A. P.	48.9	45.6	5.5	41.8	53.1	5.1	41.3	47.6	11.1	24.9	67.0	8.1	29.6	60.4	10.0
Assam	58.7	13.9	27.4	28.9	42.8	28.3	57.2	27.4	15.4	56.6	32.6	10.8	67.7	26.7	5.6
Bihar	66.0	25.7	8.3	75.3	16.2	8.5	80.0	10.7	9.3	73.4	13.6	13.0	61.2	29.4	9.4
Gujarat	83.4	16.5	0.1	83.4	16.4	0.2	86.2	13.6	0.2	81.1	18.6	0.3	80.2	19.4	0.4
Haryana	93.3	6.6	0.1	94.4	5.6	neg.	97.2	2.8	neg.	96.4	3.6	neg.	94.7	5.2	0.1
H. P.	51.0	46.6	2.4	64.8	34.0	12	79.3	16.1	4.6	77.9	19.6	2.5	66.1	31.1	2.8
J. & K.	63.9	31.5	4.6	43.5	49.2	7.3	79.2	7.4	13.4	67.0	22.4	10.6	43.5	46.1	10.4
Karnataka	61.4	33.9	4.7	55.0	39.4	5.6	55.7	37.0	7.3	56.8	33.9	9.3	54.2	36.3	9.5
Kerala	71.4	22.8	5.8	72.6	22.5	4.9	70.5	24.5	5.0	69.9	26.7	3.4	71.9	23.6	4.5
M.P.	92.3	6.8	0.9	92.8	6.0	1.2	95.4	3.4	12	91.3	6.5	2.2	90.6	7.4	2.0
Maharashtra	87.9	12.0	0.1	83.3	16.6	0.1	91.4	8.5	0.1	86.1	13.6	0.3	83.0	16.3	0.7
Orissa	61.1	34.9	4.0	75.0	15.7	9.3	64.8	24.4	10.8	66.0	23.4	10.6	67.6	23.2	9.2
Punjab	82.9	17.1	-	79.3	20.7	-	83.7	16.3	-	85.7	14.3	neg.	82.3	17.6	0.1
Rajasthan	92.1	6.1	1.8	92.4	6.5	1.1	93.2	6.0	0.8	91.6	7.3	1.1	87.3	11.3	1.4
T. N.	27.3	67.2	5.5	48.0	48.1	3.9	45.5	50.2	4.3	43.3	52.7	4.0	33.6	66.4	-
U.P.	80.9	17.5	1.6	83.4	14.2	2.4	87.5	9.8	2.7	85.7	11.4	2.9	79.8	15.6	4.6
W.B.	65.3	29.7	5.0	70.5	23.0	6.5	64.0	24.5	11.5	78.7	13.9	7.4	82.2	14.8	3.0
Others	48.2	47.5	4.3	32.4	61.0	6.6	38.1	55.3	6.6	21.0	76.0	3.0	30.4	69.5	0.1
India	72.7	24.6	2.7	72.1	25.0	2.9	74.2	22.0	3.8	68.5	27.7	3.8	66.6	29.6	3.8

Note: Col(1): PACS; Col(2): Commercial Banks including RRBs till 1979-80, and separated thereafter; Col(3): from 1980-81 onwards RRBs. neg: negligible

Sources: (1) Data from the Reserve Bank of India and NABARD, obtained through the good offices of NABARD. (2) Indian Agriculture in Brief, 21st Edition, Ministry of Agriculture. Government of India.

**Table 3. Total Overdue and Annual Disbursement by (A) All Financial Institutions, i.e., PACS, CBS AND RRBS, and (B) Only PACS, as Percentage of the Total Cost of Five Purchased Inputs in Agriculture**  
(Rs. Lakh)

Year	Overdues	Total Disbursement	(2+3)	Cost of Five Inputs in Agriculture	4 as Per cent of 5
(1)	(2)	(3)	(4)	(5)	(6)
(A) ALL FINANCIAL INSTITUTIONS					
1980-81	165702	209984	375686	552123	68.0
1981-82	150481	248996	399477	743040	53.8
1982-83	159009	257091	416100	795688	52.3
1983-84	192733	315013	507746	856382	59.3
1984-85	235689	349018	584707	947386	61.7
(B) ONLY PRIMARY AGRICULTURAL COOPERATIVE SOCIETIES					
1973-74	36819	69052	105871	94994	111.5
1974-75	49850	78259	128109	237445	54.0
1975-76	57595	91828	149423	259288	57.6
1976-77	65386	106244	171630	281792	60.9
1977-78	82718	111122	193840	300790	64.4
1978-79	97901	126191	224092	338822	66.1
1979-80	111932	135765	247697	390495	63.4
1980-81	136063	152632	288695	552123	52.3
1981-82	109911	179585	289496	743040	39.0
1982-83	121190	190814	312004	795688	39.2
1983-84	130851	215785	346636	856382	40.5
1984-85	157265	232365	389630	947386	41.1

Note: The overdue figures for commercial banks relate to short term loans only, while those for PACS and RRBs to medium and short term loans. The data relating to overdues of RRBs are available for only two years, 1983-84 and 1984-85.

Source: Cols. (2) and (3): are from NABARD, Col. (5) from Table 1 above.

Table 4. Short Term Loans to Agriculture Allied Activities Provided by PACS and RRBS, 1973-85

States	1973-74			1974-75			1975-76			1976-77			1977-78			1978-79			1979-80		
	PACS (1)	CB (2)	Total (3)	PACS (1)	CB (2)	Total (3)	PACS (1)	CB (2)	Total (3)	PACS (1)	CB (2)	Total (3)	PACS (1)	CB (2)	Total (3)	PACS (1)	CB (2)	Total (3)	PACS (1)	CB (2)	Total (3)
A. P.	4.3	22.8	7.6	3.8	21.1	6.5	7.5	20.8	10.0	7.5	22.0	10.3	6.2	24.5	10.0	6.7	22.5	10.3	7.0	24.2	11.3
Assam	0.2	0.4	0.2	0.2	0.2	0.2	-	0.1	neg.	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bihar	1.8	2.1	1.9	1.6	0.8	1.5	2.0	2.0	2.0	1.7	2.1	1.8	1.6	2.1	1.7	1.7	1.3	1.6	1.5	1.2	1.4
Gujarat	15.4	6.8	13.9	14.4	6.4	13.2	11.7	6.0	10.6	9.6	5.6	8.8	9.6	5.1	8.6	10.1	5.4	9.0	10.2	5.3	9.0
Haryana	4.1	0.9	3.5	4.4	1.4	4.0	4.5	0.8	3.8	6.2	0.7	5.2	6.2	1.0	5.2	7.3	0.9	5.8	5.9	1.5	4.8
H. P.	0.4	0.2	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.3	0.1	0.3	0.2	0.1	0.5	0.2
J. & K.	0.3	0.1	0.3	0.1	0.1	0.1	-	0.1	neg.	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.4	0.3
Karnataka	6.5	8.2	6.8	7.5	10.4	8.0	7.9	14.8	9.2	6.3	11.5	7.3	6.1	10.9	7.1	5.7	10.7	6.8	6.0	10.0	7.0
Kerala	5.2	5.9	5.3	4.8	10.6	5.7	4.3	11.8	5.7	4.9	11.8	6.3	5.9	10.1	6.7	8.1	11.0	8.8	9.5	9.6	9.6
M.P.	7.3	2.5	6.5	7.2	1.8	6.4	7.3	1.2	6.1	5.8	1.7	5.0	5.4	1.5	4.6	6.2	1.8	5.3	5.9	1.8	4.9
Maharashtra	18.2	14.6	17.6	17.0	12.9	16.3	15.0	7.2	13.6	15.1	6.1	13.3	13.2	5.7	11.6	11.0	5.0	9.6	12.2	5.8	10.6
Orissa	1.7	1.1	1.6	1.8	1.5	1.8	1.8	1.6	1.8	2.0	2.0	2.0	2.2	2.3	2.2	2.5	2.3	2.5	3.0	2.2	2.8
Punjab	8.3	0.9	7.0	9.7	1.2	8.3	7.9	1.3	6.7	7.0	2.8	6.2	7.8	4.5	7.1	9.6	6.2	8.8	14.5	7.1	12.7
Rajasthan	3.4	0.6	2.9	4.2	1.0	3.7	6.4	1.2	5.4	5.3	1.2	4.5	4.9	1.2	4.1	5.1	1.2	4.2	5.1	0.9	4.0
T. N.	10.5	26.2	13.3	10.9	22.3	12.6	10.9	22.6	13.1	12.9	19.9	14.3	12.9	19.2	14.2	8.7	20.0	11.2	4.7	21.2	8.8
U.P.	10.0	2.5	8.7	9.1	4.1	8.3	9.9	4.7	8.9	11.7	5.8	10.5	12.8	4.6	11.2	12.5	5.3	10.9	10.9	4.4	9.2
W.B.	2.1	2.5	2.1	2.6	2.4	2.6	2.3	2.3	2.3	3.1	1.1	2.7	4.4	5.3	4.6	4.1	4.7	4.2	2.8	2.7	2.8
Others	0.3	1.7	0.5	0.3	1.6	0.5	0.3	1.2	0.5	0.4	5.1	1.3	0.3	1.3	0.5	0.3	1.0	0.5	0.4	1.1	0.5
India	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Loans*	690.52	147.91	838.43	782.59	146.06	928.65	918.28	212.55	1130.83	1062.44	253.85	1316.29	1111.22	288.10	1399.32	1261.91	365.05	1626.96	1357.65	454.51	1812.16

(Contd.)

Table 4. (Concltd.)

States	1980-81				1981-82				1982-83				1983-84				1984-85			
	PACS (1)	CB (2)	RRB (3)	Total (4)	PACS (1)	CB (2)	RRB (3)	Total (4)	PACS (1)	CB (2)	RRB (3)	Total (4)	PACS (1)	CB (2)	RRB (3)	Total (4)	PACS (1)	CB (2)	RRB (3)	Total (4)
A. P.	6.6	18.2	20.2	9.8	5.8	21.3	17.8	10.1	5.5	21.6	29.1	10.0	5.1	34.0	29.9	14.1	6.3	29.1	38.1	14.3
Assam	0.1	0.1	1.1	0.1	neg.	0.1	0.8	0.1	0.1	0.1	0.3	0.1	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.1
Bihar	0.9	1.1	3.2	1.1	1.4	0.9	4.0	1.3	1.4	0.6	3.2	1.3	0.9	0.4	3.0	0.9	1.2	1.2	3.1	1.2
Gujarat	7.9	4.6	0.3	6.9	7.4	4.2	0.6	6.4	6.9	3.7	0.3	5.9	6.9	3.9	0.5	5.8	7.7	4.2	0.6	6.4
Haryana	7.7	1.6	0.1	6.0	8.0	1.4	0.1	6.1	8.9	0.9	0.1	6.8	7.7	0.7	0.1	5.5	7.4	0.9	0.1	5.2
H. P.	0.2	0.4	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2
J. & K.	0.2	0.3	0.4	0.2	0.2	0.5	0.7	0.3	0.2	0.1	0.5	0.2	0.1	0.1	0.4	0.1	0.1	0.2	0.4	0.2
Karnataka	6.0	9.9	12.6	7.2	6.1	12.5	15.6	7.9	5.5	12.4	14.2	7.4	6.6	9.7	19.5	8.0	6.0	9.1	18.7	7.4
Kerala	11.0	10.4	24.2	11.2	10.1	9.0	17.1	10.0	10.7	12.6	14.8	11.3	10.5	9.9	9.3	10.2	13.3	9.8	14.5	12.3
M.P.	7.6	1.6	1.9	6.0	7.5	1.4	2.4	5.8	7.1	0.8	1.7	5.5	6.3	1.1	2.7	4.7	7.2	1.3	2.8	5.3
Maharashtra	14.2	5.7	0.2	11.8	14.2	8.2	0.5	12.3	16.2	5.1	0.3	13.1	13.7	5.4	0.7	10.9	12.6	5.5	1.9	10.1
Orissa	3.6	6.2	6.3	4.3	3.3	2.0	10.3	3.2	3.0	3.9	9.9	3.5	3.3	2.9	9.4	3.4	2.5	2.0	6.1	2.5
Punjab	12.9	7.8	-	11.2	10.9	8.2	-	9.9	10.2	6.7	-	9.1	13.2	5.5	0.0	10.6	12.4	6.0	0.2	10.0
Rajasthan	4.8	0.9	2.5	3.8	5.3	1.1	1.6	4.1	5.3	1.1	0.9	4.2	5.1	1.0	1.1	3.8	4.5	1.3	1.2	3.4
T. N.	2.8	20.0	15.1	7.3	7.2	20.8	14.7	10.8	6.1	22.7	11.3	9.9	6.1	18.5	10.1	9.7	5.0	22.3	-	10.0
U.P.	10.7	6.8	5.7	9.6	10.0	4.9	7.3	8.6	10.8	4.1	6.5	9.2	10.5	3.5	6.58	8.4	9.7	4.2	9.7	8.0
W.B.	2.5	3.4	5.2	2.8	2.3	2.2	5.4	2.4	1.7	2.2	5.9	2.0	3.5	1.5	5.8	3.0	3.6	1.5	2.4	2.9
Others	0.3	1.0	0.8	0.5	0.2	1.1	1.0	0.4	0.3	1.3	0.9	0.5	0.2	1.6	0.5	0.6	0.2	1.1	0.0	0.5
India	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Loans*	1526.32	517.02	56.50	2099.84	1795.85	623.07	71.04	2489.96	1908.14	564.83	97.94	2570.91	2157.85	872.46	119.82	3150.13	232.65	1034.86	131.67	3790.18

neg: negligible; \* Rs. Crore  
Source: Supplied by NABARD.

Table 5. Consumption of Chemical Fertilisers and Total Crop Loans by All Financial Institutions, 1973-85.

States	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85												
	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)												
A. P.	9.9	11.2	11.9	6.8	14.2	10.1	11.8	9.7	12.2	9.3	11.8	10.2	11.8	10.4	8.6	10.8	7.7	11.4	7.9	11.8	13.0	11.9	11.0	
Assam	0.3	0.3	0.3	0.2	0.2	neg.	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	
Bihar	3.4	2.7	4.5	1.5	4.7	2.0	4.6	1.7	4.0	1.6	3.8	1.6	3.5	1.5	3.7	1.0	3.4	1.2	3.2	1.1	3.8	0.9	4.6	1.0
Gujarat	7.4	20.4	5.8	10.6	5.2	10.7	5.9	8.3	6.8	8.1	6.3	9.0	7.2	9.4	6.5	6.1	6.6	4.7	5.7	4.7	6.5	5.4	6.1	5.5
Haryana	4.0	5.2	2.9	3.1	3.3	3.9	4.0	4.9	4.4	4.8	4.0	5.8	4.1	5.0	4.2	5.3	4.1	4.9	4.2	5.4	4.2	5.1	4.1	4.5
H. P.	0.2	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.1	0.3	0.1	0.2	0.2	0.3	0.1
J. & K.	0.5	0.4	0.3	0.1	0.4	neg.	0.4	0.2	0.3	0.2	0.3	0.2	0.4	0.3	0.4	0.2	0.4	0.3	0.5	0.2	0.2	0.2	0.4	0.1
Karnataka	6.8	10.0	9.0	6.4	7.6	9.3	6.0	6.9	6.3	6.6	7.1	6.8	7.0	7.3	6.2	6.3	6.3	5.8	6.0	5.9	6.3	7.4	7.2	6.2
Kerala	2.9	7.8	2.6	4.3	2.2	5.8	2.0	5.9	1.8	6.3	2.0	8.7	2.0	10.0	1.8	10.3	1.6	8.9	1.6	9.3	1.7	9.9	1.6	10.2
M.P.	4.6	9.6	3.9	5.2	3.7	6.2	4.0	4.7	3.7	4.3	3.8	5.2	3.0	5.1	3.6	5.3	3.9	4.4	3.7	4.5	4.1	4.6	4.5	4.5
Maharashtra	9.2	25.9	11.8	13.4	9.2	13.7	8.5	12.6	8.4	10.4	7.4	9.6	8.0	11.0	7.6	10.3	8.7	9.0	7.8	10.4	8.3	10.1	7.1	8.6
Orissa	2.2	2.4	1.9	1.4	1.7	1.8	1.8	1.9	1.5	2.1	1.4	2.4	1.3	2.9	1.4	3.8	1.4	3.0	1.8	2.9	1.3	5.1	1.4	1.9
Punjab	11.8	10.3	9.9	6.5	10.8	6.8	10.9	5.9	10.6	6.6	11.6	8.8	13.0	13.2	13.7	9.8	13.5	7.9	13.9	7.2	12.9	9.8	12.8	8.6
Rajasthan	2.6	4.3	2.3	2.8	2.7	5.4	2.9	4.3	2.6	3.9	2.6	4.2	2.8	4.2	2.4	3.4	2.3	3.3	2.6	3.3	2.7	3.5	2.5	2.9
T. N.	11.9	19.6	9.5	11.2	10.4	13.2	8.1	13.5	10.0	13.2	9.6	11.2	10.2	9.2	8.9	6.4	8.4	7.0	7.4	7.9	7.6	9.1	8.4	8.7
U.P.	16.3	12.7	16.0	6.5	16.8	9.0	21.4	10.0	20.1	10.4	20.6	10.8	19.2	9.7	20.9	8.4	20.9	7.6	22.4	7.2	21.3	7.3	19.6	6.6
W.B.	3.6	3.1	4.9	2.2	4.5	2.3	4.5	2.6	4.0	4.3	4.8	4.2	4.6	2.9	5.1	2.5	4.3	1.9	4.2	1.5	4.8	2.9	4.9	2.5
India	100.0	147.1	100.0	82.7	100.0	101.0	100.0	94.7	100.0	93.5	100.0	98.9	100.0	104.3	100.0	88.3	100.0	78.1	100.0	80.0	100.0	95.1	100.0	83.5

(A): Consumption of fertilisers in each State in a year as per cent of the total consumption of fertilisers in the country in that year.

(B): Short term loans advanced to farmers in each State in a year as per cent of the total expenditure on fertilisers in the country in that year, as given in the *National Accounts Statistics*, Central Statistical Organisation, Government of India.

neg. negligible.

Source: Data on fertiliser consumption from 1973-74 to 1981-82 from *Fertiliser Statistics and FAI Annual Review of Fertiliser Production and Consumption*. For 1982-83, *Indian Agriculture in Brief*, Twentieth Edition. For 1983-85, *Agricultural Statistics at a Glance*, Ministry of Agriculture, Government of India, April 1986.

Table 6. Total Loans and Advances per Borrower from Primary Agricultural Credit Societies, Classified According to Size of Land Holding

States	1976-77										1977-78										1978-79									
	Size Class of Farmers					Agri- cult- ural bor- rowers					Size Class of Farmers					Agri- cult- ural bor- rowers					Size Class of Farmers					Agri- cult- ural bor- rowers				
	Average per borrower					Average per borrower					Average per borrower					Average per borrower					Average per borrower					Average per borrower				
	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8
A. P.	619	774	810	830	1191	323	233	465	780	683	747	780	713	795	630	317	1599	720	622	650	674	328	622							
Assam	-	-	-	-	-	-	-	-	681	-	-	-	-	-	-	-	-	-	896	-	-	-	-	-	-	-	-	-	-	-
Bihar	-	-	-	-	-	-	-	-	269	-	-	-	-	-	-	-	-	-	269	69	81	183	225	238						
Gujarat	445	774	990	2057	2855	239	-	518	1475	893	1047	1418	2070	3609	307	1799	3946	1868	520	854	1472	2352	5012							
Haryana	817	1734	1602	1312	2283	407	382	500	1301	1132	1125	1521	1875	1653	480	1000	1445	1388	1210	1405	1834	1837	1683							
H. P.	239	412	558	659	290	422	497	345	388	189	397	438	735	462	173	311	247	354	422	798	665	569	393							
J. & K.	159	227	199	523	239	302	320	-	216	190	338	503	1651	755	1000	281	-	352	222	448	550	1321	619							
Karnataka	735	1146	1269	1649	1711	326	826	335	1155	567	691	1063	1498	1143	1171	1059	2560	1011	562	808	1118	1314	2223							
Kerala	213	635	597	662	619	263	298	220	384	626	810	962	803	973	505	346	386	715	886	1159	1392	1363	1558							
M.P.	214	480	761	1153	1843	226	179	-	808	250	443	730	1115	1558	276	29	87	762	335	606	865	1446	1826							
Maharashtra	363	610	902	1678	2371	226	605	995	1067	776	690	998	1569	2416	277	572	553	1227	482	683	1124	1966	2692							
Orissa	365	495	697	842	2126	-	-	-	630	488	595	686	868	1329	-	-	-	639	381	650	713	819	1594							
Punjab	534	820	1106	1508	486	-	-	-	795	1675	801	272	1066	813	1620	8205	1966	997	629	1134	1577	1145	1174							
Rajasthan	242	399	579	885	950	512	392	546	549	192	419	491	850	1203	70	150	-	609	282	446	533	795	1412							
T. N.	307	393	674	619	2233	203	1287	746	490	772	391	611	696	2393	285	950	-	635	317	341	853	678	1108							
U.P.	282	480	522	665	2410	202	514	282	504	365	506	681	760	1017	370	413	277	550	322	474	1078	902	1075							
W.B.	249	434	742	781	1199	95	115	68	395	326	511	976	1342	3900	100	98	143	490	362	559	1068	1463	2038							
India	344	602	801	1120	1654	294	584	433	677	552	602	804	1108	1632	470	1007	953	774	440	577	933	1138	1637							

(Contd.)

**Table 6. (Concld.)**  
(Rupees)

States	1978-79 (Concld.)							1979-80							1980-81							
	Agri- culti- ural Labou- rers	Tenant culti- vators	Other	Avera ge per Borro- wer	Size Class of Farmers			Agri- culti- ural Labou- rers	Tenant culti- vators	Other	Avera ge per Borro- wer	Size Class of Farmers			Agri- culti- ural Labou- rers	Tenant culti- vators	Other	Avera ge per Borro- wer				
					Upto 1	2-4	4-8					Upto 1	2-4	4-8					Upto 1	2-4	4-8	Upto 1
A. P.	717	575	715	642	675	685	708	725	790	912	616	780	712	738	663	858	1450	1708	639	454	750	838
Assam	-	-	-	609	392	350	405	477	-	-	285	289	381	340	370	451	285	-	-	115	96	349
Bihar	-	-	-	150	69	81	183	225	238	-	-	-	150	33	47	169	46	90	-	-	-	77
Gujarat	1013	1746	1276	2050	637	1080	1875	2833	5669	627	-	354	2137	523	1063	1483	3048	4928	364	-	359	1988
Haryana	1729	1296	1404	1603	1277	1414	1879	1636	1917	1286	976	1226	1623	980	1343	2523	2171	2975	1631	2186	1763	1922
H. P.	301	486	465	570	505	712	713	657	683	413	371	450	629	500	952	1014	762	594	446	386	683	745
J. & K.	50	55	-	364	85	211	967	861	949	-	-	-	226	85	211	967	861	949	-	-	-	226
Karnataka	406	881	1194	1102	808	1131	1469	2164	3108	533	913	999	1393	745	1242	2171	3008	3547	589	1506	819	1578
Kerala	771	518	542	1036	955	1339	1478	1528	1572	715	519	582	1128	1193	1678	1820	1899	1939	837	647	766	1404
M.P.	315	938	236	983	416	657	1166	1462	1939	215	-	467	1082	520	689	981	1501	1781	225	-	1647	1038
Maharashtra	277	523	410	1190	664	780	1309	2124	2645	200	575	761	1373	742	1201	2351	1670	4105	336	1119	688	1727
Orissa	324	597	415	639	540	676	871	751	2728	-	47	-	759	429	752	1262	1442	2005	626	628	1182	776
Punjab	794	437	1223	1146	632	1187	4092	1081	2276	690	687	539	1548	781	1517	2746	1506	2431	-	-	-	1740
Rajasthan	1841	-	968	644	338	410	590	927	1527	2790	1013	1547	714	350	666	930	1115	1173	1986	1543	2604	821
T. N.	651	677	-	498	120	217	372	442	751	319	333	-	262	110	160	293	232	906	299	164	-	197
U.P.	135	398	481	555	403	714	694	876	1059	475	488	478	626	434	651	758	830	704	462	463	442	611
W.B.	116	115	106	583	301	504	616	995	1548	189	210	-	457	503	629	983	968	2167	159	160	390	588
India	538	583	640	778	462	645	1003	1130	1783	619	515	672	826	516	693	1170	1247	1819	682	622	585	897

Source: Calculated from Statistical Statements Relating to the Cooperative Movement in India. Part I, Reserve Bank of India/NABARD for relevant years.



Table 7. Loans and Advances per Hectare by PACS, in Different Size Classes of Land Holdings, 1976-81

	Upto 1 Hectare										1-2 Hectares					2-4 Hectares					4-8 Hectares					Above 8 Hectares					(Rupees)
	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	
States	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	76-77	77-78	78-79	79-80	80-81	
A. P.	1238	1366	1245	1351	1477	516	498	434	457	442	270	260	225	237	286	138	119	105	121	242	119	79	62	79	171						
Assam	-	-	-	783	679	-	-	-	233	247	-	-	-	135	150	-	-	-	79	48	-	-	-	-	-	-	-	-	-	-	-
Bihar	-	-	138	138	66	-	-	54	54	31	-	-	61	61	56	-	-	37	37	8	-	-	-	24	24	9					
Gujarat	889	1786	1039	1273	1046	516	698	569	720	709	330	473	473	625	494	343	345	392	472	508	286	361	501	567	493						
Haryana	1634	2263	2421	2554	1960	1156	750	936	943	895	534	507	611	626	841	219	313	306	273	362	228	165	168	192	298						
H. P	477	379	843	1009	999	275	265	266	475	635	186	216	222	238	338	110	122	95	109	127	29	46	39	68	59						
J. & K.	318	380	445	171	171	151	225	256	141	141	66	168	183	322	322	117	275	220	144	144	24	76	62	95	95						
Karnataka	1469	1133	1125	1615	1489	764	461	539	754	828	423	354	373	490	724	275	250	271	361	501	171	114	222	311	355						
Kerala	425	1251	1772	1910	2385	423	540	772	893	1119	199	321	464	493	607	110	134	227	255	317	62	97	156	157	194						
M.P.	427	501	669	832	1040	320	295	405	438	459	254	243	288	389	324	192	186	241	244	250	184	156	183	194	178						
Maharashtra	727	1551	963	1328	1484	407	460	456	520	801	301	333	375	436	784	280	262	328	354	278	237	242	270	265	411						
Orissa	730	977	761	1080	858	330	396	433	450	502	232	229	238	290	421	140	145	137	125	240	213	133	159	273	201						
Punjab	1068	3349	1257	1264	1562	546	534	756	791	1011	369	91	526	1364	915	251	178	191	180	251	49	81	117	228	243						
Rajasthan	484	384	564	675	700	266	279	298	273	444	193	164	178	197	310	148	142	133	155	186	95	120	141	153	117						
T. N.	613	1544	633	240	219	262	260	227	145	107	225	203	2115	124	98	103	116	113	74	39	223	239	111	75	91						
U.P.	564	729	645	807	867	320	337	316	476	434	174	227	359	231	253	111	127	150	146	139	241	102	107	106	70						
W.B.	497	652	723	601	1007	290	341	372	336	419	247	325	356	205	328	130	274	244	166	161	120	390	204	155	217						
India	689	1104	879	925	1032	401	402	385	431	462	267	268	311	334	390	187	185	190	188	208	165	163	164	178	182						

Source: Calculated from Statistical Statements Relating To The Cooperative Movement In India, Part I, Reserve Bank of India/NABARD for relevant years.

Table 8. Per Borrower Short Term Loans to Agriculture Distributed by Commercial Banks According to Size of Land Holding, 1979-84 (Rupees)

States	1979-80 -hectares-					1980-81 -hectares-				
	Upto 1	1 to 2	2 - 4	Above 4	Total	Upto 1	1 to 2	2 - 4	Above 4	Total
A. P.	1381	2517	2588	5420	2342	1584	2348	3348	5987	2486
Assam	334	199	426	50000	450	352	655	818	7527	610
Bihar	533	1141	1518	2094	940	795	1245	1777	2975	1191
Gujarat	1747	2721	4504	7612	4414	1676	3178	4748	8076	4771
Haryana	1539	1849	2809	5738	2749	1819	1743	2625	6660	2863
H. P.	979	2721	4677	4667	1526	1750	3857	6852	9474	2745
J. & K.	1234	2321	7792	30509	3054	1286	2473	6283	13983	4350
Karnataka	1346	1995	4394	8649	2342	1224	1900	3714	7142	2528
Kerala	914	1516	2091	6907	1142	1133	1814	2691	16324	1395
M.P.	1996	2174	2095	2377	2198	1591	1829	1954	2661	2095
Maharashtra	1607	2493	3364	6256	3387	1821	2522	3703	5683	3632
Orissa	2428	2716	2091	2459	2475	1458	1725	1575	1580	1565
Punjab	2129	2722	3704	4874	3402	2237	2974	3652	5151	3591
Rajasthan	1249	1504	2129	3577	2404	1226	1777	2290	3473	2476
T. N.	1261	1405	2404	3631	1476	1403	1605	2545	6196	1624
U.P.	560	877	1819	2182	1087	826	1331	2358	6939	1907
W.B.	1055	1211	2127	8946	1304	2211	1484	2100	7561	2080
India	1186	1800	2677	4849	1867	1368	1883	2939	5485	2071

(Contd.)

States	1981-82 -hectares-					1982-83 -hectares-					1983-84 -hectares-					(Rupees)
	Upto 2.5	2.5 to 5	5-10	Above 10	Total	Upto 2.5	2.5 to 5	Above 5	Total	Upto 2.5	2.5 to 5	Above 5	Total			
A. P.	1743	2509	3837	5323	2599	2185	2825	5493	3175	1770	3084	5707	2897			
Assam	1799	1257	1173	93539	3250	2009	3588	6400	3190	1687	2318	8632	2428			
Bihar	887	1217	1591	2753	1168	1497	1768	2769	1751	1023	886	1482	1035			
Gujarat	1391	2836	4879	6645	3815	1499	3309	7218	5097	2987	4693	7842	6190			
Haryana	3544	5472	6913	9051	6183	3141	3919	5886	4885	2589	3672	5596	4592			
H. P.	2307	3233	7679	10455	2791	2014	2087	6667	2206	2497	2938	2267	2576			
J. & K.	1305	2291	20789	5063	3242	2496	2903	25000	2891	2241	16177	28649	9338			
Karnataka	1862	3022	4077	7753	3319	2075	3264	6334	3608	2520	3793	6975	4143			
Kerala	1712	2406	4458	10831	1936	1830	2296	3646	1983	2094	2461	4106	2243			
M.P.	1048	1213	1363	3548	1516	1500	1677	2765	2154	1223	1946	3068	2293			
Maharashtra	2332	2922	4269	6412	4172	2921	3463	4505	3975	3635	3392	4972	4229			
Orissa	1137	1675	1845	2403	1368	1151	5877	6288	3868	1166	5197	7103	3977			
Punjab	2030	2999	5010	6496	3810	4549	3984	4411	4312	2775	4430	5709	4947			
Rajasthan	4842	1844	2483	4053	3547	2379	2641	4756	4056	1769	2676	4050	3477			
T. T. N.	1894	2400	3581	9073	2295	2044	2433	3371	2331	2113	2444	4140	2480			
U.P.	996	1644	2217	3378	1658	1365	2280	3963	2323	1423	2247	4054	2354			
W.B.	1137	3341	4331	10620	2005	975	1457	12414	1413	1499	1974	6671	1872			
India	1703	2395	3525	6020	2490	1916	2763	4898	2778	1978	2926	5447	2952			

Notes: The Original Tables give the classes in acres; these are converted into hectares at the rate of 2.5 acres = 1 hectare  
Source: *Report on Currency and Finance*, Vol. II Reserve Bank of India, for relevant years.

**Table 9. Borrowers from PACS During a Year as percentage of Total Membership of PACS During the Year** (Per cent)

	1976-77					1977-78					1978-79																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	Farmers with Land Holdings			Agricu- ltural Labou- rers	Others	Total Borro- wers	Farmers with Land Holdings			Agricu- ltural Labou- rers	Others	Total Borro- wers	Farmers with Land Holdings			Agricu- ltural Labou- rers	Others	Total Borro- wers																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	- Hectares -		Upto 1				1-2	Above 2	- Hectares -				Upto 1	1-2	Above 2				- Hectares -		Upto 1	1-2	Above 2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Upto 1	1-2							Upto 1										1-2	Upto 1				1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 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1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 1	1-2	Upto 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(Contd.)

Table 9. (Concd.)

	1979-80										1980-81									
	Farmers with Land Holdings					Agricultural Labourers					Farmers with Land Holdings					Agricultural Labourers				
	- Hectares -					- Hectares -					- Hectares -					- Hectares -				
	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8	Upto 1	1-2	2-4	4-8	Above 8
A. P.	31.6	35.8	40.0	51.7	44.9	6.7	7.6	29.0	34.1	42.5	41.1	27.0	24.5	9.7	5.6	28.1				
Assam	1.7	1.1	3.5	10.5	-	-	0.7	1.4	1.7	1.5	8.2	15.0	-	-	0.9	1.9				
Bihar	-	-	-	-	-	-	-	-	21.5	51.6	71.4	23.7	-	-	-	39.9				
Gujarat	51.7	57.5	46.8	35.9	42.4	3.3	2.5	38.9	49.2	46.9	41.6	32.7	42.9	1.8	0.6	35.6				
Haryana	47.1	55.1	68.3	83.1	-	9.2	10.3	52.0	63.4	69.2	57.9	91.8	91.3	20.7	17.4	56.9				
H. P.	11.3	18.2	20.0	17.6	50.0	20.0	18.2	16.8	13.2	16.6	18.2	20.0	69.2	28.6	22.7	17.6				
J. & K.	47.7	-	13.3	20.0	20.0	-	-	39.3	-	-	-	-	-	-	-	39.3				
Karnataka	23.8	24.2	21.8	20.9	16.6	4.1	7.2	18.7	29.2	25.4	18.8	17.2	14.3	2.1	14.3	18.7				
Kerala	42.0	62.1	-	-	-	14.0	15.1	42.0	40.3	55.6	94.6	-	-	13.7	13.6	39.5				
M.P.	39.6	34.9	29.5	37.9	34.8	7.7	0.7	32.6	36.8	36.3	37.6	35.7	36.5	9.6	1.1	35.0				
Maharashtra	22.2	29.6	23.1	38.0	34.3	12.1	4.1	24.9	30.2	31.4	21.1	52.9	24.9	8.5	1.0	26.8				
Orissa	35.6	32.9	42.3	62.3	64.6	-	-	36.7	42.8	40.1	35.4	29.7	40.6	9.4	4.3	36.7				
Punjab	100.0	100.0	58.8	72.5	72.4	12.3	34.3	73.4	98.8	100.0	84.9	82.0	68.4	-	-	69.0				
Rajasthan	39.8	46.4	49.9	32.8	-	2.1	0.5	40.5	52.0	45.5	37.4	39.3	53.7	3.1	1.8	37.7				
T. N.	48.3	85.6	68.4	75.6	63.3	2.5	-	52.8	44.8	74.4	61.5	65.3	41.1	2.1	-	46.6				
U. P.	52.1	45.2	49.6	39.6	47.2	2.4	23.9	42.3	76.1	40.2	41.7	42.9	34.4	9.0	7.1	35.6				
W.B.	37.5	53.9	53.7	19.2	27.3	12.3	-	39.7	30.4	47.0	16.4	12.0	9.4	9.5	14.5	30.2				
India	38.1	35.7	43.7	39.0	57.9	6.0	8.4	36.0	35.9	43.1	40.7	38.9	47.5	6.7	7.8	34.2				

Source: Calculated from *Statistical Statements Relating to the Cooperative Movement in India*, Part I, Reserve Bank of India/NABARD for relevant years.

**Table 10. Members of PACS in Specific Size Class of Land Holdings, as Percentage of the Total Number of Land Holdings in the Size Class in 1981. Borrowers in Size Class as Per Cent of All Land Holders in the Class, and Borrowers as Per Cent of Total Members in 1981.**

(Per cent)

States		-Hectares-				Total
		Less than 1	1-2	2-4	4 & Above	
Andhra Pradesh	A)	26.95	62.04	65.21	100.97	48.70
	B)	9.19	26.34	26.78	26.41	18.56
	C)	34.11	42.45	41.07	26.16	38.11
Assam	A)	71.52	151.82	27.10	20.47	81.56
	B)	1.25	2.29	7.23	3.07	1.78
	C)	1.74	131	8.24	3.07	2.19
Bihar	A)	17.45	110.52	68.33	302.83	45.58
	B)	3.76	56.98	48.78	126.32	19.23
	C)	21.52	51.56	71.38	41.71	42.20
Gujarat	A)	44.90	46.34	46.16	73.96	54.03
	B)	22.10	21.75	19.23	26.95	42.07
	C)	49.22	46.94	41.67	36.40	42.07
Haryana	A)	43.30	108.71	101.47	76.87	77.30
	B)	27.03	75.22	58.80	70.46	57.73
	C)	62.41	69.19	57.94	91.67	74.68
Himachal Pradesh	A)	57.86	120.54	102.59	129.10	83.84
	B)	7.66	19.97	18.65	38.93	14.73
	C)	13.24	16.57	18.18	30.16	17.57
Jammu & Kashmir	A)	20.50	34.68	57.80	138.41	29.94
	B)	9.77	43.77	7.71	27.68	15.84
	C)	47.65	126.23	13.33	20.00	52.90
Karnataka	A)	44.80	63.00	75.73	88.46	64.42
	B)	13.10	15.99	14.27	14.19	14.48
	C)	29.24	25.38	18.85	16.04	22.48
Kerala	A)	37.90	195.65	193.37	263.29	55.56
	B)	16.36	108.70	182.85	367.09	31.76
	C)	43.17	55.56	94.56	139.42	57.17
Madhya Pradesh	A)	26.78	64.66	66.64	65.83	52.97
	B)	9.85	23.48	25.08	23.74	19.42
	C)	36.77	36.32	37.64	36.06	36.67

(Contd.)

Table 10. (Concl.)

(Per cent)

States		-Hectares-				Total
		Less than 1	1-2	2-4	4 & Above	
Maharashtra	A)	41.66	62.57	89.54	76.93	66.34
	B)	12.60	19.64	18.88	32.18	20.40
	C)	30.25	31.38	21.08	41.83	30.76
Orissa	A)	52.51	77.28	71.24	84.89	65.20
	B)	22.50	31.03	25.22	26.55	25.64
	C)	42.84	40.14	35.40	31.28	39.33
Punjab	A)	128.74	122.37	115.17	137.61	126.67
	B)	127.22	122.37	97.77	106.71	111.19
	C)	98.22	100.00	84.89	77.54	87.78
Rajasthan	A)	41.45	75.31	75.20	69.48	63.56
	B)	21.56	34.29	28.12	30.85	28.28
	C)	52.01	45.54	37.39	44.40	44.50
Tamil Nadu	A)	38.19	76.51	98.80	183.23	56.41
	B)	17.11	56.91	60.80	105.54	32.50
	C)	44.80	74.38	61.54	59.60	57.62
Uttar Pradesh	A)	20.75	71.43	24.18	149.46	32.50
	B)	8.63	28.71	10.09	61.09	13.43
	C)	41.59	40.19	41.75	40.88	41.32
West Bengal	A)	22.85	56.31	52.75	145.63	34.40
	B)	6.96	26.46	8.66	16.77	11.37
	C)	33.45	46.99	16.42	11.52	33.04
India	A)	29.91	75.59	75.95	99.88	52.57
	B)	10.74	32.57	30.94	41.25	21.27
	C)	35.91	43.09	40.73	41.30	40.46

A): Number of members of PACS as percentage of number of land holdings.

B): Number of borrowers during the year from PACS as percentage of number of land holdings.

C): Number of borrowers during the year from PACS as percentage of number of members of PACS.

Table 11. Percentage Distribution of Borrower Accounts in Different Size Classes of Land Holding to Total Number of Borrowers of Short Term Loans from Commercial Banks, 1979-S4

States	1979-80 -Hectares-				Total Number of Accounts	1980-81 -Hectares-				Total Number of Accounts	Per cent)
	Upto 1	1-2	2-4	Above 4		Upto 1	1-2	2-4	Above 4		
A. P.	39.1	28.5	23.7	8.7	245604	46.8	27.1	17.2	8.9	379003	
Assam	49.0	41.1	9.6	0.3	2445	61.5	27.1	9.6	1.8	5083	
Bihar	50.2	29.7	15.2	4.9	33313	47.0	33.6	15.0	4.4	47613	
Gujarat	22.3	21.6	26.8	29.3	18216	21.9	19.8	28.0	30.3	50121	
Haryana	21.6	34.2	25.7	18.5	12333	23.9	32.3	26.1	17.7	28925	
H. P	76.7	16.0	5.4	1.9	8258	71.3	18.2	8.0	2.5	7688	
J. & K.	64.2	23.8	8.7	3.3	1768	53.4	20.8	5.5	20.3	34941	
Karnataka	43.3	30.3	15.6	10.8	65516	45.3	27.9	13.8	13.0	201664	
Kerala	83.8	10.8	33	2.1	160654	85.6	10.8	2.6	1.0	384801	
M.P.	15.3	18.5	29.6	36.6	20933	16.7	19.0	32.5	31.8	40670	
Maharashtra	23.5	25.5	28.4	22.6	35550	19.8	23.5	27.5	29.2	81791	
Orissa	53.3	29.9	12.1	4.7	28486	40.4	23.9	18.7	17.0	199499	
Punjab	27.1	18.1	28.9	25.9	47794	23.9	17.2	32.6	26.3	112524	
Rajasthan	18.8	18.2	24.8	38.2	10234	18.4	17.9	23.3	40.4	19511	
T. N.	65.9	22.2	8.0	3.9	315917	69.7	21.1	72	2.0	638448	
U.P.	37.5	32.2	18.3	12.0	104838	42.8	28.8	17.4	11.0	184822	
W.W.B.	61.0	29.4	8.1	1.5	54836	68.7	24.1	6.2	1.0	84358	
India	52.7	23.9	14.8	8.6	1182412	55.4	22.0	13.4	9.2	2496471	

(Contd.)

(Contd.)



Table 11. (Concl'd.)

States	1981-82 -Hectares-				1982-83 -Hectares-				1983-84 -Hectares-			
	Upto 1	1-2	2-4	Above 4	Total Number of Acco- units	Upto 1	1-2	Above 2	Total Number of Acco- units	Upto 1	1-2	Above 2
A. P.	46.5	29.1	16.3	8.1	214127	42.8	33.0	23.4	384440	49.1	33.5	17.4
Assam	57.3	29.9	11.0	1.8	1418	50.1	35.9	14.0	1787	69.3	22.0	8.7
Bihar	48.4	32.8	15.3	3.5	23509	59.6	25.9	14.5	20506	51.1	35.6	13.3
Gujarat	30.0	22.0	23.3	24.6	20584	22.8	20.8	56.4	40886	18.7	23.6	57.7
Haryana	29.0	21.1	24.8	25.1	6368	18.0	25.8	56.2	9908	18.2	23.4	58.4
H. P.	72.0	23.6	3.5	0.9	2316	72.3	23.9	3.8	2403	67.1	23.0	9.9
J. & K.	53.9	33.6	7.2	5.3	1507	67.9	30.9	1.2	1003	64.7	18.5	16.8
Karnataka	43.3	26.3	17.4	13.0	78536	42.9	29.3	27.8	194930	43.4	28.3	28.3
Kerala	86.1	10.8	2.1	1.0	95547	81.3	13.8	4.9	358384	80.7	14.6	4.7
M.P.	8.9	32.3	48.3	10.5	31066	21.1	31.2	47.7	22377	22.6	31.8	45.6
Maharashtra	19.5	24.5	27.5	28.5	45028	17.1	24.9	58.0	72387	21.3	29.0	49.7
Orissa	63.5	25.4	8.2	2.9	40775	45.5	19.5	35.0	56651	45.1	23.4	31.5
Punjab	30.9	25.9	26.9	16.3	60618	12.8	27.6	59.6	88388	15.6	23.9	60.5
Rajasthan	25.8	15.7	23.1	35.4	11167	12.2	19.1	68.7	15854	15.4	16.1	68.5
T. N.	66.5	23.3	8.2	2.0	260562	59.0	27.4	13.6	549457	55.6	31.4	13.0
U.P.	43.7	27.7	17.1	11.5	99127	46.4	25.9	27.7	99495	43.1	31.3	25.6
W.B.	73.2	21.8	4.1	0.9	39095	73.3	23.8	2.9	86992	68.4	26.9	4.7
India	52.7	24.6	14.5	8.2	1044356	52.8	25.6	21.6	2032920	51.0	28.8	20.2

Note: The original tables give the classes in acres; these are converted into hectares at the rate of 2.5 acres = 1 hectare.

Source: *Report on Currency and Finance, Vol II*, Reserve Bank of India, for relevant years.

**Table 12. Borrowers of Short Term Loans from Commercial Banks as Percentage of Borrowers from PACS, 1979-110 to 1983-84**

State	(Per cent)			
	1979-80	1980-81	1982-83	1983-84
A. P.	16.1	24.5	20.1	-
Assam	7.4	12.1	-	-
Bihar	20.0	2.2	-	-
Gujarat	2.5	7.5	5.7	7.8
Haryana	2.2	4.5	1.3	-
H. P	9.4	7.3	2.3	3.5
J. & K.	1.1	2.1	-	-
Karnataka	9.9	29.2	30.4	27.9
Kerala	10.7	25.8	19.7	18.9
M.P.	2.0	3.2	1.7	3.1
Maharashtra	2.7	5.7	4.7	7.1
Orissa	3.4	23.0	6.5	7.7
Punjab	3.7	9.9	8.3	-
Rajasthan	0.8	1.5	1.1	1.8
T. N.	12.0	27.1	48.9	67.9
U.P.	3.0	6.0	3.3	-
W.B.	6.0	12.1	12.2	-
India	6.0	12.7	10.2	14.8

Table 13. Share of Cooperatives (Including L.D.E.S.), Commercial Banks and R.R.B.S. in the Total Term Loan to Agriculture and Allied Activities in the Different States 1973-74 to 1984-85

States	1973-74		1974-75		1975-76		1976-77		1977-78		1978-79		1979-80	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
A. P.	63.5	36.5	59.0	41.0	73.1	26.9	79.8	20.2	81.7	18.3	65.3	34.7	66.2	33.8
Assam	39.6	60.4	46.3	53.7	40.9	59.1	38.9	61.1	69.5	30.5	47.6	52.4	32.6	67.4
Bihar	57.1	42.9	77.8	22.2	71.8	28.2	58.5	41.5	38.4	61.6	30.3	69.7	35.7	64.3
Gujarat	56.9	43.1	91.6	8.4	78.4	21.6	62.2	37.8	70.7	29.3	50.9	49.1	36.9	63.1
Haryana	51.2	48.8	66.0	34.0	63.1	36.9	55.3	44.7	56.4	43.6	47.7	52.3	49.1	50.9
H. P.	83.9	16.1	81.7	18.3	77.4	22.6	66.9	33.1	77.4	22.6	68.6	31.4	50.8	49.2
J. & K.	58.1	41.9	51.5	48.5	27.5	72.5	61.0	39.0	65.2	34.8	29.4	70.6	30.8	69.2
Karnataka	58.2	41.8	56.3	43.7	50.6	49.4	59.5	40.5	47.9	52.1	29.7	70.3	35.9	64.1
Kerala	72.1	27.9	58.7	41.3	47.0	53.0	66.3	33.7	73.4	26.6	75.7	24.3	73.9	26.1
M.P.	55.7	44.3	70.5	29.5	57.2	42.8	62.4	37.6	45.2	54.6	52.5	47.5	62.1	37.9
Maharashtra	39.1	60.9	58.0	42.0	74.2	25.8	63.4	36.6	54.7	45.3	54.9	45.1	53.7	46.3
Orissa	79.9	20.1	86.8	13.2	77.2	22.8	82.5	17.5	20.4	32.9	63.0	37.0	81.5	18.5
Punjab	56.0	44.0	71.7	28.3	53.6	46.4	55.4	44.6	39.6	60.4	33.1	66.9	31.2	68.8
Rajasthan	31.0	69.0	55.9	44.1	45.0	55.0	51.3	48.6	55.4	44.6	41.5	58.5	54.4	45.6
T. N.	65.8	34.2	74.1	25.9	54.5	45.5	61.0	39.0	54.9	45.1	50.5	49.5	29.7	70.3
U.P.	47.2	52.8	65.9	34.1	61.2	38.8	60.4	39.6	58.6	41.4	46.4	53.6	62.8	37.2
W.B.	11.9	88.1	48.5	51.5	47.9	52.1	68.4	31.6	50.4	49.6	63.1	36.9	52.3	47.6
Others	64.4	35.6	18.1	81.9	13.7	86.3	3.7	96.3	10.2	89.8	7.9	92.1	11.8	88.2
India	52.4	47.6	70.0	30.0	62.5	37.5	62.7	37.3	58.7	41.3	50.1	49.9	53.1	46.9

(Contd.)

Table 13. (Concld.)

States	1980-81			1981-82			1982-83			1983-84			1984-85			(Per cent)
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	
A. P.	65.0	29.4	5.6	55.1	38.6	6.3	62.5	32.1	5.4	45.7	48.6	5.7	41.2	53.1	5.7	
Assam	30.6	47.5	21.9	37.6	35.0	27.4	37.1	42.8	20.1	28.1	54.4	17.5	25.6	66.8	7.6	
Bihar	35.0	39.3	25.7	41.8	33.2	25.0	33.3	29.0	37.7	25.0	35.5	39.5	17.0	58.3	24.7	
Gujarat	27.9	71.5	0.6	61.3	38.2	0.5	66.5	32.9	0.6	50.1	48.4	1.5	27.9	69.2	2.9	
Haryana	41.9	55.0	3.1	44.8	52.5	2.7	50.5	44.1	5.4	41.6	56.5	1.9	36.7	57.6	5.7	
H. P.	52.1	41.5	6.4	45.1	43.8	11.1	53.8	33.4	12.8	57.3	30.8	11.9	56.4	31.8	11.8	
J. & K.	17.4	64.4	18.2	15.7	64.9	19.4	21.6	32.7	45.7	16.3	42.0	41.1	11.9	44.2	43.9	
Karnataka	38.0	56.0	6.0	29.2	63.7	7.1	37.1	54.4	8.5	31.5	58.9	9.6	27.2	65.9	6.9	
Kerala	61.8	35.1	3.1	59.6	37.2	3.2	69.9	25.9	4.2	68.4	29.2	2.4	64.2	32.5	3.3	
M.P.	36.4	59.3	4.3	38.0	55.6	6.4	43.8	47.8	8.4	59.0	28.0	13.0	32.2	53.0	14.8	
Maharashtra	60.4	39.6	-	48.8	51.2	-	63.7	36.3	-	51.7	48.0	0.3	47.2	51.2	1.6	
Orissa	35.0	61.2	3.8	39.3	50.1	10.6	54.8	25.4	19.8	46.8	38.9	14.3	23.5	69.7	6.8	
Punjab	24.8	75.2	-	29.8	70.2	-	37.2	62.8	-	31.1	68.8	0.1	31.6	68.1	0.3	
Rajasthan	51.9	38.9	9.2	53.8	35.1	11.1	56.5	33.0	10.5	29.5	56.9	13.6	36.0	51.8	12.2	
T. N.	10.5	85.8	3.7	12.7	85.8	1.5	32.6	65.3	2.1	19.5	78.4	2.1	24.1	75.9	-	
U.P.	40.9	52.8	6.3	39.1	52.1	8.8	46.4	39.4	14.2	44.1	40.3	15.6	34.0	50.6	15.3	
W.B.	37.1	55.0	7.9	35.6	54.6	9.8	34.2	52.4	13.4	43.4	41.2	15.4	23.1	66.0	10.9	
Others	12.3	75.8	11.9	12.8	77.2	10.0	9.7	84.5	5.8	2.3	95.5	2.2	4.2	95.6	0.2	
India	42.5	52.7	4.8	41.4	52.8	5.8	50.8	41.4	7.8	40.9	51.6	7.5	34.1	58.6	7.3	

Col.(1): Loans by PACS & LDBs; col(2): Loans by Commercial Banks, including RRBs upto 1979-80 and separately thereafter; col(3): From 1980-81 onwards, loans by RRBs.

Source: Data from Reserve Bank of India and NABARD, obtained through the good offices of NABARD.

**Table 14. Borrowers of Term Loans from Commercial Banks, in Different Size Classes of Land Holding, as Percentage of Total Number of Land Holders in the Size Class, 1980-81**

(Per cent)

State	-Hectares-				Total
	Upto 1	1-2	2-4	Above 4	
A. P.	0.49	0.63	0.36	0.25	0.47
Assam	0.04	0.02	0.02	0.04	0.03
Bihar	0.21	0.84	0.40	0.39	0.30
Gujarat	0.73	0.74	0.75	1.09	0.84
Haryana	1.35	1.55	1.66	3.36	2.02
H. P	0.88	0.56	0.31	0.41	0.72
J. & K.	0.27	0.75	0.37	0.13	0.58
Karnataka	0.68	0.36	0.66	1.03	0.79
Kerala	0.60	3.14	3.60	1.35	0.87
M.P.	0.63	1.64	1.56	1.26	1.18
Maharashtra	0.54	0.58	0.53	0.64	0.57
Orissa	1.52	1.40	1.57	3.07	1.62
Punjab	4.31	2.80	3.38	5.32	4.22
Rajasthan	0.65	1.21	0.88	0.88	0.87
T. N.	0.26	0.40	0.39	1.02	0.34
U.P.	0.22	0.85	0.21	1.95	0.36
W.B.	0.24	0.51	0.24	0.66	0.30
India	0.40	0.90	0.80	1.20	0.60

Note: The original tables give the classes in acres; these are converted into hectares at the rate of 2.5 acres = 1 hectare.

Source: The total number of land holdings in each size class, statewise taken from the *Agricultural Census, 1981*, and borrowers from commercial banks from *Report on Currency and Finance Vol. II*, (RBI).

**Table. 15. Members and Borrowers of Term Loans from Central and Primary Land Development Banks as Percentage of Total Land Holders, Members, etc., in 1980-81**

State	Regular Members as per cent of total	Nominal Members Number of	Borrowers Cultivators	Borrowers as per cent of Regular Members	Borrowers as per cent of Nominal Members	Loan per Bor- rower and by Cen- tral
A. P.	13.06	2.44	1.94	14.82	79.20	4126
Assam	0.71	0.10	0.01	1.59	11.70	11703
Bihar	2.81	-	0.22	7.96	-	5697
Gujarat	16.62	0.07	0.12	0.70	170.87	16877
Haryana	15.85	1.54	2.54	16.20	164.36	11884
H. P	1.54	0.50	0.05	3.56	10.98	8543
J. & K.	3.11	1.78	0.06	1.81	3.07	6045
Karnataka	18.46	5.06	1.16	6.28	22.92	3967
Kerala	8.14	1.59	1.00	12.29	62.84	5457
M.P.	4.11	12.18	0.35	8.56	2.89	8634
Maharashtra	10.86	0.09	1.20	11.02	1371.50	6577
Orissa	7.30	7.40	0.85	11.61	11.46	3585
Punjab	28.30	-	4.75	16.79	-	8872
Rajasthan	7.25	1.66	0.53	7.37	32.26	7189
T. N.	7.10	12.20	0.04	0.60	0.35	11851
U.P.	5.10	-	0.30	5.84	-	7914
W.B.	250	0.05	0.25	9.80	501.78	4291
India	7.64	2.80	0.66	8.59	23.45	6184

Source: Numbers of Regular, Nominal members and borrowers from *Statistical Statements Relating to the Cooperative Movement in India, Part I*, Reserve Bank of India/NABARD amount borrowed supplied by NABARD; data on total cultivators (land holdings) from *Agricultural Census, 1981*.

**Table 16. Borrowers Accounts of Commercial Banks for Term Loans as Percentage of the Total Number of Borrowers from LDBS, 1979-74**

STATE	1979-80	1980-81	1982-83	1983-84
Andhra Pradesh	13.1	24.3	22.3	43.8
Assam	49.6	285.3	-	-
Bihar	180.9	1345	-	353.1
Gujarat	453.6	717.7	345.8	309.4
Haryana	35.7	79.3	74.4	-
Himachal Pradesh	890.7	1305.7	1191.9	1134.5
Jammu & Kashmir	161.4	632.6	165.6	149.9
Karnataka	29.3	68.1	145.5	192.3
Kerala	66.7	87.1	138.8	114.7
Madhya Pradesh	119.5	336.3	184.2	158.8
Maharashtra	36.6	47.8	103.5	154.8
Orissa	18.7	190.9	45.2	42.3
Punjab	33.8	56.9	-	126.0
Rajasthan	82.0	163.3	118.5	233.4
Tamil Nadu	71.4	766.2	205.0	138.2
Uttar Pradesh	33.5	120.0	113.8	101.4
West Bengal	65.5	123.5	50.0	-
India	45.8	93.4	83.8	115.6

Table 17. Term Loan Borrower Accounts of Commercial Banks in Different Size Classes of Land Holding, as Percentage of Total Term Loan Borrower Accounts in a Year

State	1979-80					1980-81					1981-82					1982-83					1983-84				
	Upto 1	1-2	2-4	Above 4	Total Number of Account	Upto 1	1-2	2-4	Above 4	Total Number of Account	Upto 1	1-2	2-4	Above 4	Total Number of Account	Upto 1	1-2	Above 4	Total Number of Account	Upto 1	1-2	Above 4	Total Number of Account		
A. P.	41.9	26.5	20.1	11.5	18018	53.7	28.1	12.3	5.9	36038	43.6	34.0	11.0	11.4	15587	42.8	29.6	27.6	37806	47.7	27.9	24.4	75227		
Assam	50.0	23.4	14.9	11.7	128	72.4	15.7	7.0	4.9	729	54.0	30.3	10.0	5.7	769	65.4	30.2	4.4	2180	49.1	42.5	8.4	5441		
Bihar	45.0	37.7	11.5	5.7	25711	52.0	30.4	11.3	6.3	33700	53.4	31.7	8.9	6.0	23120	58.0	23.2	18.8	27704	60.7	28.4	10.9	44778		
Gujarat	26.5	20.5	21.7	31.3	14243	21.1	19.0	22.1	37.8	24623	57.9	9.8	10.7	21.6	20551	27.6	25.1	47.3	26620	22.4	24.0	53.6	41558		
Haryana	21.1	14.9	24.8	39.2	8061	21.6	14.8	17.2	46.4	2374	42.5	23.9	11.7	21.9	8299	23.8	20.9	55.3	15691	32.1	27.3	40.6	30578		
H. P.	79.1	4.7	14.7	1.5	3251	67.7	17.1	10.8	4.4	4570	59.0	27.6	10.0	3.4	4223	65.2	23.6	11.2	5590	63.0	30.9	6.1	5820		
J. & K.	44.9	32.0	21.8	1.3	762	52.6	36.0	10.3	1.1	3682	25.4	59.8	5.8	9.0	2404	56.1	30.0	13.9	1878	53.9	32.7	13.4	1477		
Karnataka	36.1	24.2	19.3	20.4	10758	29.9	26.7	17.8	25.6	34003	42.9	28.7	16.4	12.0	21550	44.9	23.9	31.2	62426	40.0	28.5	31.5	95027		
Kerala	63.0	23.8	7.8	5.4	16210	60.9	25.0	12.2	1.9	36469	56.4	16.4	26.1	1.1	18873	77.5	15.6	6.9	32721	58.4	28.9	12.7	42163		
M.P.	13.7	28.2	31.0	27.1	42533	17.5	26.6	27.4	28.5	75846	22.0	28.4	27.7	21.9	22779	27.0	28.5	44.5	46199	29.3	33.1	37.6	60604		
Maharashtra	21.5	26.2	26.6	25.7	16339	28.0	23.0	22.2	26.8	39380	24.2	24.1	22.7	29.0	23001	31.6	28.4	40.0	45032	33.2	31.3	35.5	75623		
Orissa	55.2	28.9	12.3	3.6	8227	43.8	23.2	17.2	15.2	53877	42.4	20.9	34.9	1.8	21086	47.0	14.9	38.1	36766	40.9	20.5	38.6	35497		
Punjab	16.4	13.7	19.9	50.0	14055	19.7	12.9	23.7	43.7	43341	17.8	21.2	16.0	45.0	14585	17.6	20.7	61.7	31339	15.3	22.1	62.6	39507		
Rajasthan	14.7	22.2	27.9	35.2	22694	21.7	27.0	20.5	30.8	39198	49.7	14.5	19.5	16.3	17790	25.0	22.3	52.7	31017	32.9	23.9	43.2	42987		
T. N.	48.9	17.6	16.4	17.1	9160	54.9	20.8	10.8	13.5	23401	58.2	27.0	7.5	7.3	21873	57.1	28.7	14.2	45057	51.5	31.3	17.2	76492		
U.P.	33.1	33.5	15.9	17.5	34961	34.9	30.9	16.2	18.0	79746	42.9	26.1	16.0	15.0	59467	47.7	26.4	25.9	76878	46.1	31.0	22.9	79074		
W.B.	52.4	30.9	11.2	5.5	11656	55.6	33.3	6.9	4.2	17781	52.1	37.1	8.0	2.8	6040	73.2	17.6	9.2	8034	74.6	16.8	8.6	14760		
India	32.8	26.5	19.9	20.8	260796	35.5	25.0	18.0	21.5	573212	43.3	24.6	17.3	14.8	304465	42.9	24.4	32.7	538256	41.3	28.4	30.3	782506		

Note: The Original tables give the classes in acres; these are converted into hectares at the rate of 2.5 acres = 1 hectare

Source: Report on Currency and Finance, Vol II, Reserve Bank of India, for relevant years.



**Table 18. Share of Borrowers in Different Size Classes of Land Holdings in the Total Loans Advanced to Land Holders by Commercial Banks 1979-84**  
(Per cent)

States	1979-80 -hectares-				1980-81 -hectares-				1981-82 -hectares-				1982-83 -hectares-				1983-84 -hectares-			
	Upto 1	1-2	2-4	Above 4	Upto 1	1-2	2-4	Above 4	Upto 1	1-2	2-4	Above 4	Upto 1	1-2	2-4	Above 4	Upto 1	1-2	2-4	Above 4
A. P.	21.8	14.1	21.3	42.8	3.9	5.4	14.5	76.2	25.1	28.2	12.0	34.7	25.0	27.3	47.7	21.9	26.2	51.9		
Assam	20.0	20.0	-	60.0	12.1	1.7	15.5	70.7	42.3	29.2	17.2	11.3	40.0	29.6	30.4	37.7	27.5	34.8		
Bihar	26.0	26.1	10.8	37.1	29.8	25.9	13.3	31.0	41.6	29.0	10.2	19.2	40.8	23.3	35.9	40.7	26.7	32.6		
Gujarat	8.1	10.3	14.6	67.0	6.3	5.8	11.9	76.0	12.7	6.2	13.3	67.8	9.1	12.2	78.7	8.9	11.8	79.3		
Haryana	3.6	4.2	20.9	71.3	3.9	5.5	14.7	76.2	9.2	10.2	15.1	65.5	7.4	12.2	80.4	8.5	12.3	79.2		
H. P.	42.1	8.8	40.3	10.5	45.3	13.7	17.5	24.0	37.0	30.6	18.6	13.8	49.6	31.6	18.8	42.2	20.8	37.01		
J. & K.	44.5	14.8	29.6	11.1	35.8	20.4	38.3	6.2	20.7	16.2	11.2	51.9	43.5	27.1	29.4	9.8	6.6	83.6		
Karnataka	14.3	9.4	22.3	54.0	10.3	11.3	14.7	63.7	17.5	21.9	23.0	37.6	19.6	15.5	64.9	20.8	18.3	60.9		
Kerala	43.0	19.9	12.9	24.1	31.7	16.3	10.3	41.6	43.0	18.8	29.9	8.3	49.8	22.3	27.9	40.5	23.4	36.1		
M.P.	9.8	20.9	24.9	44.4	10.1	18.0	21.1	50.8	11.8	20.6	21.0	46.6	14.7	24.5	60.8	14.3	25.6	60.1		
Maharashtra	11.4	13.3	22.3	53.0	12.2	12.0	16.6	59.2	10.5	16.8	17.5	55.2	16.3	20.5	63.2	18.4	22.0	59.60		
Orissa	47.4	25.5	17.7	9.4	38.6	22.1	20.7	18.6	25.4	18.9	47.2	8.5	26.6	10.3	63.1	22.5	14.8	62.6		
Punjab	3.2	6.0	20.2	70.6	3.1	5.7	17.8	73.5	3.8	10.2	14.8	71.2	5.9	9.1	85.0	2.2	8.6	89.2		
Rajasthan	6.4	14.7	18.0	60.9	12.2	14.3	16.7	56.9	31.2	13.7	18.0	37.1	37.6	10.4	52.0	8.9	24.0	67.1		
T. N.	19.9	13.7	14.9	51.3	24.3	18.7	12.4	44.6	32.5	16.8	9.4	41.2	36.6	19.1	44.3	30.6	28.8	40.6		
U.P.	12.2	17.0	15.1	55.6	11.6	15.4	11.7	61.3	18.9	20.2	16.5	44.4	20.7	16.5	62.8	23.8	25.2	51.0		
W.B.	18.7	29.2	16.7	35.4	19.5	32.3	15.0	33.2	24.8	33.9	12.1	29.2	57.5	14.4	30.0	35.0	11.6	53.5		
India	11.7	13.7	18.7	55.9	12.7	13.0	15.5	58.8	18.1	17.2	17.1	47.6	20.5	16.3	63.2	16.4	19.1	64.5		

Note: The original tables give the classes in acres; these are converted into hectares at the rate of 2.5 acres = 1 hectare.

Source: Report on Currency and Finance, Vol II, Reserve Bank of India, for relevant years.

Table 19. Overdues as Percentage of Annual Demand for Repayment of Term Loans and Short Term Loans by Commercial Banks, 1979-85.

States	Term Loans							Short Term Loan				
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
A. P.	71.8	57.7	59.7	55.3	53.3	50.8	43.6	42.8	41.5	40.1	41.1	39.4
Assam	65.0	78.6	76.9	75.9	69.3	60.5	86.4	75.7	69.7	62.1	55.8	80.5
Bihar	61.2	59.2	59.5	58.8	61.0	60.9	70.2	69.2	62.7	66.9	23.6	67.6
Gujarat	54.5	49.7	48.1	47.6	47.8	47.6	48.5	46.2	44.7	47.0	46.2	46.0
Haryana	36.6	43.0	45.7	41.8	43.7	41.9	26.3	33.3	35.9	33.7	35.8	36.1
H.P.	39.1	56.2	54.7	45.7	47.2	47.0	55.3	56.6	62.3	66.2	54.9	56.4
J. & K.	36.4	43.8	43.5	52.9	61.4	51.7	63.6	60.0	57.4	58.0	65.8	40.4
Karnataka	61.9	60.6	60.0	61.1	60.7	53.3	41.0	40.7	40.5	38.6	44.3	45.1
Kerala	44.3	41.8	43.5	50.7	48.1	49.6	42.7	26.9	30.4	26.6	25.2	22.6
M.P.	63.9	57.5	58.6	56.5	58.9	57.0	56.4	54.8	50.3	52.3	53.6	50.8
Maharashtra	67.1	64.0	63.8	64.3	63.1	61.1	44.1	38.3	42.2	42.2	49.0	46.5
Orissa	60.2	61.7	57.9	60.4	67.6	61.9	58.6	66.8	60.3	61.7	59.6	51.5
Punjab	20.6	25.1	31.0	28.2	40.2	31.9	17.6	21.0	22.8	22.3	36.5	23.0
Rajasthan	49.5	57.2	56.2	57.0	54.8	53.0	37.1	94.0	40.4	38.4	41.2	43.0
T. N.	59.9	56.6	53.1	54.5	50.0	46.3	41.9	36.2	37.7	36.5	38.1	32.9
U.P.	47.2	46.9	49.4	47.7	47.4	46.3	45.1	41.4	46.2	41.8	41.9	43.9
W.B.	72.9	76.7	80.8	76.0	74.3	69.8	64.8	64.4	65.6	67.2	58.6	63.6
Others	49.0	45.0	53.1	57.5	69.4	60.4	-	-	45.1	52.5	41.7	41.6
India	55.1	53.2	53.5	51.9	53.4	50.4	42.8	47.0	41.5	41.2	42.5	39.8

Source: Data supplied by NABARD.

Table 20. Overdues as Percentage of Annual Demand for Repayment of Loans by PACS 1972-85, and By RRBs 1982-84

State	Loans by RRBs				Short and Medium Term Loans by PACS															
	1982-83	1983-84	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85					
A. P.	49.3	40.3	51.3	40.1	40.1	37.8	33.8	36.5	37.8	48.0	45.3	42.2	36.3	38.2	55.7					
Assam	42.2	44.2	89.5	89.5	89.5	n.a.	88.7	89.8	81.3	85.9	82.4	38.9	94.6	91.3	91.3					
Bihar	50.1	52.6	55.9	55.9	64.8	59.1	68.4	68.4	63.6	63.6	51.4	82.4	74.8	63.0	63.2					
Gujarat	38.7	37.3	22.5	25.3	26.8	38.6	43.4	42.6	40.9	47.4	47.9	45.7	32.6	33.1	33.3					
Haryana	45.0	46.5	34.2	30.9	34.8	27.9	30.2	29.8	27.0	30.4	31.5	30.9	30.2	35.4	36.3					
H.P.	60.0	51.4	37.6	42.8	39.5	41.1	47.1	45.1	45.6	44.1	41.4	40.9	40.9	35.1	36.4					
J. & K.	52.4	62.0	35.4	35.4	35.4	n.a.	50.7	53.9	58.9	55.5	52.0	52.0	52.6	n.a.	30.1					
Karnataka	37.3	43.2	44.9	40.2	39.2	38.6	42.1	47.2	46.7	48.5	50.8	45.2	37.6	39.8	41.6					
Kerala	27.1	31.2	30.4	30.4	32.7	32.5	31.7	27.6	25.8	23.4	21.0	50.8	21.8	20.0	20.7					
M.P.	56.0	54.6	48.5	52.5	51.5	50.5	58.0	57.2	54.2	56.5	45.5	53.1	43.6	49.2	45.1					
Maharashtra	54.9	61.6	18.3	36.0	41.9	39.9	45.9	55.0	52.8	53.4	42.7	51.2	38.5	48.5	44.6					
Orissa	56.1	60.8	62.6	64.5	60.0	57.8	56.4	51.7	50.6	45.2	40.1	66.4	41.3	47.4	47.5					
Punjab	n.a.	10.0	34.1	38.5	34.0	37.3	39.8	27.9	25.5	28.0	19.8	19.8	19.8	36.4	14.8					
Rajasthan	50.1	53.0	48.0	41.3	40.1	26.3	39.4	42.9	43.5	48.0	39.0	38.9	38.3	41.5	47.1					
T. N.	41.4	61.2	25.5	25.5	27.9	29.6	27.9	35.3	51.4	76.7	38.0	18.6	55.2	55.0	57.9					
U.P.	53.0	55.5	49.9	50.2	53.6	40.3	47.1	46.1	44.9	46.3	47.0	40.2	50.4	46.3	50.6					
W.B.	61.5	62.0	60.8	47.6	37.2	38.4	28.7	45.7	49.0	59.7	61.3	41.4	69.0	70.1	60.8					
Others	46.6	53.4	44.4	61.2	40.5	37.8	63.4	64.4	64.4	75.5	70.1	68.7	68.0	87.2	69.8					
India	47.8	49.9	36.1	39.4	40.3	39.3	42.9	44.4	43.9	48.7	40.7	41.9	40.0	43.1	42.2					

Source: Data supplied by NABARD.

Table 21. Overdues as Percentage of Annual Demand for Repayment of Term Loans by LDBS, 1972-85

States	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
A. P.	19.4	10.3	9.2	8.6	9.8	19.0	24.3	17.9	37.7	36.9	45.4	43.6	43.6
Assam	71.4	75.0	66.7	50.0	38.1	36.0	44.1	65.2	63.2	68.6	84.8	63.4	63.4
Bihar	42.3	33.6	33.6	34.8	58.0	60.8	59.5	76.7	25.8	45.9	59.6	58.0	44.9
Gujarat	61.3	45.4	72.1	56.3	63.2	68.7	71.6	79.1	76.0	58.1	71.4	68.7	72.5
Haryana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	1.5	1.3
H.P.	84.4	56.1	58.7	51.1	63.8	57.6	75.3	61.7	49.0	47.4	47.6	27.4	37.5
J. & K.	31.3	32.6	32.7	38.1	47.5	38.4	47.9	58.2	47.6	45.6	55.9	51.4	51.4
Karnataka	32.9	13.7	20.1	25.4	40.2	39.5	42.1	47.4	49.9	44.1	37.2	41.6	38.3
Kerala	36.3	22.3	20.5	12.4	8.3	4.9	6.9	5.9	3.1	5.7	7.9	10.1	12.8
M.P.	28.1	25.6	24.4	22.5	40.0	44.9	42.1	60.1	44.0	50.3	6.3	62.5	55.7
Maharashtra	84.7	44.5	58.5	60.5	62.8	57.6	19.4	52.4	65.3	41.9	44.5	49.4	43.9
Orissa	88.7	61.2	57.4	57.4	59.9	40.0	43.3	54.8	34.8	53.9	64.0	27.5	61.0
Punjab	3.7	5.0	1.4	2.6	8.5	2.8	2.2	2.7	1.0	1.6	0.5	30.6	4.5
Rajasthan	48.2	41.3	45.5	20.1	27.6	30.8	25.3	17.7	25.5	24.3	28.4	31.8	47.8
T. N.	5.7	4.0	9.8	17.7	36.0	64.7	80.0	88.3	80.6	62.1	81.2	62.1	69.9
U.P.	25.4	22.7	25.4	25.4	23.9	26.7	27.7	24.8	29.7	33.9	33.9	28.1	26.1
W.B.	41.1	19.9	19.9	0.7	0.9	7.9	21.4	37.1	52.0	66.0	61.4	49.9	53.2
Others	0.0	85.7	100.0	38.9	52.0	53.6	51.4	95.0	50.0	62.5	74.4	-	42.0
India	45.4	27.9	36.5	34.4	39.8	43.4	41.5	50.0	47.8	39.7	43.7	43.5	42.8

Source: Data supplied by NABARD.

## CURRENT INFLATION

Nilakantha Rath\*

*This brief paper traces the changes in the Consumer Price Index for Industrial Workers since 1991 till May 2008, and draws attention to the fact that the inflation during the last two and half years has not been as high as in most of the years in the 1990s, nor has it been higher during the first five months of this year compared to the same period in the previous two years. It lists the trend in per capita availability of foodgrains during the last two decades to suggest that its trend influences the price level. It discusses broadly the food and crude oil situation and suggests that the trend in the price of the latter is irreversible and the economy should be reoriented to take care of this.*

The announcement that the inflation index has reached nearly 11.8 percent rise in the latest week over the level a year ago has excited political parties. People and parties are worried when they hear that the inflation index has topped its 13-year record.

The ordinary urban householder, however, appears rather confused. Her/his experience in course of household purchases does not quite give the impression of such sharp and rather sudden price rise. She says that while prices are higher than what they were two-three years ago, except in case of edible oil there has not been such sharp rise in very recent months.

But, that is the impression of some urban consumers. What is the real situation so far as all the urban consumers are

concerned?

The inflation index (which in effect is the Wholesale Price Index) that is being put out every week, and makes headlines in the newspapers, is an index designed to measure the over-all inflation in the economy. That Index has heavy weightage of different types of minerals produced in the country, of cement, of steel, of manufactured intermediate products, of the services like IT, of different energy products, besides of foodgrains and other agricultural products and manufactured consumer goods. Such an index is useful to tell the manufacturers, industrial investors, producers of infrastructure products about the trend in prices in the economy.

But, this index does not, and can not, give a correct picture of the trend in prices

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[Editor's Note: The present article on current inflation specifically analyses the price behaviour in the recent period up to 2008, and is of current topical interest. We are, therefore including it in the present-October-December 2006 -issue of the Journal, the publication of which has been delayed.

relevant to the price situation faced by the householders. Steel, cement, minerals, intermediate producer goods have no direct impact on the prices that the consumer has to pay for the various commodities and services she buys routinely. Those prices may have an impact over a longer period in an indirect way, like slowly rising house rents due to increased cost of cement and steel in the construction of new houses.

The price index that would indicate the changing price situation faced by the consumer from week to week, month to month, is indicated in our country by three different consumer price indices routinely put out by the Labour Bureau of the Government of India. They are: (i) the Consumer Price Index (CPI-IW) for Industrial Workers; (ii) the Consumer Price Index for Agricultural Labour (CPI-AL); (iii) the Consumer Price Index for Rural Labour (CPI-RL). These three different indices naturally do not show the same price change from month to month. But, their trends are similar. Of course, since foodgrains have a heavier weightage in the family expenditure of the Agricultural Labour and also of the Rural Labour, their Index would move faster or slower than that of the CPI-IW, depending on the way the food price index changes over time. So, to avoid cluttering this article with too many

indices, we shall use only the CPI for industrial workers, which is currently the most widely used index for most relevant policy purposes in the country.

1. The first fact to notice is that this CPI-IW for India recorded a 6.2 and 6.7 percent increase during 2006 and 2007, respectively, over the annual average price index of the preceding year in each case. The average CPI for the first five months of this year (2008) has registered a 6.9 percent rise over the average index for the first five months of 2007. The price index for these five months in 2007 had also registered a 6.9 per cent rise over the average price index for the first five months of 2006. Even the indices for the month to corresponding-month of the preceding year for the months of March, April and May of this year were 7.9 percent only. This is much lower than the rise in the Inflation Index for the entire economy being put out routinely in newspapers. It also does not show that till the end of May 2008 the inflation index for the CPI-IW had risen any faster than what had happened in the preceding two years.

**Table: Consumer Price Index for Industrial Workers in India (1982 = 100)**

Year	Index	% rise over pre- ceding year
(1)	(2)	(3)
1990	186	8.8
1991	212	14.0
1992	237	11.8
1993	252	6.3
1994	278	10.3
1995	306	10.1
1996	334	9.1
1997	358	7.2
1998	405	13.1
1999	424	4.7
2000	441	4.0
2001	458	3.9
2002	477	4.1
2003	496	4.0
2004	514	3.6
2005	536	4.3
2006*	569	6.2
2007*	607	6.7
2008**	633	6.9

Source: Index data from the Labour Bureau, Government of India.

Note: \* These are the new Indices, with 2001 = 100, multiplied by the factor of 4.63 to link them to the 1982 based Index.

\*\* This is the average index for the first 5 months of 2008, and the percentage change in over the average of the first 5 months of 2007.

2. It is also interesting to note is that the rise during the last two years as well as during the first five months of 2008, for which CPI-IW data have been put out, is much lower than the rise in the price index for the Industrial Workers (CPI-IW) during the years 1990 to 1998.

During these nine years, the average annual CPI-IW had risen by 9 to 14 per cent, except in the two years, 1993 and 1997, when it had increased by 6.3 and 7.2 percents, respectively. In fact, the years in the 1990s, except for 1999, were years of high inflation for the urban as well as rural consumers, much higher than what is recorded for the last two and half years.

3. During these nine years, the month to twelve-previous-month rise in the (CPI-IW) index was very high in the years 1991 and 1998 - between 14 to nearly 20 per cent for large parts of these two years.
4. During the seven years after 1998, till 2005, the average annual CPI increased between 3.6 and 4.7 per cent. These were years of comparatively low inflation from the consumers' point of view.

The inflation rate for the urban consumers during the last two and a half years, and specifically in the last five months, has not been as high as during the 1990s, about 50 per cent higher than in the seven years since 1999, and has shown only an almost unchanging rate of increase during the last two and half years.

It is surprising that the PMO, the Finance Ministry, the Planning Commission as well as the AICC office have never even by mistake brought this to the attention of the public as well as of the media. This is an election year and it should be of interest to the party or parties in power! In any event, it would correct the impression that the ordinary citizen is getting about the scale of inflation at present, and its psychological implications.

What has led to this increase in inflation during the last two and half years? Currently, there is a mention of two reasons: One, the food price situation, and two, the crude oil price. Let us look at these two, one by one.

- (i) Per capita availability of foodgrains (cereals + pulses) has shown a steady mild declining trend during the 21 years since 1986. Per capita availability is calculated by the Union Agricultural Ministry by taking the total production of foodgrains during the year and adding to it the net change in export/import and the net change in stock with the Food Corporation of India, and then dividing the amount by the estimated population of India in that year. It is necessary to remember that this availability figure does not take into account the changes in stock with the trade and

private households. The availability includes the quantity consumed by individuals and households at home and outside, and the amount fed to poultry and livestock and the amount used for non-food, non-feed purposes. While the trend is declining - the average annual decline has been a little less than 2 grams or about 40 grams per capita per day and about 0.4 percent per year - the per capita availability has been lower than the trend value in the last three-four years. This is likely to be the reason for the greater rise in food prices since the end of 2005. The CPI-IW shows that the rate of increase in that index depends largely on the price index of the food component in it. When the increase in the CPI-IW is high, the rise in the food component of that index is higher than that of the total, and when the CPI rises less, the rise in the index of the food component is less than of the over-all index. Thus, the rise in the price index of the consumer is mainly due to the rise in the food prices. The declining trend in the per capita availability of foodgrains is sure to result in a pressure on the prices of foodgrains and food in general. The sharper the decline in availability, the greater will be the rise in prices of foodgrains and food



- articles. [Parenthetically, it is surprising that when the USA administration, beginning with its President, says that the world food price rise is because Indians and Chinese are eating more, the Deputy Chairman of our Planning Commission says: what is wrong for a poor country eating more, with growing income! This is counter to the fact of declining per capita availability of foodgrain in the country. He seems to be shy to own up that our people are consuming less over the years.]
- (ii) The price situation becomes worse if, during the period of declining trend in foodgrain availability, the average per capita real income of the people continues to rise. This is what has been happening during the last one and half decades. Of course, the fluctuation in per capita real income from year to year has been some what higher than in the availability of foodgrains. But, it should be obvious that with rising trend in per capita real income and declining per capita availability of foodgrains, the price of food, and therefore of the CPI, will continue to rise. The rise will be higher in years when the availability declines more than the trend line indicates, with the per capita income rising more than the trend in it. This is what has happened during the last few years.
- (iii) While availability is in physical terms and per capita income is measured here in real terms (that is, excluding from it the pure monetary element), the price in the market is also influenced by monetary factors. If people have more money in hand against an unchanging or small changing real availability of goods, then its market price will rise. In India the total supply of money has increased faster than what is appropriate for an economy growing at the rate ours is growing. One reason for this has been the conversion of the large amount of dollars being brought into the country by outsiders for business purposes. These dollars are converted in to rupees and this increased currency supply goes to inflate the total money supply in the economy. This larger money, in the hands of individuals and institutions, is used to purchase goods and services in the economy, the supply of which has not been increasing at the rate at which this monetary demand is increasing. The result is the rise in prices of goods and services. Naturally, the demand for,

and therefore the prices of, minerals, metals, cement and intermediate producer goods are increasing faster than that of foodgrains, thanks to the very skewed income distribution in our economy. One way the Reserve Bank of India can check this rise in money supply is by withdrawing rupees from circulation in the economy. In recent years the increased supply of dollars and consequently the increased demand for rupees led to a decline in the price of dollar in terms of the rupee. This made imported goods cheaper in India and exported goods from India dearer abroad, adversely affecting our exports. But, the Reserve Bank did not intervene to control the supply of rupee since our import of crude oil was becoming cheaper in rupee terms at home. But, at the same time, it contributed to an across the board rise in prices of commodities. If the Reserve Bank were to withdraw the rupees from circulation, this can lead to a contraction in money supply. Of course, it will make dollars more expensive and lead to higher prices of imports, mainly oil.

- (iv) We do not have free international trade in most agricultural commodities produced or demanded in our

country. But, we export as well as import many agricultural commodities, particularly commodities featuring in consumer demand, like edible oil and pulses, and occasionally wheat, and export limited quantity of rice. When there is domestic shortage of any of these, we tend to increase import and or restrict export. Edible oils and pulses are being routinely imported. But, during the last two years, and particularly during the last six months, prices of oils and oil seeds as well as of cereals have very significantly increased in the international market. The reasons are two-fold: Firstly, due to very adverse seasonal condition, major wheat and soybean producing countries, like Argentina and Australia have suffered massive decline in production. These countries being the major suppliers in the international market, the prices of these commodities have gone up. Secondly, due to rising world price of crude oil and its products, many developed countries have adopted policies to encourage use of some cereals and oilseeds for production of ethanol - a diesel substitute. USA is in the forefront of this. The result has been diversion of corn and soybean to ethanol production, raising price of these commodities

for food. This has resulted in the price of edible oil and wheat and corn and even rice in the international market rising very steeply. Our economy can not be entirely free from the influence of this international price rise, since we import significant amounts of these for our use.

- (v) Now, turning to oil, crude oil price has risen phenomenally in recent months. This has affected the cost of our crude oil imports. Our government has been making its own oil importing companies suffer loss in order to protect our consumers. But, this is an unsustainable effort. So, diesel and petrol prices have risen and must rise. It has and will have impact on costs of production of different commodities, like gas, fertilizer, electricity, all types of synthetic products, including even medicines, besides, of course, transport costs.

It is necessary to note that the circumstances leading to the rise in the prices of food articles and in crude oil-based products are not identical. The loss of crops due to adverse weather is not a perennial situation. The weather will improve and to that extent supply situation will also improve, bringing some relief in the food price front. In the

long run, varietal improvement, better and more economic use of irrigation water, and use of green manures and bio-fertilizers can lead to greater areas under irrigation, better and less costly production of crops. Thanks to cheap chemical fertilizers - all oil-based, the use as well as development of the organic substitutes have been neglected. The point to recognize is, there is scope for long term increase in supply of agricultural products.

But, that can not be said about crude oil. This is a mineral that is ultimately exhaustible. Right now there is a serious debate the world over about whether the production of oil has reached its peak, meaning the daily or annual production in the world cannot increase any more. And, once that level is reached, the next phase is the decline in total production and availability. Important sources of mineral oil have already registered decline, like the north-sea oil. Trying to increase the rate of daily extraction from known and abundant sources, like the wells in Saudi Arabia, will prove to be far more expensive. This can be done only if the price of crude oil is much higher; and this in turn will lead to faster decline in the reserve there. New sources, like the newly discovered vast reserves in the Amazon off-shore in Brazil, will require very expensive, special types of drilling equipment to extract oil from very deep

in the underground. So, only higher price can justify that effort. The important point is, unlike the rise in food prices, the rise in oil price is irreversible. (The fluctuations around the rising trend, due to a variety of local reasons, like strike in Nigeria, or speculation about a war in west Asia, should not distract us from the irreversible rising trend in the price of oil). The world will have to redesign its economy to accommodate to this more costly material. Oil price can come down in the very long run when the world economy has found alternative economic sources of energy. The present high price of oil can only be a triggering factor for intense efforts in this direction.

For the Indian economy, the Reserve Bank can and should take measures to control money supply. The Indian and state governments should take steps to distribute irrigation water more economically and rationally, should push

scientific research for better varieties of crops, and should propagate use of green manures, organic manures like composted dung and night-soil, and bio-fertilizers. And, it should adopt a rational policy about oil and chemical fertilizers, such that the unsustainable policy of huge subsidy is gradually given up. This will persuade farmers to try alternatives, which in turn will require more economic supply and use of irrigation water. The unhealthy and dangerous urban transport scene can fortunately change for the better if motor fuel price is permitted to reflect the changing international relative price situation. In fact, in this context, the government was unwise in not raising the price of petroleum, diesel and gas during the last four years, as and when the international price of these increased. Sudden sharp increase at long interval is undesirable and harmful. The economy should be gradually prepared for a regime of high price of oil and oil products.

# THE CO-OPERATIVE IS DYING, BUT THE CO-OPERATIVE MUST BE REBORN

Nilakantha Rath

*The redesigned rural co-operative credit institutions started in 1956 with massive state help, since rural savings were inadequate to meet the needs of planned rural development. But, as agriculture developed in different regions, the approach to rural co-operative credit institutions did not change to meet the new emerging situations. The result: by now the co-operatives in most states are on their way to extinction. NABARD appears to have lost interest in co-operative credit institutions. It is time the co-operative credit institutions are reborn some what on the lines of the self-help co-operatives in Kazipeth and some adjacent districts of Andhra Pradesh.*

There are three different types of productive organisations in our society: the state-run enterprise, the private company or the joint stock company and the co-operative, besides the household and partnership units. During the last one and half decades there has been very considerable discussion on the first two types and on the reorganisation of these in the country. But, the third, the co-operative, which of course had the smallest share in the economic field in India, has received scant attention.

Fifty five years ago, in 1954, the Committee of Direction of the All-India Rural Credit Survey, (RCS) undertaken by the Reserve Bank of India, pronounced in its report that in India "Co-operation has failed, but co-operation must succeed". This reverberated through the corridors of the Reserve

Bank, the central and state government offices as well as in the public forums for a long time. But, at the end of half a century it appears that we have traveled a full circle and the time has come to say that "co-operatives are dying, but co-operatives must be reborn".

What made the Committee of Direction give such a slogan? It surely was not an ideological slogan. The Committee felt that the prevailing situation warranted it. What was the situation? This was the time of the first Five Year Plan. It was essentially an agricultural development plan. Large and medium irrigation projects were coming up in different parts of the country. These were going to - and were meant to - open up possibility of increasing agricultural production, through stability in moisture supply to agriculture, prolonged and intensive use

of agricultural land under different crops, and better - meaning more productive as well as pest resistant - seeds. The community development programme was designed, amongst other things, to help villagers produce large amounts of compost by greater and better use of the cattle dung, plant wastes as well as leaves from forests. Chemical fertilisers were coming into the field for the first time, with significant possibility. The possibility of increased agricultural production needed increased working capital with the cultivators to transform the technical possibility into actuality.

But, here was the hitch. The first Report on National Income of India, just published, had shown that the savings of households in rural India, including the monetary value of the family labour put in by the farm families on land development work, constituted about six per cent of the gross domestic production in rural India. This was considered woefully inadequate to meet the need of working capital and some fixed capital necessary to transform the technical possibility being created by the Plan into productive reality, besides of course meeting the credit needs for the consumption expenditures of the rural households. The funds had to come from outside the rural sector. There were no commercial banks with rural branches to do this. The Reserve Bank of India had, by the provision of the

law creating it, a special responsibility about agriculture and rural credit. At the time of the drafting of the RCS Report, it was being estimated that a sum of about nine hundred crore rupees a year would be necessary to finance the short term credit needs of agriculture. If the Reserve Bank were to provide this, what was the agency through which and the manner in which it could be done? The Committee of Direction discovered that the existing co-operatives, relatively few and far between, had not been able to do anything very much till then. The only other rural credit institution was the village money lender. There were discussions about the possibility of financing these money lenders who in their turn will provide the cultivators with loans for the purpose. But, the survey into the rural money lenders and the manner in which they operated in the villages created serious doubts about the suitability of this agency. Firstly, there were not many money lenders in each village. Besides the land owning cultivators who sometimes lent money to their tenants, there was on an average one money lender in a large village and none in the smaller ones. The money lenders were in a monopolistic situation. While they discriminated between borrowers, depending on their assessment of the credit worthiness of the borrower, their interest was not always pure money lending. If default in repayment was likely to lead to

foreclosure of the mortgaged land or sale of land to discharge the debt, this was often welcome to the money lender. Financing such an agent to extend vastly increased short term production loan to cultivators, without any control over the money lender's decisions and actions, was considered a difficult, dangerous and unhelpful policy choice. So, the idea was abandoned. The only alternative available as the co-operative credit society in the village. These had not worked too well till then. But, in the situation prevailing, this institution had to succeed, if credit was to be provided in vastly increased measure to the cultivators across the length and breadth of the country.

Having decided on using the village co-operative credit societies as the institutional agency for channeling credit, largely from outside, to the cultivators, the RCS Committee of Direction considered it inevitable for the Reserve Bank to ensure the proper assessment and disbursement of the loan amount, the rate of interest to be charged and the timing of repayment of the short term loans by the borrowers to the society and finally back to the basic lender. The co-operative laws in the states were suitably amended, and the Reserve Bank created a special agency, the Agricultural and Rural Development Corporation (ARDC), later

replaced by NABARD in 1983, to discharge the entire responsibility on its behalf. The state governments were to help in the creation of the societies where they did not exist and even financially help the small farmers and the landless labourers if they were unable to raise the minimum share capital for membership of the society.

In recent years some scholars and even committees (like the recent Vaidyanathan Committee on co-operatives) have blamed the Reserve Bank's Rural Credit Survey Committee of Direction for the state supported, aided, directed and controlled co-operative system prevalent in the country. I consider such criticism rather casual and misplaced. Such criticism does not pause to examine the situation which led the RCS Committee of Direction to suggest the primary co-operative structure. The Committee had not said that the above type of co-operative credit society recommended, to which objection has been raised, shall be the pattern in India for all times to come, a view many supporters, in states like Maharashtra, of this type of co-operatives hold and express. This type of rural credit structure during the second and third Five Year Plan periods greatly helped in sustained growth in agricultural production - rates of growth never seen till then. Of course, not every corner of rural India registered equally high growth

in agriculture. But where ever the cultivators' economic condition had improved significantly, it was necessary to change the pattern that had been designed for very different economic conditions (as stated above briefly). For example, Prof D. R. Gadgil, one of the three wise men that constituted the RCS's Committee of Direction, in an address in 1969 had advocated the co-operative credit societies in developed agricultural regions to move away from the pattern of standardised Kharif-Rabi loans and early recovery, and begin cash credit method for the members. As the first chairman of the Pravara Co-operative Sugar Factory, the first co-operative agricultural processing unit in the country, Prof Gadgil had persuaded a very reluctant Vaikunthabhai Mehta, the then Finance Minister of Bombay, to extend substantial loan to this factory, with the assurance that in less than ten years the society will have repaid the state government its entire loan and interest. In fact, the society repaid the state government as well as the Industrial Finance Corporation the entire loan with interest in seven years and had a substantial reserve fund by the time Prof. Gadgil retired from the Chairmanship of that co-operative at the end of ten years.

The trouble was that the frequent reviews of the working of the co-operative credit structure in the country

did not take such a view, but stuck to the original scheme, in spite of vast changes in many agricultural regions in the country. What is more, this state determined pattern, including the interest rate, along with vast funds as loans from outside, gradually created a class of rural leaders, who beginning as serious co-operators, eventually saw the great potentiality of this institutional and financial device as a powerful weapon for their political ambitions. A change in the established pattern would not be in their interest.

There was a policy of financing the societies if they used the funds to provide loans at stated rate of interest, which was always much lower than even the prevailing rates of interest on fixed deposits paid by the commercial banks which had expanded their branches in to rural areas after nationalisation in 1971. After 1994, the societies were freed by the Reserve Bank to charge their own rates of interest. But, the refinance from NABARD had the condition attached that the societies receiving money from it shall charge only the specified interest rate. This policy on interest rate over long period resulted in the societies having little deposit from their members. Even in prosperous agricultural regions, farmers put their surplus funds in commercial bank deposits, but borrowed from the society for their working capital needs. In a state like the



Punjab, deposits of members rarely exceeded forty per cent of the society's total advances. The Kerala example is very telling. With large flow of funds to the households from the gulf, the money was often deposited in village co-operative credit societies. The societies gave high interest on such deposits and lent the money to members at 4-5 per cent higher interest. But, these loans were given for non-agricultural purposes. For agricultural crop loans, however, the societies depended entirely on NABARD refinance. For, this was available at much lower rates, lower than the interest rates the societies paid on deposits by members. And, why not? Why would members pay a higher interest on crop loans when the money was available at much lower rates? The result was also equally telling. While repayment performance for the non-agricultural loans was more than 95 per cent, for agricultural loans it was never better than 60 per cent. The reason was, while the non-agricultural loans were from the members' own deposits, the agricultural loans were from NABARD money.

The point was: the stake of members in the funds advanced by the society as loans to members. If the stake was high, the sanction of loan as well as its repayment was closely supervised by members. If it was NABARD fund, the members had no stake in it and therefore

no proper supervision of such loans. How completely disinterested were members may be highlighted by a report of the loans of a society in a village, when the loans were recently written off by the government. The chairman of the society had taken loans for purchase of buffaloes, many in number, in the names of many individual members of the society, of course, in connivance with the secretary, without the knowledge of such members. He was getting worried about repayment, when by grace of government, bulk of the loans was written off! And all this without the knowledge of the members! This is an extreme case. But, it underlines the general lack of interest of members in the loan business of the society.

This has been further helped by the periodic writing off of loans to cultivators by the government. When the loans were written off in 1990, there was widespread resentment amongst those farmers who had already repaid their loans. The same was the situation now. It has led the Maharashtra state government to write off loans of all cultivators on the due date. Writing off loans, then and now, had two consequences. In the first place, the lender institution was not compensated by the government immediately. Consequently the loan stood in the name of the borrower till the compensation amount was received from the government. The bank or society could not advance fresh

credit to the person. Potential borrowers suffered for long, since banks and co-operatives were compensated by the government over periods extending up to seven years after 1990. The present situation threatens to repeat that experience. Secondly, farmers realised that non-repayment would not matter much, since loans will be periodically written off. In fact, writing off agricultural loans has been more frequent than twice; some states have also done this some time or the other. Under the circumstance of low interest rate, mostly external funds and periodic writing off of loans, is it any surprise that the rural co-operative credit societies have gradually declined!

Low interest rates had another consequence. Some borrowers never repaid loans, not because they had no money to repay, but loans for any purpose were not available from any other source at such interest rate. Then why repay? - Better use the money for any other purpose. This and other reasons for failure to repay lead to societies becoming ineligible for fresh credit from NABARD. Such a moribund society is also unable to provide any loan to eligible members. Some times NABARD relaxes this condition for the eligible members. But that is only temporary.

In the 1950s and 1960s the village co-operative credit societies and the co-operative land development banks were the only institutional sources of short, medium and long term rural/agricultural credit. With the nationalisation of commercial banks in 1969 and opening of rural branches by them, these banks became another source of rural credit. But, because of their limited reach and expensive staff, their business tended to be confined to the large farmers and to long terms loans with some associated short term credit. The bulk of the short term production credit was through the village co-operative societies. In the middle of the 1980s only about 2 per cent of rural farmers in India had any credit from the commercial banks, while the co-operatives provided loans to about a quarter of the cultivators in India.

Thanks to the decline in the co-operatives, the proportion of short term credit provided by the co-operatives has gradually shrunk. But, despite expanded business in the rural sector, the commercial banks have not been able to meet the target of priority sector lending fixed for them by the government and the RBI (18 per cent of total advances to the private sector). Therefore, the government/RBI thought of a way out of the moral and political problem by designing that the banks can put the shortfall of this targeted lending with NABARD, at 6 per

cent interest. NABARD in its turn can lend it to state governments to finance specific rural infra-structure projects. Such loans, with interest, would be repayable in five years. This appears to have been to the advantage of all: The banks are happy that they get six percent interest, without any effort, on the shortfall of the targeted amount. NABARD is happy that it does not have to do anything very much to invest this fund. The state governments come to NABARD with their project estimates for roads, bridges, small irrigation projects - flow as well as lift, and many others. No scrutiny is necessary. Once sanctioned NABARD has little to do. It has only one officer at the state headquarters to keep track of such loans and the progress of the works. At the end of five years the Reserve Bank of India, which helps state governments with their open market loans, deducts the amount due to NABARD from the loan proceeds and passes it to NABARD to clear the state's dues. And the state governments are happy, since, unlike present day loans from IBRD, and other foreign governments, no questions are asked. What a wonderful way of achieving the priority sector lending! It is thrice blessed!

It would have been instructive to examine the data relating to advances by the co-operatives and the commercial banks to agriculture in this context. A

little over twenty years ago, with the good offices of NABARD (in the Board of which I had just ceased to be a member), I obtained unpublished annual data on advances by commercial banks to agriculture from the RBI as well as the published data on advances by the co-operatives to agriculture till 1986, to write a paper on Rural Credit in India [Rath, 1989]. Therefore, when the Reserve Bank recently asked me to do an exercise on rural credit, I readily agreed. I requested my associates in the RBI to help me with the unpublished data on advances, short and long term, to agriculture by the commercial banks, since these data are never published by the RBI. I found that NABARD had stopped publishing the annual statistical volumes relating to co-operatives after 1997-98. So I sought the good offices of the RBI for the up-to-date data on that subject as well. After months of waiting I drew blank on both counts. So, as a last resort, I submitted an application to NABARD under the Right to Information Act for these data from 1998-99 to 2006-07. I received a CD containing the data up to 2001-02, without any mention of why the data for later years were not being supplied. I wrote to the higher authority of the Bank for the missing data or any reason for non-supply. I never received a reply" I gave up my effort to study the subject.

But, the result of subsequent attempt to examine the data relating to the co-operatives till 2001-02 was shocking: for six out of the fifteen major states (excluding Jammu & Kashmir) the total annual advance figures since 1995-96 or 1996-97 were absolutely unchanging. In case of some others, the figures were repeated for pairs of years. The number of households borrowing (in fact, these were borrowing accounts) were erratic, often ridiculously small. How could one use these data?

It became clear from this that NABARD had lost interest in collecting and reporting data on co-operatives since the beginning of this century. In fact, it appears to have lost interest much earlier. Otherwise, how would it go on printing unchanging figure for so many states year after year? The Reserve Bank of India, on its part, does not seem to care either, for this was its statutory duty, which had been passed on to NABARD on its creation.

The only other source of information about the situation in the recent past is the NSSO's sample survey in 2003. The investigation into the sources of outstanding loans, on the date of visit during the first half of 2003, of the agricultural households in rural India from different lenders shows that the cooperatives had ceased to be significant in most states,

except Gujarat and Maharashtra. The detailed data are presented in the Appendix table. In the country as a whole 48.6 per cent of the cultivator households were indebted. But about half of these indebted cultivators were indebted to the co-operatives (including the land development banks). The state-wise picture was, however, varied and depressing in many cases. In Andhra Pradesh while 82.9 per cent of the cultivators were indebted, only 20 per cent of the indebted were indebted to co-operatives. In some other states the figures were: Tamil Nadu 74.5 (33); Punjab 65.4 (38); Kerala 65.4 (46); Karnataka 61.6 (23). There were some others where the co-operatives hardly mattered or were of very small relevance: Assam 18.1 (3); Bihar 33 (4); Jammu & Kashmir 31.8 (1); Jharkhand 20.9 (0); U.P. 40.3 (13); Rajasthan 52.4 (15); Uttarakhand 7.2 (17); West Bengal 50.1 (19). The situation is even worse if we look at the borrowing from the co-operatives compared to the total borrowing for current farm expenditure. (Since the bulk of the borrowings from co-operatives are for current farm expenditure, we try that comparison). In Andhra Pradesh, while total borrowings from the co-operatives constituted only 10.4 per cent of the cultivators' total outstanding debt, their borrowings for current farm expenditure constituted 38.1 per cent of their total debt. In some other states, by 2003 co-operatives hardly

mattered. In the states of Assam, Bihar, J&K, Jharkhand, Rajasthan, Uttar Pradesh and Uttarakhand the borrowing from co-operatives constituted between 0.2 to 6.7 per cent of the total borrowings of the cultivators as also a very small part of the total borrowings for current farm expenditures. In the states of Himachal Pradesh, Karnataka, Madhya Pradesh, Punjab, Orissa and West Bengal the borrowings from co-operatives constituted between 1 to 20 per cent of the total borrowings while in these states current farm expenses constituted much larger proportions of the total borrowings. Only the two states of Maharashtra and Gujarat showed high proportion of borrowings from the co-operatives (48.5 and 41.8 per cents, respectively), thanks to the co-operative processing and marketing units in sugar and milk in these states. In almost all states the commercial banks were more important than the co-operatives.

It is clear that the rural co-operative credit institutions, which constitute the bulk of the cooperative institutions in the country, are slowly and perceptively dying. T. S. Eliot's lines fit it very appropriately: "This is the way the world ends, this is the way the world ends, not with a bang but a whimper".

The institutions that appear to have occupied NABARD's interest in the 1990s and much more so during the recent years are the Self-Help Groups (SHGs). These are thrift and saving associations of rural and urban poor women (sometimes of men too), numbering about two dozen in each. They routinely pool a small part of their daily wages, every day or every week, with a literate amongst them keeping account. The money is deposited in the nearest branch of a commercial bank. Once the savings become significant, they give loans out of it to their own members for urgent family needs, like sickness, death, education of a child, occasionally wedding of a daughter, etc. Sometimes if a member thinks she can start some business, like a tea stall near a bus stop or buy a goat or two, they give her a loan for the purpose. The members decide on the amount that is needed as well as the amount that can be properly advanced and repaid, and they keep an eye on the member's repayment performance. Every loan is, in this way, properly supervised. The most common interest rate charged by the SHGs in India is two paise a rupee a month, that is, about 25 percent a year.

Many voluntary agencies working in the field (now called NGOs - non-government organisations) helped these SHGs in getting organised, keeping accounts and opening bank accounts.

NABARD also helped such groups in some states. Not every NGO was equally helpful, leading to the decline of some SHGs. However, the main characteristic of these SHGs was that they operated with their own savings. The responsible work of these small SHGs made NABARD look at them as potentially useful organisations to help with supplementary loan funds at low interest rates. The state governments also came in with subsidies. Commercial banks were persuaded to help them with loans, which NABARD refinanced.

During the last decade or more, the SHGs have become extensive and the commercial banks and NABARD have become very much involved in them. The manner of working of an SHG is exactly like that of a classic co-operative. But, these are never registered as co-operative societies. For, in India, more than one co-operative credit society per village is not permitted by the state government. But, more importantly, the SHGs and their helpers, the NGOs, did not wish to be anywhere near the legal co-operative set up, such is the fright of the villagers about a co-operative today. In fact, the SHGs have no legal, that is, statutory status. They are only permitted to open bank accounts in their name, as per the Reserve Bank's guide-line to the banks.

The enthusiasm of the banks, the state governments and NABARD in promoting, advancing loans and subsidising the SHGs reminds one of the early days of the primary co-operative credit societies in the villages. The banks are anxious to lend up to four times the amount of deposits that an SHG has with them. And the state government is anxious to give a subsidy of fifty thousand rupees to an SHG that takes loan to this extent from the bank. When a year ago this author was with an NGO in the Nuapada district in western Orissa, he was told that commercial bank people had been repeatedly visiting them and the SHGs sponsored by them to persuade them to take loans of such magnitude, which will lead to the state government giving each SHG a subsidy of fifty thousand rupees. This will be credited to the SHG's account, but released to it as soon as the loan to the bank is repaid. The SHGs had been hesitating since they did not know what to do with such large loan from the banks. This author's experience in this connection in Warangal district of Andhra Pradesh is more instructive. He was visiting a large Thrift and Credit Society (registered under the Mutually-aided Co-operative Societies Act, 1995, of Andhra Pradesh). This society had more than three hundred female members. It operated with the share money and deposits of its own members, and had no

connection for loans with any co-operative or commercial bank. In course of discussion, the question was raised: why the Society had not sought any loans from a commercial bank to finance the productive credit needs of the members. He was told by all the members present that they did not wish to have any business with a commercial bank. In this context they mentioned about the SHG business in their village. They said that the commercial banks were anxious to advance loans up to four times the deposits of the SHG and a state government subsidy of fifty thousand rupees. They said some members asked why they should not float small SHGs (the state governments require an SHG to have between 15 to 25 members) to collect the subsidies. But, most of the members of the society were unwilling. So, some 15 of them (one of them was present in the meeting) decided to form an SHG. They deposited their routine savings in the branch of a commercial bank. At the end of the year, the bank came forward to advance them loans up to four times the deposit at a low rate of interest. Simultaneously, the subsidy of fifty thousand rupees from the state government was kept in the SHG's account, to be released when the bank loan is repaid. At the end of a year the members repaid the bank the loan with interest, collected the subsidy of fifty thousand rupees and closed the

bank account! Such cleverness possibly comes out of long association with a working society like theirs.

Like in the early years of the primary co-operative credit societies, the many SHGs availing such bank loans would be feeling happy, as would their banks. But, like in case of the co-operatives, a time will come when the members finding so much loaned fund in which they have no stake, will gradually cease to be interested in careful supervision of the loans and their repayment. That will be the beginning of the end of the SHGs, as it has been with the primary co-operative credit societies. In their great desire to help the poor with large and cheap loans, NABARD and the commercial banks would have promoted the demise of such self-help groups.

The steadily declining primary co-operative credit societies and a similar prospect for the self-help groups, lead one to think of a proper approach to the organisation of co-operatives in India. The basic characteristics of a co-operative should be as follows:

- (1) A co-operative is essentially a users' organisation, in which the members come together to discharge a function which they think they can do together to every member's economic benefit.

Therefore, a co-operative should handle the business of only its members. Handling the business of non-members detracts from the co-operative character of the enterprise. In India, the bulk of transactions of most consumer co-operative stores is with non-members. The surplus plus dividend is distributed only to share holders. What is the difference of such a shop from a large partnership shop? The non-members should be quickly made members or not allowed to do business with the shop. Nominal membership - a category so common in the urban co-operative banks in India - is an anathema. In fact, a co-operative bank is a misnomer. A bank by definition is an organisation that accepts people's deposits and gives loans, without any restrictions, while a co-operative is an institution servicing its members only. The bulk of the deposits of the urban co-operative banks come from non-members. These days one reads advertisements in newspapers by urban co-operative credit societies inviting term deposits from any one, at high rates of interest. These are contrary to the basic co-operative principle. The urban co-operative banks should

function as regular commercial banks, not as co-operatives. What is more, if a share holding member, for whatever reason, ceases to carry on the stipulated business through his society, he should cease to be a member. In many older co-operative sugar factories there are many members who have ceased to supply sugarcane to the co-operative's mill, but continue as shareholders and vote in meetings and receive dividend. In fact, they have no business to be in the co-operative and their share capital should be returned to them. Any specified minimum number of persons should be able to form a co-operative society for a specific service to its members. Today, by administrative decision, a village can have only one registered co-operative credit society. We know that many villagers are denied credit facility if they are not owner-cultivators. Even when by political decision they become minimum share holding members, they never receive any loans. In the context of the present day trend of self-help groups of poor villagers, this policy should be abandoned and any number of co-operative should be permitted. Since a co-operative is a users' body, the state



government or any other organisation can not be shareholder in it, unless it uses the co-operative for its business in this connection.

- (2) One thing - many think the only thing - that distinguishes a co-operative from a joint-stock company is that there is provision of one member, one vote in a co-operative. This is a very old practice and co-operators consider this almost sacred for a co-operative. But, an alternative basis for voting in a co-operative would be more consistent with its basic approach. A co-operative is not a constitutional body of citizens. It is a business organisation of its members. The voting for all decisions relating to management in such an organisation should be on the basis of patronage by the member in the business of the cooperative. For example, in a marketing co-operative society for any particular commodity, the voting by members should be on the basis of the share of the member in the total quantity of the commodity marketed by the society, not on his share holding. Since the quantity marketed by a member might change from year to

year, it may be convenient to calculate the two or three year moving average of such patronage to fix the vote share of a member every year. In a co-operative credit society, the voting should be on the basis of the average monthly deposit by the member plus the average monthly repayment actually made by the member during the year. The reason for this is the stake of the member in the working of the co-operative. In this connection, one may mention the pattern of voting in the informal co-operative lift irrigation societies in Mehsana district of Gujarat, reported in a study by IRMA many years ago. In these societies, which had not been registered as co-operatives, the voting was on the basis of the area of land of the member irrigated by the lift. When asked why they did this, the member-farmers invariably stated that the member who has the highest stake in the working of the lift is best set to be the chairman. When the pump is damaged, he as the biggest loser takes tremendous trouble to see that it is repaired at the fastest. This principle should be stated as an alternative to the one man, one vote provision of the present day, for the co-operatives to choose from.

- (3) The surplus of the society, calculated after deducting the cost from the proceeds and after providing for losses and risks, should be distributed amongst the members in its entirety. Today the surplus, after providing for a reserve fund, is first distributed partly as dividend to shareholders and the remainder to the members on the basis of their contribution to the total business. This is not desirable. The surplus should be distributed on the basis of the patronage of the member plus his contribution to the share capital. This implies a uniform rate of return on both the share as well as patronage. Contribution to a reserve fund should be voted by members in the general body meeting, to be deducted from their receipts, and should not be decided by the Board of Directors ahead of the surplus calculation. In many successful co-operatives one finds contributions to the corpus of other organisations deducted from the Society's surplus, may be on the basis of a vote by members. This does not appear right. This matter can be brought up in the general body meeting; but the contribution by members should be on their own personal decision and not on majority vote. The co-operative shall have no such institution of its own. If the co-operative distributes its surplus in this manner, it can not, logically, be subjected to company income tax; for the co-operative has no income of its own. It is merely an agent of the members in the discharge of their common economic function.
- (4) The primary co-operative credit societies should be entirely free to fix the rate of interest they pay to their members on their deposits and charge their members on the loans advanced. The rules of the society should lay down that loans from any external financial agency to supplement the own funds of the society for advance to members shall not be more than half the total annual advances by the society. Specification of interest rate by the external financial agency on loans to be advanced should be a matter to be negotiated such that a low rate of interest does not undermine the long term interest of the society. This is absolutely necessary since it is the violation of this basic principle that has led to the decay and gradual demise of the rural co-operative credit institution. The co-operative society shall not be obliged to be a member of any two-

or three-tier structure as at present. It would be free to have dealings with any other financial institution, if it so chooses.

by the firm. With the same cost conditions, a co-operative firm has to be smaller than a total profit maximising firm.

It might appear that such a set of principles would make the co-operatives small institutions, with little scope for expansion. However, that possibility need not be a handicap for the co-operative. The first point to note is that the co-operative, as a users' body, has a different maximisation principle than a company or a private enterprise unit. An individual firm's objective is the maximisation of its total profit or producer's surplus. This, in terms of micro-economic logic, is reached at that level of its total output where the marginal cost is equal to the price of the product in the market, assuming that the company is operating in a competitive market. But in case of a co-operative, the goal of each member is to receive the best return per unit of the output it transacts through the co-operative. This, in case of the co-operative firm, is reached when the average cost of production of the firm is at its lowest. In that case the difference between the average cost of production per unit and the market price is the highest. And, the corresponding level of total output is lower than the level at which the marginal cost is equal to the price - the level of maximisation of profit

While the absolute size of a co-operative enterprise can not be specified in advance, it is reasonable to think that a very large co-operative enterprise, spread over the state or the nation, can not be a very profitable enterprise for its members. Due to inadequate supervision by its members, it unavoidably will turn out, in the best of circumstances, to be like a joint-stock company. Then, why not work as a joint stock company, why as a co-operative?

These specifications about the organisation of the co-operative, particularly the credit societies, might lead some to think that these can not function, particularly in our rural economic condition. Instead of speculating on possibilities, attention may be drawn to some Thrift and Credit Co-operatives in Andhra Pradesh working for more than a decade under the Mutually Aided Co-operative Societies Act of 1995. There are some 550 such thrift and credit societies registered under this Act in Warangal and two other adjacent districts of Andhra. Most of these are women's societies. Like the one mentioned earlier, they all have been working with their own funds. They

sanction loans to their members up to a maximum of four times the member's total deposits, subject to the underwriting by three other (unrelated) fellow members. The societies pay regular interest on the share contributions as well as on the deposits of members with the society. These are not fixed, but vary depending on the earnings of the society during the year. The sanction of loans as well as disbursement and repayment of loans are supervised by the members. Groups of 30 societies have formed their own common funds, in which the surplus of any society is deposited and from which any society requiring loans is provided. The total business of these societies runs into more than one and half crore rupees. The societies have so far never gone to any outside financial institution or government for loans. Since they have no district central co-operative bank of their own, NABARD does not come their way; possibly they also would not touch NABARD. Some of these societies have started their own life insurance scheme for their members. The working of these societies needs careful study. For the present, it is enough to suggest that such credit societies can function and function well in our rural setting.

In the context of our dying co-operative credit structure its rebirth in these terms is both possible and desirable.

Our rural economy today is characterised by growing number and proportion of small and marginal farms. More than three-fourths of the cultivated holdings in India are of less than one hectare in area, and account for about half the total cultivated land. The total number of farms in many regions has ceased to grow and has led to growing marginalisation and casualisation of the rural work force. This work force today is growing faster than the number of cultivators and agricultural wage labour taken together. In such a scenario, the type of co-operative credit institution that can survive and service its members is the type under the new Andhra Act, operating in Warangal area, on the principles enunciated above. They will give timely financial help and strength to the households and promote careful planning and husbanding of their financial resources. They may not succeed in converting all or most such households into independent entrepreneurs - a goal many financiers of self-help groups specify. But does it really matter? With Cardinal Newman they and we would like to sing: I do not want to see the distant scene, / One step enough for me. The primary responsibility of turning these people into more productive agents in other types of organisations is the responsibility of the state, directly and indirectly, not that of such co-operatives and self-help groups. Such co-operatives will also be a very useful training ground for our rural citizens to run their village

Panchayats in a meaningful way. This is the way the co-operatives can be and should be reborn to help the poor and indigent villagers as well as the more enterprising cultivators.

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#### Appendix: Cultivators' Indebtedness in 2003

Sr.	States	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Andhra Pradesh	82.9	51	26	20	38.1	23.4	10.4
2	Assam	18.1	12	11	3	6.7	16.6	2.7
3	Bihar	33.0	12	21	4	8.6	30.8	2.5
4	Chhatisgarh	40.2	42	27	37	30.0	40.3	20.6
5	Gujarat	51.9	56	13	40	50.3	20.3	41.8
6	Haryana	53.1	35	32	44	20.2	36.0	23.9
7	Himachal Pradesh	33.4	11	14	24	10.1	9.4	11.6
8	J&K	31.8	1	4	1	3.2	26.0	0.2
9	Jharkhand	20.9	10	26	0	5.3	27.2	4.5
10	Karnataka	61.6	52	21	23	37.5	30.7	16.9
11	Kerala	64.4	17	16	46	10.4	11.0	28.3
12	Madhya Pradesh	50.8	41	30	37	21.3	47.0	16.9
13	Maharashtra	54.8	53	30	61	37.5	37.9	48.5
14	Orissa	47.8	36	26	30	24.4	28.9	18.1
15	Punjab	65.4	37	17	38	36.0	26.4	17.6
16	Rajasthan	52.4	29	28	15	19.7	37.5	5.9
17	Tamil Nadu	74.5	38	20	33	25.1	24.3	23.3
18	Uttar Pradesh	40.3	27	28	13	20.6	40.3	6.7
19	Uttarakhand	7.2	29	19	17	15.8	18.4	4.8
20	West Bengal	50.1	34	22	19	21.3	24.4	19.2
<b>All India</b>		<b>48.6</b>	<b>37</b>	<b>24</b>	<b>26</b>	<b>27.8</b>	<b>30.6</b>	<b>19.6</b>

## SEPARATION IS NO SOLUTION TO THE PROBLEM OF REGIONAL IMBALANCE IN DEVELOPMENT

Nilakantha Rath

*The States Reorganisation Commission completed the task of reorganisation of the states in India on the basis of language. But, two other tasks remained: the problem of very large states, and the related problem of "one language, one state", instead of "one state, one language", which was what that Commission had created. Over time, discontent developed in many states about unequal regional development. The Fact Finding Committee on Regional Imbalance in Maharashtra identified imbalance on individual aspects of development, mainly with the district as a unit, and formulated a step-by-step approach to its eradication by identifying the physical quantum of imbalance and successively bringing the lagging districts to the state average level. Unfortunately, this approach does not appear to have been properly followed in the last two and half decades. The lack of development of inter-regional social empathy, as reflected in the attitudes and concerns of the political entities, appears to have led to the persistence of the feeling of neglect. That can be a basis of separation. But, creation of one or two separate states by itself can not solve the problem of regional imbalance and neglect, unless persistent effort is made in that direction. Proper decentralisation of power and resources to the Zilla Parishads and lower levels alone can atone for this.*

Two decades after the movement for the bringing together of all adjacent areas where the bulk of the population were speaker of a particular language started in Orissa towards the end of the nineteenth century, the Indian National Congress, in its Nagpur session in 1920, passed a resolution constituting its provinces for its provincial committees on linguistic basis. The British government followed this up in 1936 by constituting three separate provinces, Orissa, Bihar and Sindh, on the basis of the languages spoken, namely, Odia, Hindi and Sindhi, respectively. In independent India, Andhra and Madras (Tamilnadu) were formed as two separate linguistic states in 1952. The acceptance of the States Reorganisation Commission's report by the Government of India in 1956 led to the formation of a number of separate states, most on the basis of language. The basic approach appeared to be: 'one language, one state', except for Hindi that had multiple states. There was another exception: the bilingual Bombay state. This was undone in 1960, when two separate unilingual states of Maharashtra

and Gujarat were constituted. But for irritants of pockets of areas inhabited by people speaking one language being left in some other adjoining state, the reorganisation of Indian states on linguistic lines appeared almost completed.

But, two other problems appeared to remain: the problem of very large states and the necessity of 'one state, one language' instead of 'one language, one state', the two being essentially related. Professor K.M. Panikkar, a member of the States Reorganisation Commission (SRC), had, in a minute of dissent [Government of India, 1955], strongly pleaded for the breaking up of the state of Uttar Pradesh into at least two states, on the ground that such a large state, in terms of population, with very heavy representation in the Lok Sabha and the Rajya Sabha, would be counter to the health of the democratic federation of India. The matter was taken up by Dr. B.R. Ambedkar (who, due to ill health, had not been able to make his presentation before the Commission or publicly at that time) in a book-let written in December 1955. While supporting Prof. Panikkar's proposition, Dr. Ambedkar went forward and advocated the splitting up of large states like Uttar Pradesh, Madhya Pradesh, Bihar and Maharashtra into smaller and more manageable homogenous unilingual states. He proposed three separate states of western,

central and eastern Uttar Pradesh, two separate states of north and south Bihar, two separate states of northern and southern Madhya Pradesh and three separate states of western, central and eastern Maharashtra, besides a city state of Bombay. Ambedkar argued that while 'one state, one language' was a proper approach, there is no justification in insisting on 'one language, one state', as the SRC appeared to have done. Besides avoiding the very great weight of a single very large state in the central Parliament, a point forcefully made by Prof Panikkar, such small states will lead to better organisation of administration and provide better training ground for politicians in the government and legislature. Regional differences, often of differing historical origins, often tend to be overlooked in a unified large single state.

Like always in such matters in our country, these suggestions were then ignored, but taken up later, piece meal, at long intervals. Thus, Punjab was split into three smaller states in 1980 and Bihar, Madhya Pradesh and Uttar Pradesh were divided into two separate states each, at the turn into the present century: Chhattisgarh was separated from Madhya Pradesh, Jharkhand was separated from Bihar and Uttarakhand, a small part of Uttar Pradesh, from that state (remember Ambedkar). Now, there is a renewed

demand for Telangana in Andhra Pradesh, for Vidarbha in Maharashtra and one or two others in other regions. The present Chief Minister of Uttar Pradesh has advocated splitting the present state of Uttar Pradesh into five separate states. There are strong advocacies for the constitution of a separate state of Bundelkhand, consisting of parts of Uttar Pradesh and adjoining Madhya Pradesh.

The reason for such renewed demand for separation of part of a single unilingual state and of a very large state is that there is a strong feeling in the region demanding separation that it has been neglected by the state government in matters of socio-economic development which even today is the primary responsibility of the state government. The contents of this socio-economic development are not always clearly specified and often they appear to differ, depending on the groups of the discontented that advocate separation.

A little over two and half decades after the formation of a separate state of Maharashtra, such discontent in large parts of the state led to the strong advocacy for the setting up of regional development boards, which had been written into the Constitution, to advise the governor of the state who will make allocation of resources for remedying the

imbalances. As a result, the state government constituted a fact-finding Committee on Regional Imbalances in Development in the State, under the chairmanship of Prof. V.M. Dandekar and consisting of a number of independent academics and some senior officers of the state government. I was one of the members.

The first two tasks before the Committee were to define development and to identify regions. After considerable discussion, the Committee came to the conclusion that only such socio-economic provisions which were the responsibility of the state will have to be examined for the purpose. In matters that were dependent on private investment and enterprise, the role of the state is largely negative - to suggest what shall not be permitted where. As for regions, the Committee realised that in the matter of provision of every socio-economic facility by the state in all habitations, rural and urban, looking at the aggregative two or three or four regions will not be helpful for the state to address itself in regard to resource allocation for its provision. The question will remain: how are the resources to be allocated to the individual habitations that lack such provisions. Therefore, it was decided that, by and large, the district shall be the unit for identification of deficit in each provision. In matters where the provision at the state



level was very poor, it would be more appropriate to take the taluka or the block as the unit for identification. From such district level data, aggregation for broad regions can be presented; but the unit of identification and action has to be the district.

The next question tackled was one of measurement of imbalance in matters of development of the districts. Since there was a large number of matters of development action by the state, beginning with provision of all-weather roads to villages and towns, of primary and secondary schools, of primary and district health centres to provision of flow irrigation and agricultural development programmes, it became clear that imbalance in regional development has to be measured separately for each such provision and remedial action provided for each separately. Aggregating all these into a single measure of imbalance of development of the district would be a meaningless exercise from the point of view of the state's action in remedying the imbalance.

The basic provisions had to be provided in every village. Flow irrigation had to be provided to all the land in the district that could be potentially irrigated by such projects. The data collected by the Committee showed how many villages/towns had the facility in complete

measure and the extent of shortfall. One approach to remedying the shortfall would have been to start with the district with the largest percentage of villages without the facility in the state, and suggest that the district be brought to the next lowest level first. The same approach could then be followed for the next round.

But it was realised that this ran the risk of most districts with no financial provision for the facility until the lowest district had come up to the next lowest level. This would be politically and socially untenable. So it was decided that the districts that were below the state average for the particular facility in the villages should first be identified and then the extent of shortfall in each such district be calculated. The state should provide resources to bring the villages in each such district to the level of the state average. Each such district would receive funds in proportion to its shortfall from the state average. The years taken to bring the districts to the level of the state average would depend on the budgetary provision made by the state legislature for the purpose every year. Once the necessary number of villages without the facility are provided with it to bring the district position to the level of the state average, the state average should be calculated again. This will naturally be higher. And the same approach to allocation of resources for the purpose to bring the districts below the new state

average will naturally cover a larger number of districts than earlier. In this manner the successive state averages would increase, until all districts are covered fully by the facility.

This manner of calculating shortfalls from the state average successively, for each item of socio-economic facility, has the advantage that no district will be without some financial provision for some or other facility in any year. For, it was most unlikely that the same set of districts were below the state average in regard to all facilities. The chances of unhappiness at the district level with such approach would therefore be eliminated.

The Committee's report showed the physical shortfall for the first round in case of every facility. The Committee also made a calculation of the cost of the first round of action for every facility, on the basis of the average cost for creation of such facility estimated by the concerned state department, on the basis of prices prevalent in 1983. These could be aggregated to show the amount of expenditure in the first round that would be involved, for the state government and the legislature to judge and make provision for. It is obvious that the proper shortfall was physical; the monetary expenditure will change from year to year

due to changing prices. The real shortfall, in physical terms has to be seen and shown every year for every facility.

And finally, the Committee said that if this approach is accepted by the state government and the state legislature, there will be no need for the regional boards, since there will be no further work for them in this matter.

But this report and the recommendations were not fully accepted by the state government. The Regional Boards were created. They followed their own lines of measurement and recommendation. The Governor had the unenviable task of reconciling their recommendations and suggesting allocations to the state government. There was always a reference by the government to a financial backlog for the regions. It is difficult to understand how this figure came to be calculated, certainly not in terms of the Committee's first round estimates at 1983 prices!

The result is, the problem of regional imbalance persists in Maharashtra. When recently the State's Home Minister was appointed the guardian minister of Gadchiroli district, his first reaction on visiting the district was the inadequacy in development work in the district. This inadequacy is in regard to the very same basic provisions about which the 1983

Committee had made its suggestions. This is symptomatic of the inadequate provision of these facilities two and half decades after that Committee's recommendations, fifty years after the creation of Maharashtra and sixty years after the creation of the Republic of India.

It is no surprise, therefore, that there is a renewed demand for the creation of Vidarbha. No one has taken the trouble to present up-to-date data on the lines of the Report of the Committee on Regional Imbalance to show how Vidarbha or any other region in the State has suffered from negligence. This is because perceptions of negligence continue to be unclear, sometimes different. There is an overall lack of trust in the political leadership of the successive governments of the state. The ministers of the state government coming from one region have little knowledge of the problems in other region and do not appear to show interest in these and sympathise with the regional people and their problems. Most of them have no social contact or relation with these regions. One is reminded of what Ambedkar wrote in 1955: 'It is a vast area and it is impossible to have efficient administration by a single state... Even from the point of view of the Marathas why should there be this consolidation? What affiliation has a Maratha of Satara got with the Maratha of Aurangabad? What affiliation has a Maratha of Nasik

got with Maratha of Ratnagiri? What care and interest a Maratha of Satara is going to bestow upon the problems of the Maratha of Aurangabad? What care and interest a Maratha of Nasik is going to bestow upon the problems of the Maratha of Ratnagiri? The consolidation has no meaning and can serve no purpose'. Ambedkar does not refer to Vidarbha. But, today one can add: what relation do people from western Maharashtra have with the people of Bhandara and Chandrapur? The people from Ratnagiri possibly at best know that Bhandara grows rice; but nothing else, including how and when. It is a vast state with highly regionalised societies, with little connection between one another. It is no wonder that at the level of cabinet responsibilities and political organisation, there is little real understanding of the people and their problems from other regions. Even half a century after the formation of united Maharashtra this remains the situation. And, this appears to be at the root of the renewed demand for separation.

A separate state will greatly minimise these problems of lack of understanding, social cohesion and sympathy. In fact, one wonders if with the separation of Vidarbha, there will not be a demand, at some interval, for separation of Marathwada. It was this that led Ambedkar to suggest three states, not two.

Another useful result of multiple Marathi speaking states is also possible. With 'one language, one state', the fear of regional chauvinism, so detrimental to the Indian Union, was expressed by people like Ambedkar. While Marathi has not become the sole official language of the state and the courts, manifestations of such chauvinism are already visible. More than one Marathi speaking states is likely to be a check on such tendencies: There is little possibility that both the people and their leaders in all Marathi speaking states will speak the same language and raise the same slogans.

However, whether there are two Maharashtras or three, the problem of regional imbalance will remain, if it is not properly understood and systematic action taken to eradicate it. The mere formation of a separate state is no solution to this problem. Moreover, even after the solution to the problem of imbalance in development is taken care of by adoption of the approach suggested in the Report of the Committee on Regional Imbalance, there will be new emerging problems. The best way to handle these is

decentralisation of responsibilities and resources at the district level, as was very well tried out under the Zilla Parishad Act of 1961. Unfortunately, the party in power destroyed it after ten years of very encouraging operation, because the Ministers and MLAs felt neglected in their constituencies. This arises out of lack of understanding of the responsibilities of the elected representatives of the three tier system. The surest way of avoiding emergence of regional imbalance in development due to poor understanding of local problems and possibilities is to empower the elected local bodies with powers and financial resources to take decisions on local problems and handle these in their best considered ways. We must learn from our past mistakes and take steps early enough for their redress.

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## PROSPECTS OF INDIAN AGRICULTURE

Nilakantha Rath\*

Indian agriculture has undergone a change during the last two decades. Till 1991, the population censuses show, the proportion of the total population engaged in agriculture, either as cultivators on own account or as wage labour, was steadily declining. But the total number of people so engaged was continuously increasing. The 2001 census showed that the total number of people working as cultivators had, for the first time since 1991, declined in most states. Even the total number of persons working in the main as wage labour had also declined. Only the number of marginal farm workers, that is, workers who reported working for less than six months in the year, had increased. And, this was mainly due to much larger number of women working as marginal farm workers.

The biggest increase was in the category of non-farm casual workers. The Economic Censuses of 1998 and 2005 showed that the non-farm regular, that is, salaried or self-employed persons, in traditional household manufacturing or trade had increased; but the biggest rise was in the category of casual labour. Regular workers in modern industry had showed little rise in numbers.

While we have to wait for the data on these for the just completed census, there is every reason to believe that the trend of 1991-2001 has continued: the absolute number of persons in agriculture has declined further.

The average size of cultivated land per cultivating household has also greatly declined. Today more than three-fourths of the cultivating households have less than one hectare of land to cultivate. This has been not so much due to the law of ceiling on agricultural land holding. It has been mainly due to the growth of population, leading to subdivision of land holdings.

The growing number of households or persons with very small holdings has led to some moving out of agriculture. They either lease out their little holdings or sell those to others or lose these to money-lenders or, in extreme situations, keep the land fallow. Of course, some persons with larger land holdings have moved out because they or their children found better sources of occupation and living. But, the overwhelming numbers belong to the very small and marginal land-holding class. The non-increasing scope

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for wage labour in agriculture has also led to decline in full time wage labour in fanning.

The total income generated in the agricultural sector, in most states, has increased over the years. Since the number of people dependent on agriculture has declined during the last twenty years, the per capita income of the population dependent on agriculture has slowly risen. But, for many the income is still below the poverty level. Most tribal farmers and farmers with small un-irrigated holdings are in a particularly disadvantageous position. That is the reason people are moving out of agriculture.

To-day in many regions farmers are complaining about inadequate availability of wage labour. Yet the number of wage workers is declining and people are moving out. How to explain this? The reason, it appears, is two-fold: In most regions, excepting perennially irrigated areas (like the Punjab and the irrigated deltas of the east coast), the need for hired labour for predominantly un-irrigated seasonal crops is confined to short periods. And, the very small farmers do not need such labour. Secondly, the wage in agriculture (which is often in practice lower than the minimum wage fixed by the government) is much less than the wage in nonfarm casual works of various

types. In perennially irrigated areas the problem of shortage of labour is less serious. (Look at the labour supply for sugarcane harvesting in Maharashtra: migrant labour from un-irrigated areas find work for almost six months in such fields).

We may not regret the decline in the number of people dependent on agriculture. But, the need for improvement in the income generated in the agricultural sector and hence in the per capita income in the sector is great. The rate of growth in total agricultural production has remained low all along. Till 1987-88 it was around 3 per cent a year. Then, after the sudden great increase in 1988-89 the rate of agricultural production has not been higher than what it was till 1987-

The effect of the Green Revolution brought home in 1966 has worked itself out. The basis of this revolution was the biological innovation of HYV wheat and paddy seeds and of hybrid millets. All these innovations had their origin outside India. And all these new varieties depended on availability of irrigation. The new seeds with the help of adequate moisture in the soil, could transform much larger quantities of plant nutrients (fertilizers) into higher grain yields. These varieties have worked in the irrigated regions of India, though not uniformly well, due to deficiencies in the

method of water supply. There have been no such basic developments in regard to any other crops, either in India or abroad, since then. The repeated exhortations for a new green revolution by political leaders, from the President downwards, have led so far to nothing. In some states changes in the cultivation of the dominant crops are being labelled as green revolution. But such change takes place as a result of price changes and changes in the method of water supply, not because of any basic biological innovation. Briefly, there is no sign of any basic technological change about any crop.

Nevertheless, there is scope for improvement in yields in regard to many crops. In case of crops like rice and wheat in the areas where these are grown under un-irrigated conditions, the yields can improve with provision of irrigation. Vast rice growing areas in eastern India are without irrigation facilities. The Madagascar method of SRI paddy - another foreign technique of production, requires much less water and much less seed than the traditional method of irrigated paddy. Most pulses and oilseeds are grown under un-irrigated condition. If provided with two or three irrigations in the growing season, the yield can increase many fold. And the water needed for irrigating these crops is much less than what the normally irrigated cereals like rice and wheat need.

The problem facing the possibility of increased production of most crops to-day is supplementary irrigation. Except in limited areas like the Punjab, parts of Haryana and western UP and the major deltas of the east coast, only a small proportion of the agricultural lands in the rest of the country is irrigated. Except in the Gangetic and the Brahmaputra valley, the remaining areas of the country have limited sources of water for flow irrigation. In such situation, the flow water should be so distributed amongst different crops that the return from acre- (or hectare-) inch of water is the largest. Naturally, the return from different crops has to be calculated in value terms. Many studies have showed that the heavy water using crops in the country, like sugarcane and paddy, give far lower return per acre-inch of irrigation water than crops like pulses, oil seeds, and even cotton and horticultural crops like grapes and vegetables. But, it so happens that to-day the bulk - almost 80 per cent - of the irrigation water in such vast water-short regions is used for such low-return-to-unit-of-water crops like sugarcane and paddy. A rational allocation of flow irrigation water such that the different crops grown under it can maximise the return from water is necessary. This will result in more agricultural production and much greater income from agriculture, water to larger areas of land, stabler agriculture

and even larger days of work in crop husbandry than is seen to-day under the present method of irrigation.

A question might be immediately raised: then why do farmers crave for irrigation water in these flow irrigation systems for crops like sugarcane and rice? The reason is very simple. The quantity of water used to irrigate, for example, one acre of sugarcane can irrigate anything between 8 to 10 acres of pulses, oilseeds, cotton and millets. But most of the farmers growing an acre or two of sugarcane in a command area, do not have 8 to 10 (or 16 to 20) acres of land in that command area. So, in view of the limited land area of most farmers in the project area, they naturally prefer water for sugarcane. This is the reason for the difference between the national economic interest and the individual farmer's interest. To subserve the national interest water should be rationally distributed by the state.

But this does not mean that there should be no irrigated sugarcane or paddy in such areas. Indeed, it is both possible and desirable to grow these heavy water consuming crops in the command areas of flow irrigation projects by recycling the ground water under the command area. The first Irrigation Commission of

Maharashtra in 1962 had indeed advocated such a policy. But it has not happened.

Water is becoming a very scarce commodity in our economy. Besides agriculture, industry as well as the growing number of people are demanding water in larger measure. The farmers are opposing this in most existing irrigation project areas. But no one seems concerned about economic use of irrigation water. Even before capital expensive drip irrigation is adopted, this rational economic use of water should be the first choice of method in the interest of greater agricultural production. Similarly, industry should also use water carefully. Indeed, recycling used water should be one of the obligatory requirements with industrial ilk. Households should also be charged at a much higher rate for using more water than the minimum needed for drinking, washing and other routine domestic use.

Rational economic use of irrigation water would lead to greater production of many agricultural commodities, but also economise in the use of water for the major cereals. To-day the government is raising the support prices of rice and wheat, often more than what the CACP recommends, in order to increase production of these crops and also to give a higher income to the farmers producing



these crops. The rational use of water will lead to more appropriate production of these crops and a better international trade in these commodities. Our domestic production of wheat and rice leads to very large storages in normal years, larger than what is needed for the purpose. With open trade in such commodities, we can operate our buffer in a more rational manner. And the need to offer very high prices will be obviated. The inflationary pressure of these prices can be minimised.

We store very large quantities of wheat and rice. But the quality of our storage is very poor. The loss in storage has become a routine matter of bitter criticism. When India was a surplus producer of wheat in the 1920s, there was a serious proposal to construct large storage bins of the type in the USA. But soon our position changed. During the last four decades, with large buffer stocks, we should have constructed such storage bins, in which, besides protection from rain, we can make suitable provision of insecticides and pesticides to save the grains from spoilage. The sheer prevention of loss of grain in such arrangement will cover the entire cost of these storage bins.

A very widespread complaint of farmers all over the country is the very high price of farm inputs and a relatively lower price at which they have to sell the

produce. The failure of the price support mechanism of the government in most states except the ones where very large amounts come to the market (for example, for wheat in north India, for rice in Punjab and in the Godavari-Krishna and the Cauveri deltas) is responsible for the low price of the produce. In the major rice growing states like Chhatisgarh, Orissa, Bihar, Jharkhand, West Bengal and Assam the Food Corporation hardly operates. The result is, farmers are obliged to sell their produce at lower than the minimum support price. This is unfortunate. In the interest of greater production and fair treatment to farmers, the Food Corporation should have purchase centres in these regions where farmers can sell their produce at the minimum support prices announced.

As for rising costs of inputs, the CACP has to take regional prices into account to announce minimum support price. The further factor in this matter is the cost and quality of inputs. The farmers in many regions purchase "improved" seeds from the market, certified by the seed dealers. No wonder, not only the price is high; the quality is also often poor. The same about fertilizers. The entire agricultural extension service, built up by the state at one time, has completely collapsed in most states. The input dealers are the extension advisors. It is time the district agricultural officers are assigned the task of devoting

the extensive farm lands of the government in the district to growing improved seeds (certified by the proper agency) for one crop or the other and selling these to farmers at the seed farm head. The agricultural officer's income should come from the sale of these seeds, without any cost to government. The officer can borrow the input costs from the bank and repay it from the sale proceeds. The price shall be the market price of the improved seed. This way the agricultural officers can do something useful without any cost to the government. They can advise the farmers on the method of cultivation of the crop, including the type and amount of fertilizer to be applied and the timing and quantum of irrigation, with the help of hand outs given with the seed.

These measures can help agricultural production grow at a steady rate. For

basic technological development, it appears, we will have to depend on foreign research, since our domestic research efforts have, by and large, not delivered the goods. If the agricultural universities and research institutions develop any new varieties, this should be given to the district seed farms to grow and sell in the open market. Competition with the seed from multi-nationals, in this manner, can help our farmers.

The declining number of farmers would be one useful development for agriculture. This may attract and retain more interested persons in farming in the years to come, something that Mahadev Govind Ranade had hoped and pleaded for more than a century ago. In addition to technological developments, that is an important factor for sustained agricultural growth in years to come.

**WATER RATES TO BE CHARGED FOR WATER SUPPLIED  
FROM THE RESERVOIRS ON THE RIVERS AND  
STREAMS IN MAHARASHTRA FOR IRRIGATION,  
INDUSTRY AND HOUSEHOLD USE  
(For period 2013-16): Suggestions**

Nilakantha Rath\*

*This paper is in response to the circular by the Water Rate Fixation Authority of Maharashtra, inviting suggestions for the period 2013-16. The paper suggests the principle for determining the water rate in flow irrigation, saying that the water rate should be based on the maximum value product per unit of water provided. For this purpose it suggests the sources of information for calculation. It also suggests the basis for water rates for industry and household use.*

In order to arrive at the rates for water supplied from the reservoirs on the rivers and major streams in the state of Maharashtra, three basic sets of data are required: (A) The volume of water impounded in each reservoir at the beginning of the Rabi season, the additional flow into the water till the beginning of subsequent June, the water sent out of the reservoir through the main canals and pumps, if any, during the 8 months from October every year, and the volume of water in the reservoir in the beginning of June every year. In addition, it is necessary to know the volume of water sent out from the main canals into the distributaries and from the distributaries to the minors in each of the three seasons, Rabi, Summer and subsequent Kharif. (B) The original total capital cost of each project, the years since water was being provided from the system to users and the estimated remaining life time of the system, the annual operation and maintenance cost of the reservoir and the distribution system (which will include the salaries and allowances of the staff and other material expenses), the cost of salary and allowances of the staff below the level from which the Water Users Association will be responsible for purchase and distribution of water. It is also necessary to note the frequency of major repairs to the dam, the reservoir and the main canals and distributaries during its life time in the light of past experience. (C) The area under every crop under irrigation during the year and the per

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\*The author's report on the Economics of Irrigation in the Water-scarce Regions - a case study in Maharashtra, based on an enquiry into Pravara and Nira left-bank Canal areas, sponsored by the Central Water Commission, was submitted to the central and state governments and published in full in *Artha Vijnana* in March 1989. This report (Reprinted, in part, in the Documentation Section in this volume) will illustrate the propositions made in the present submission.

hectare material expenses of each of the types of crops - seasonal, annual and perennial - grown under irrigation as well as under unirrigated condition in and around the particular project area as well as the actual per hectare output of each crop, under irrigation and unirrigated, and its price in the open market during the harvest season.

These basic data are needed to help the Authority to arrive at an estimate of the net return per hectare meter of water provided to each crop in each season, which will help the authority to fix the water rate under the individual project.

#### (A)

1. The measurement of evapo-transmissional losses, plus theft, of water impounded in the reservoir and sent out to the fields is relevant not only for improvement of the distribution system to minimise such losses, but also to assess the area that can be irrigated in a season in any year under different crops. While the measurement of the extent of loss in transmission through the main canal and the distributory is necessary in order to estimate the quantity of water that can be supplied to the minors, when the system under each minor is under the control of a Water Users Association, which will buy water at the head of the minor, the

measurement below this is necessary in order to know the amount of water that can reach the field from the water course.

2. Theft apart, the loss in the main canal as well as the distributory during a season will depend on the temperature and humidity in the area during the period, the nature of the soil on which the system stands and the frequency with which water is let out into the system from the reservoir during the season. The data in Annexures 2.11 and 2.2 in the report, Maharashtra Water Resources Regulatory Authority (MWRRA) (2012), show the extent of loss in each of the three years' recorded for a number of irrigation systems in the state. The Table shows not only significant variations from year to year during the period of only 3 consecutive years but also variations from system to system in different parts of the state. While these variations need understanding in order to improve the efficiency of delivery, it is important to realise that, under the observed circumstances, state or even regional averages are not very meaningful for the purpose of determining the irrigable area in a season and therefore the water rate to be fixed in the particular project area. The MWRRA, beginning its work some three-four years ago, has unavoidably used state averages in discharge of its task. However, it is necessary to realise that such calculation has to be done

separately for each project. Indeed, the seasonal crop pattern and the water for it as well as the water rate has to be fixed for each project separately and not for all crops for all projects in the state with the help of a state-average calculation.

3. Since the discharge of water into the main canal and out of the distributories of the main canal are available (or should be available) for each round of water discharge during a season, It should be possible for the authority to obtain this data routinely for every project every year. This is necessary for determining the volume of water actually discharged as well as to be discharged to the minors which are required to be under the control of the Water Users Associations. The routine receipt of such data from each project would inform the Authority of the present and the emergent operation of the system including the frequency of supply, the interval between the supply times and the volume of water supplied each time. The data should be made available to the Authority directly.

4. As for the loss of water in the minor and the water course, it is necessary to carry out measurements in every irrigation system, not only in a select few, since water rate should be fixed for each system separately. One important point to pursue is ensuring the required rate of flow of water into the water course at the outlet

head. In Maharashtra, the outlets are required to be designed for one cusec discharge of water into the water course. But this is rarely the case. It is almost always less, and is never uniform. In the early years of the Maharashtra Water and Land Management Institute (WALMI), Aurangabad, the then Director, Mr. Dhamdhere, carried out a comprehensive survey of all outlets into field channels of the Mula Irrigation System and found not a single outlet with a design of one cusec discharge. It varied between half a cusec to less than one. If volumetric water supply to each field is to be designed and ensured in every system and every field, then this has to be promptly implemented. The Authority should ask the irrigation department to complete this within the next three years in every one of our flow irrigation projects on the ground. This is absolutely important for the task in hand of the Authority.

5. It is not necessary, in my view, to find out how much water is used by the plants in the irrigated fields and how much percolates down. The frequency of water supply in the season should be decided on the basis of the type of soil being irrigated and the crop to be grown, in order to ensure moisture in the root zone of the plant and avoid unnecessary seepage.

6. It is also necessary to find out on a regular basis the extent of loss of stored water in the reservoir through evaporation and seepage during each season. This will help the Authority to assess the quantity of water so lost in the summer season and therefore the cost of water for irrigation in that season. Like everything else, this should also be available to the Authority on a regular basis every season and not only for a few years to calculate an average.

7. These three sets of data will tell the Authority what quantity of water, discharged from the reservoir, will reach the field in the project area. This will be necessary to determine the water rate.

### (B)

8. The next set of data required relate to the annual cost of water impounded and sent to the fields. The two components of this total cost are: (i) capital cost, and (ii) current or annual cost, called Operation and Maintenance Costs (O&M costs). The Present proposal ignores the capital cost. I think this is unfortunate. Even if the state government decides not to recover the capital cost from the users of canal water used for irrigation, it is necessary, for every project, for the government and the Assembly to know the extent of annual subsidy to the farmers (and other consumers) in a project area.

In order to estimate the annual capital cost of a project which has already been completed, the Authority should obtain the total actual capital cost of the completed project, the estimated life time of the project and the rate of interest to be charged for the recovery of this capital cost. For projects already completed and in operation, it is not necessary for the Authority to go into the past years of the operation of the project. The simplest rule may be to divide the total capital cost of the project by the number of years of estimated life to arrive at the simple average per year capital cost and deduct from the total the cost for the years completed till now. This the state has already borne and the question need not be raked up. The remaining capital cost is to be recovered in the remaining years of the life of the project.

9. There is an interest rate involved in this: since the money is to be recovered in annual installments over a large number of years there is an interest cost of delayed recovery of parts of the capital. The interest to be charged should be the rate of interest charged by the lender of the money to the state government, be it the Central government or the loan taken from the public for the state's capital expenditures. Whichever interest is relevant for the project should be taken to be the rate of interest at which the annual recovery is to be calculated. It is

useful to remember that if the past interest is higher than the present day interest rate at which the state borrows money, then the present day interest rate should be used for this calculation. For, the state can repay its past loan and incur new debt for the relevant amount at the current lower rate. But if the past rate is lower than the current rate of interest, the lower of the two should be used.

10. The uniform annual recovery of the capital cost at the relevant rate of interest over the remainder of the life of the project can be calculated with the help of simple readymade tables showing recovery of a rupee's present capital over x number of years at y rate of interest.

11. There may be major repair works of some capital structure or other of the project. For this the same method of calculation should be used from the date of incurring the cost for the estimated life duration of this major repair work. This annual cost should be added, for the years of its life, to the long term annual capital cost of the project.

12. Now we turn to the annual operation and maintenance cost (O&M cost) of the project. It includes the salaries and allowances of the persons - engineer down to the casual labour - engaged in this task on the particular project. The Authority's first set of proposals

excludes some part of the total salary paid to certain types of staff (like Sixth Pay Commission's recommended scale, etc.). The justification for this is not provided in the report. It is not clear to me. If the Authority feels that the new salaries of any class of the employees of the project are too high, it should recommend alternative staff at lower salaries for the project. The material costs of any repair and maintenance work are also to be taken into account.

13. There is one item of the O&M cost that the Authority includes in its calculation that should not be included, in view of the policy change in regard to the operation of the project. The Authority includes the salary of the staff engaged for work below the distributory level and the cost of maintenance of the minor and the water courses. There has been a policy decision that water is to be sold at the distributory level (at the head of the minor) to the Water Users Association (WUA). This Association should have all farmers that own or operate land in the command area under the minor as its members. The WUA should be responsible for the distribution of water to its members' fields as well as for the repair and maintenance of the minor and the water courses. Under such circumstances, the staff for this purpose (the *patkari*) should -and would - be an employee of the WUA and not of the state

government. It is only then that the WUA can have proper control over the work of the *patkari*. Similarly, the task of repair and maintenance of the minor as well as the water courses should be the responsibility of the WUA. These costs should be borne by the WUA and therefore these charges should not be included in the total O&M costs of the project by the Authority. The WUA will recover these costs from its members along with the cost of water supplied by the canal authority.

14. The same should be the approach to the cost of distribution of water (including the electricity cost) lifted by a Lift Irrigation Scheme or an industrial user or a village drinking water supply scheme, from the reservoir or its canal.

15. Thus, the Authority will have two parts of its cost of supply of water to the user, the annual capital cost and the annual O&M cost. While it is ultimately the Government and the Legislature that will, in such publicly implemented projects, decide whether and to what extent the capital cost is to be recovered, the Authority should do the necessary calculation and compare the costs per acre-inch (or hectare-meter) of water supplied, along with the net additional benefit, in money terms, from the use of such water, in order to judge if charging any part of the capital cost is sustainable for the

users. In my view, the industrial users of such water should be made to pay the entire cost of the water taken by them. So should the villages and towns taking water from the reservoir or its canal.

16. In the light of the above line of reasoning, it appears unnecessary to have the three-fold categorisation of the so-called "fundamental parameters", namely, Affordability, Accessibility and Quantity and Timeliness of Supply and the weights assigned, arbitrarily, to these for the different major category of users of water (see section 12 of Annexure 1.2 of the Approach Paper). These are matters that should not be pre-judged and put into a formula before allocation of costs. The cost of water should be uniform. It is for the state to decide, what part of the cost, to whom and when, is to be exempted. The Authority can make suggestions to the effect, as has been suggested above in regard to the Capital Cost. The government should know to whom, when and by how much subsidy, in the nature of exemptions, is being given or is to be given.

17. Given these two total costs, namely the annual capital and the O&M costs, the per unit of water cost at the head of the minor may be calculated by dividing the total cost by the volume of water let out into the minors. This is necessary in order to later suggest the water rate.



## (C)

18. We now turn to the calculation of returns from the use of water in the reservoir to compare it with the cost of provision of water in order to have a basis for the charge the user should pay. *In regard to irrigation, it is basic to calculate the best return, in value terms, per unit of water that can be obtained in crop production. Often, what is sought is "more crop per drop", meaning more output, in physical terms, per unit of water. That is not what is relevant. Surely, all crops under irrigation will produce higher yield per hectare than under unirrigated condition. But, when multiple crops can and will be produced by farmers in a season/year under irrigation, it is necessary to see what combination of crops, subject to the available quantity of water, will give the highest return. This is possible only when the crop productions are compared and combined in terms of additional value produced. The present Approach Paper does not appear to do so.*

19. In order to know how much of water would be required for irrigating the total command area under a minor, it is necessary to know the types of crops that are or can be grown under irrigation in each season, the material input costs (per hectare) required for growing each crop, the average per hectare yield of each crop

under irrigation as well as under unirrigated condition in the area, and the price at which the crop is sold in the regulated (or unregulated market) nearby. [This is one reason why the exercise entrusted to the MWRRA should be done separately for every project. Broadly, the crops best grown under irrigation in the four districts of the Vidarbha region, for example, will be quite different from the use pattern in the western Maharashtra region; and, so on.] And, finally one must know the quantity of water required for irrigating every crop, during the season, at the field level and the number of irrigations, with intervals, normally required.

20. The crops actually grown or likely to be grown, while varying from region to region, are the seasonal cereals like jowar, bajra, wheat and rice, the various types of pulses and oilseeds, two seasonals like long staple cotton, and annual crops like sugarcane and banana, and also orchard crops like grapes, pomegranates, and other fruit crops. For each project, such crops should be identified.

21. It is not easy to find out from available data the actual yield rates of each of these crops in any particular year. For a crop like sugarcane, which is largely processed into sugar in co-operative sugar factories, there is a fairly reliable source for this information. The

MWRRA should seek the help of each such factory in the neighbourhood of a flow irrigation project and ask the factory to give it the data on the quantity of sugarcane harvested by the factory from the members' flow irrigated fields during each particular year and the total area from which this was harvested. Since the factory harvests the cane of its members and records it for the purpose of making payment to farmers, this data would be available from the factory every year. The factory should be requested to give the final price paid for the quantity every year as well.

22. For other crops, the task is not so easy. For cotton, long and short staple separately, there is record of arrivals, both quantity and the area from which it was harvested and the price paid for the quantity, with the agents of the monopoly procurement scheme in each regulated market in the cotton producing areas. We need such data from the markets that serve the irrigated areas. This, by proper arrangement with the agency, should be available every year.

23. For most other crops this facility is not there. Therefore, the MWRRA has to take recourse to more than one source for the data on per hectare yield and price. One source is the results of the annual crop-cutting survey undertaken by the agricultural department of the state.

These, of course, do not relate to particular project areas or even districts, but are sampled for estimate for the state as a whole. But, on request, the state agency can give the Authority data on average yield rates of individual irrigated crops, not for individual projects or districts, but for broad regions, like western Maharashtra districts, Khandesh districts, Marathwada districts, Vidarbha districts, districts of eastern Maharashtra and Konkan. Since these are not sampled for such smaller regions, they have to be used with caution. But, it is important to remember that these data are available every year and should be so obtained.

24. Another source of data for this are the respective agricultural universities in the regions. For a variety of purposes, they generate such data on their farms under irrigated conditions, and can share these with the Authority. And, finally, the agricultural department has in the past generated such results for assessing the yield potential of various crops and the quantity of water required for irrigating such crops. These are not regular annual data, but collected at some time or the other for the purpose in hand. Nevertheless, they will be useful for assessing the value productivity of the individual crops in the region (not necessarily in a particular project area) as well as the quantity of irrigation required to irrigate every crop.

25. These yield and water use data from various sources should enable the Authority to arrive at an acceptable figure of yield of different crops under irrigation in different regions of the state and yield per acre-inch (or hectare-meter) of water used, from time to time. It is desirable to keep a continuous track of such data to know if any changes are taking place in this due to varietal changes, widely accepted, or other reasons.

26. So far as prices of the products are concerned, apart from the sources for sugarcane and cotton every year, mentioned above, the Authority will have to depend on the average or median auction price for such crops in the immediate three post-harvest months of the crop from the relevant regulated markets every year. It is not proper to take just one price in one month, but get the daily average or median price in the market for the three post-harvest months over which farmers bring their produce to the market. The prices from the markets nearest to a project area should be used for obtaining the prices of the produce relevant to the particular project.

27. Prices of products change from year to year due to general inflationary conditions. Furthermore, the relative prices of the different crops do not remain unchanged from year to year due to changing production conditions. This is

the reason why a single year's price data for different crops should not be used to arrive at the relative value productivity of different crops grown in the project area. It is desirable to calculate the relative prices of the crops every year and arrive at an average of the relative prices of the individual crops grown under irrigation in a project area with the help of annual data for 10 to 15 consecutive years in the past. Indeed, the Authority should, with these annual data prepare a moving average of the relative price for 10 or 15 years by adding new years and deducting as many in the beginning past years.

28. Once these relative prices and their moving averages are established, the Authority should take a particular product's latest actual price and obtain the current relative prices of the other crops by using the average relative price relation in order to estimate the value of the yield of crops under irrigation in the latest year. This method is useful to avoid the occasional suddenness of change in relative market price while providing for a steady change or trend in it, if any.

29. Having arrived, in the above stated manner, at the value of output of every relevant crop under irrigation in a project area and the quantity of irrigation water used to produce it, the Authority will be in a position to arrive at the value generated per acre-inch (or hectare-meter) of

irrigation water for every crop. This should provide the basis for allocation of water to the irrigated fields in different projects. Of course, water is not to be given to a single crop producing the highest value per unit of water in every season. Farmers are sure to grow different crops in a single season. The Authority should take the help of agronomists as well as of the knowledgeable farmers of the area to arrive at a combination of crops that can/should be grown in the area in the season, subject to the most economic use of water. This will help the Authority to arrive at the quantity of water to be released at the minor-head every season to the entire command area under the minor. What crops the water-receiving farmers grow in the season will be their own choice. What the Authority will assess is the type of cropping that would give the highest return per unit of irrigation water to the economy in the project. If the farmer/farmers decide to grow more water-using crop then they will find themselves short of water. But that is their choice, not that of the irrigation authority.

30. The above calculation is being suggested on the basis of the gross value of output per unit of water. One may say that not every crop may have the same proportion of this value as material cost of production. If so, the total returns to labour, land and water would be different.

Therefore, it may be useful to deduct the material cost, (i.e., the cost of seed and all other materials used in producing the crop) from the gross value of output calculated. Then one can compare the net social return to a unit of irrigation water and work out the best crop combination in a season on that basis. This raises the question of the source of data for such material costs for every crop under irrigation in the project area.

31. These data are not as easily accessible. One major and reliable source of such information is the survey into the cost of production of the major crops, carried out every year, by the government of India in every state. But, the sample of farmers for the purpose relates to only the farmers growing the major crop in which the government is interested. These major crops are the major cereals, cotton, sugarcane and a few others. But, the data relating to the sample farmers collected in each year includes the costs incurred for every crop grown by the sample farmer, besides the major crop concerned. These data are collected from the sample farmers for three consecutive years after which some other major crop is taken up. But, for many or even most crops data are available for material inputs (quantity and value) for most of the years. The difficulty is, these data are not routinely tabulated. If the Authority will request every agricultural university

in the state, (who routinely carry out the survey in their regions and are the custodians of the basic data), to extract such data relating to the relevant irrigated crops in each farm for each year, it will provide the most useful basis for such information. The Authority can ask for the data from the present year onwards, without going into the past, to save expense and time. These data will provide the basis for estimating the material cost in case of every crop, to be deducted from the estimated gross value of output.

32. The other such data that can be obtained is the data for such crops grown by the agricultural universities on their farms. The data from them should be the physical units, like labour days, manure, fertilizer, etc. Of these, the data relating to the material inputs should be converted into values for specific project areas using the prices of these prevalent on the farms in the region. (The labour data may be used for other purposes discussed below). These and the earlier set of data from the cost of production surveys would help the Authority to arrive at the material costs of production of the different crops for every year.

33. After the material expense of each crop under irrigation is established, it can be deducted from the estimated value of the gross produce of the crop under irrigation to obtain the return to labour, land

and water from the crop. This net social return may then be divided by the quantity of water required at the field level to produce the crop, in order to arrive at the net return per acre-inch (or hectare-meter) of water. The same procedure as described in paragraph 29 above to determine the most appropriate cropping pattern under irrigation giving the highest net return to the total quantity of irrigation water supplied in the command area may be followed.

#### (D)

34. Having arrived at the return to a unit of irrigation water in the project, the task before the Authority is to fix a price to be charged for the water to be supplied. Since the policy is that the WUAs in every minor are to buy water in bulk, the authority shall decide the quantity of water to be provided to the association in every season, the frequency of it in every season and the water price to be charged of the WUA. It is pointless to think in terms of the individual crops for the purpose. The crop pattern for the most economic use of water has already been decided. The farmers are left free to decide what crops they will grow with the quantity of water to be made available in the season to their plots. The price of water should be uniform for all purposes. It is pointless to discriminate between marginal, small, medium and large

farmers for the purpose. Each will receive water in proportion to his land under irrigation in the command.

35. The major task is to decide on the price to be charged, and this involves a decision about the cost to be covered, the total cost including capital and O&M cost or only the O&M cost. For this purpose the Authority should first see the difference between the value of the gross produce of every crop under irrigation in the area and under unirrigated condition. This latter data can be found from the same sources from which the irrigated produce data are obtained, as mentioned earlier. It is of course important to remember that the difference in yield under the two conditions is not entirely due to water; more or less of labour may also be involved. Taking account of these, the Authority can find out what proportion of the net return due to water should be charged, whether the entire total cost of water or only the O&M costs or something in between. Giving these figures separately in its recommendations will help the government to decide whether and to what extent they would wish to subsidise the users. It is best that, whatever the subsidy, it is uniform for all farmers.

36. The method of arriving at the cropping pattern in the command area that gives the highest return to the given

quantum of irrigation water may raise some legitimate doubts about the possible exclusion of some crops in the design. Let me give two examples. Earlier studies by the state's agriculture department on requirement of irrigation water for different crops show that an acre of (annual) sugarcane crop requires 180 acre-inches of water during the year, and an acre of hybrid jowar in the Rabi season 18 acre-inches. This means, 10 acres of Rabi jowar can be irrigated with the help of the quantity of water given to one acre of sugarcane. But the gross value of produce of one acre of sugarcane was just about half of the gross value of 10 acres of hybrid jowar. What is true of hybrid jowar is also more or less true of most other seasonal crops, with the exception of paddy. The working out of the most profitable crop combinations in a project area in terms of returns to water, therefore, may result in sugarcane being ruled out in designing the flow water amount and frequency to a field in the project area. For the many existing flow irrigation projects, in western Maharashtra in particular where sugarcane to-day accounts for more than three-fourths of the total irrigation water, this may be a very unwelcome proposition, to say the least. But, there is an answer to this problem.

37. The first Irrigation Commission of Maharashtra (1962) had recommended that farmers in the command area of any irrigation project should not only be permitted but encouraged to sink dug wells/ shallow tube-wells in the command area to recycle the water seeping underground from the canal system as well as in their fields, for use. The state government has now made this obligatory. The WUAs should be asked to sink such wells either on their own or with the help of their members in order to supplement the canal water supply to their fields for any more water-consuming crops (like sugarcane, banana, and paddy). This will enable better use of water in our irrigated areas and better distribution of irrigated crops. The Authority and the government should not put any charge for the exploitation of such ground water. It was a misguided decision taken in earlier times to charge 5% water rate from such wells extracting ground water. The present proposal of giving this up is therefore welcome. But, there is no point in the state bearing a subsidy on that account, as is stated in the report of the Authority. The water rate to be charged need not carry any such subsidy. The farmers or their Associations will incur the necessary capital and running cost to exploit the ground water.

38. The exploitation of such ground water in the command area under every minor and water course will provide opportunity for some/many member-farmers to grow a crop like sugarcane. It may not be as widespread in a command area as to-day; but it would be adequate to sustain a reasonably efficient brown-sugar manufacturing factory near the project. (And a number of such brown sugar manufacturing co-operative factories can own a single white sugar processing factory that can run the year round). The fear of complete loss of sugarcane will be largely misplaced. And, the total water supplied to the command area will be much greater and better utilised.

39. If the Association devises methods that can do with less water for irrigating a crop (like drip irrigation, etc.), there can and should be no objection to this. The Association can either reduce its requirement of water from the project or use the saved water for more higher water consuming crops. No incentives are required for this.

40. The basic points that the Authority must insist upon are as follows:

- (i) The WU Association should not only have all land owners/operators in the command area under the minor and its water courses as its members but also sign an agreement

with each one of them stating the quantity of water to be delivered to the plot in each watering and the number of waterings in each season to be provided. It is needless to remind ourselves that with an assured one cusec discharge from the outlet into the watercourse, the farmer's water requirement can be calculated taking the area of his plot under the outlet into account and the water can be diverted to his field for a duration that will ensure the quantity required.

- (ii) The Authority should calculate the loss of water in the reservoir due to evapo-transpiration in the summer season and then calculate the return to the volume of water let out in the summer season and compare it with the return in the Rabi season. If the return in summer is lower for the given volume than in Rabi, then it should consider greater delivery of water in Rabi rather than save it for summer. If however the total command area is being fully provided with water in Rabi, then the Authority might examine alternative use of water in Rabi by new lift irrigation schemes from the main canal on the upper side of the canal which does not receive flow water. It is inadvisable to waste water

through evapo-transpiration in summer rather than give it to larger area for lifting in Rabi season.

- (iii) The Authority should state in its agreement with the Association, which should be signed before the beginning of the Rabi season, that the water shall be provided to the Association as per agreement, and failure to do so for any round will involve a payment of a penalty by the Canal Authority to the WUA. This penalty should be laid down by the Authority. Similarly, If normally there is an agreement to provide some water in summer, but thanks to rainfall shortage, the reservoir is expected to run short of water for summer, the agreement must state the quantity of water that can be provided to the WUA in summer in the stated number of irrigation turns. The Association shall make pro-rata reduction of water to every user and this must form a part of the agreement of the Association with its members.
- (iv) The WUA shall pay the entire water rate to the irrigation authority before the end of the particular season. Failure to do so would mean cessation of supply from the beginning of the next season. Any disruption of supply as a result of failure of timely



payment of dues shall be at the cost of the WUA, and no penalty would be payable by the irrigation authority for this.

41. The rate to be charged per unit of water supplied in each season shall be revised at the beginning of every three-year period, since the O&M expenses will change. The capital cost or any part of it, if charged, will not change, except for the major repairs that have longer life and are not included in the O&M expenses.

#### **For Lift Irrigation Schemes from the Main Canal or Reservoir**

42. The water per unit of water charged to the WUAs shall be charged to the Lift Irrigation schemes lifting water from the reservoir or the main canal. The utilisation of water to be lifted under the scheme shall be estimated in the same manner and a similar agreement shall be signed by the Lift Irrigation Association with its members on the one hand and the Authority supplying water on the other. The logic of water use shall be the same as for the flow schemes and shall not be left to the will of the lift association. The cost of pumping water, the capital cost of carrying it to the highest level, and distributing it to members shall be borne by the Lift Irrigation Association and recovered from its members. The water supplying Authority shall ensure that no

more than the permitted volume of water is lifted by the lift scheme in every turn. The Authority should ask for a copy of the detailed electricity bill for each season for purposes of scrutiny.

#### **For Industrial Use**

43. For Industries lifting water from the reservoir or canal from the reservoir, the full cost, including the full capital cost and the O&M cost should be fully recovered. There should be no concession in this matter.

44. The industry shall be required to reprocess all water used by it for both industrial and other purposes, including human uses, obligatorily. The new industries seeking water should design systems for the purpose right from the beginning. Only after physical verification of such reprocessing devices shall water be supplied to the industry and after the first year a detailed verification shall take place. The industry shall, from the second year, receive only so much of water net of the entire reprocessed water, at the specified cost. Failure to use the entire water deserving to be reprocessed should result in denial of any water to the industry, with one month's notice.

45. *For industrial units already taking water from any reservoir or canal, notice should be given to devise reprocessing all*

water let out by the factory *as well as from other uses, within one year. Failure to do so should result in stoppage of supply of all water to the unit. In the light of past experience, it is only by enforcing very strict discipline that industrial units can be made to behave.*

### **Household use in villages and towns**

46. Like in case of industry, the domestic supply of water to villages and towns should be, to start with, made at cost, that is, the capital and O&M cost per unit of water. This is the cost at the point of lifting water from the system. The distribution cost, besides the cost of water purchased, should be charged to the consumers by the village or town authority.

47. In case of towns and cities as well as in case of villages, the quantity of water supplied per head of population at this minimum cost should be the quantity of water required by an average person for drinking, bathing, washing, cooking and for the toilet. The authority should estimate the total water needed for the estimated total population of the village or town (of course changing every year) on this basis. While this total quantity of water should be supplied at cost, any more water than this should be charged at three or four times this per unit cost. This will make the village/town authority

to require the households to devise ways of economising in the use of water supplied. The municipality of a town should ask its households to install purifying devices to process the water from the bathroom and the kitchen to make it fit for flushing toilets as well as washing vehicles and gardening. Of-course, this would be possible for houses around which municipality asks land to be kept free of construction. It is only the toilet water that should go into the drainage system. In case of big housing complexes, as well as large hotels, even the toilet water and the solid waste should be put into gobar-gas plants and the water from it should be used for gardening and toilets. This will economise in the use of water. But, since the canal/reservoir Authority cannot enforce this, the only way is to charge three to four times the basic cost of its water which might persuade the municipality and the populace to economise in the use of reservoir water.

48. The determination of the quantity of water from the reservoir and the canal system to be supplied to the irrigated command area in the manner specified above might, in some situations, result in some water in the reservoir being found surplus. This water should be used to irrigate unirrigated areas adjacent to the canal system, in the manner specified above. The Authority should also ask for

additional flow irrigation schemes in the same river to use the surplus water, rather than wait for expensive electricity. In designing new irrigation systems, the crop water requirement should be calculated in the above manner, to reduce wastage of precious water on less economically productive crops. We can see the advantage of this approach: much larger areas of the region can benefit from irrigation under such design than the present method where a relatively small area under sugarcane absorbs the bulk of the impounded water. (It is needless to point out that under many flow irrigation projects to-day the tail-end canal areas are often deprived of any water). With

larger area under irrigation, larger number of farmers shall benefit. Agriculture will be stabler in the region. Finally, these expanded areas under irrigation will employ a larger number of labour days during the year than the present sugarcane-based cropping pattern in flow irrigated western Maharashtra. And, still, there is scope for sugarcane in these systems, leading to most economic use of the impounded water, from the seeped part of it.

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## CHINTAMANRAO DESHMUKH

Nilakantha Rath\*

Remembering Chintamanrao Deshmukh is a pleasure, a privilege and an inspiration as well. Sir Chintaman Dwarakanath Deshmukh was the first Indian Governor of the newly formed Reserve Bank of India, and the first Finance Minister of the Republic of India during the first five-year plan. But that was not the most distinguishing aspects. As the Governor of the Reserve Bank of India he piloted India's role and contribution to the establishment of the International Monetary Fund and the International Bank for Reconstruction and Development, briefly called the World Bank. As the Finance Minister, he led the Union's finances during the first Five-Year Plan period and helped the Parliament's debates, discussions and formulations on financial matters with his budget speeches.

The Reserve Bank of India was statutorily formed in 1935. After serving as Deputy Governor for sometime he became the care taker Governor for a few months in 1943 and then became the first Indian Governor towards the middle of that year. India's sterling balances with the government of the United Kingdom were a feature right from the beginning. But it became growingly significant as the Second World War proceeded. By the

time Mr. Deshmukh became the Governor, the Sterling Balances had grown significantly. There were indications by that time that the war was going to end in favour of the Allies. So, the export earnings of India held in London as Sterling Balances by the Reserve Bank was of great significance to the country after the end of the war. Discussions had started between the office of the Secretary of State for India in London, the Finance Department of the Government of India in Delhi and the Reserve Bank of India. It is interesting to note that though India was very much under British rule, the Reserve Bank did not fully share the views and perceptions about the Sterling Balances either with the Government of India or the Secretary of State for India in London. It took a position that it considered necessary and important for India as a country and a nation in the post-war period. A second financial matter also developed at this time. The allied powers, mainly the British and the Americans, began seriously thinking about the International financial system and some institutions that needed to emerge for the purpose. The British circulated the Keynes Plan and the Americans the White Plan in this regard. Right in the beginning even the draft plans were not made formally available to India,

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either the government or the Reserve Bank. But, somehow receiving these plans, Chintamanrao, as Governor, thought that while in the long run the Keynes Plan was a more suitable one, in the short run, in the immediate post-war years, there were many provisions in the White Plan that promised to be more suitable for an under-developed country like India in its post-war reconstruction and development programmes. When finally, these became available, Chintamanrao formulated his tentative reactions. "The main objective of both the plans was the promotion of international trade through the establishment of an international system of clearing, provision of credit upto a prescribed limit to member countries in balance of payment difficulties, arrangements for orderly changes in exchange rates, prescription of guidelines for action to restore balance of payments equilibrium within a reasonable time and the creation of a permanent machinery for consultation and co-operation in running the international monetary system." It appears that his ideas were not quite in keeping with the thinking of the Secretary of State for India, nor with that of the economic advisor to the government of India. He, however, decided to take the Board of Directors of the Bank into confidence and, led by Sir Purshottamdas Thakurdas, the non-official members helped and supported the Governor in formulating

the Indian response to these plans. After some hesitation in the beginning, the economic advisor to the Government of India, Dr Gregory, fell in line. When finally, the plans were discussed in detail in an international conference in Bretton Woods, the Indian delegation was led by the finance Member and consisted of Mr. Deshmukh and two non-officials, Mr. Shanmugam Shetty and Mr. A D Shroff, and Dr Gregory.

The Indian delegation had two major objectives before it. The first, "... to contribute .... to the development of productive resources of all members as primary objectives of economic policy", this being the final form in which it was accepted. As Sir Chintaman explained later, "Our case rested on the proposition that poverty and plenty are infectious and if the operation of an international body like that projected was not to grow lopsided, it was necessary to pay special attention to the development of countries like India with resources awaiting development. Our appeal was to enlightened self-interest".

The second objective was to include a provision for multi-lateral conversion of the wartime surpluses of certain countries (India and Egypt, etc. sterling balances). But this was opposed by the developed countries arising out of fear that it might put undue burden on the resources of the

Fund. Despite valiant efforts, it was not accepted. Later Mr. Deshmukh in a speech said that this gives us a chance to plan for our post-war industrial development in a well thought out systematic manner, which is what the Five-Year plans did.

Very persistent efforts led to the contribution of India to the World Bank's Fund such that at last India became one of the top five contributors, automatically becoming a permanent member of the governing body. In all these efforts Mr. Deshmukh kept the interests and goals of a self-governed India in front, despite being under British rule. And, interestingly he took the non-official members of the Central Board along, proving himself to be an excellent institutional man.

This shows the values Of Chintaman-rao. Let me quote a couple of paragraphs from the biographical account (Fragment of a Life) of (late) Dr Hamza Alavi, who was a distinguished Pakistani economist, banker and a liberal political analyst and activist. He writes:

"I had joined the Reserve Bank of India (RBI) in 1945 as a Research Officer on the recommendation of, indeed at the behest of, my supervisor for Ph.D. at the Gokhale Institute at Poona. Professor DR

Gadgil had been asked by RBI to recommend candidates for their research department. He asked me if I wanted the job. When I told him that my aim in life was to make a career in the academic world he said: young man, you had better learn something about life before you start teaching. He pointed out that my starting salary with RBI would be far higher than that of a university lecturer. You can come back to the academic world at any time on your own terms. So, I joined the Reserve Bank in 1945.

"When Partition was announced, Governor Chintamani Deshmukh called me and pointed out that since too few Muslim officers had opted for Pakistan, the State Bank of Pakistan would have great problems without trained officers. It is interesting that a Maharashtrian brahmin was so concerned whether the State Bank of Pakistan would be able to function properly or not. Why should he care? He pointed out that research was a luxury. The State Bank of Pakistan would need people who could do practical jobs. He suggested that I should get some training. So, I was put on a programme of intensive training in the Exchange Control Department".

This shows he was much more than a nationalist, particularly in the very narrow sense it has acquired in recent years. Indeed, his nationalism was much more than what is implied in Jai Hind (which to him meant Jai Bharat and Jai Pakistan).

Not long after the end of his term as Governor, he was drafted as the Finance Minister of the Indian Republic, in which capacity he presented the first budget in February, 1951. He presented in all seven budget speeches, including an interim budget in 1952 on the eve of the first general election. His last was in 1956, presenting the budget for the first year of the second Five-Year Plan period. The budget speech of-course followed the conventional pattern of beginning with a review of the economic scene in the concluding year. But, as I read the six speeches, as an old student and teacher of economics, I was pleased and excited. The speeches are simple, logically sequenced, explaining the developments in prices, production, trade, balance of payments, tax measures, expenditures and their justification. I am sure even the less educated members of the new parliament, with vernacular translations, must have found the budget speech clear to their understanding, helping them ask explanations, raise questions and make suggestions. Those were post-war years of great economic uncertainty, with fluctuating prices, sudden declines in

export and import demand for major farm and non-farm products, affecting sectoral incomes and balance of payments. But the finance minister had a simple way of sequencing and explaining, that makes the listener think he understands. The budget speeches are not burdened with details of the Development Plan since that subject was discussed separately in Parliament. The present-day newspaper reader may be surprised to know how small, in absolute terms, was the total annual revenue or expenditure of the Union; - in 1951 it was 370 crore rupees only. The major cereal crops were in short supply and the country had to depend on imports, mainly from the USA which was willing to help with grains whose sale proceeds were given to India as loans for development expenditure. Our major exports were jute and cotton, both raw and processed. Edible oil, oil-seeds were imported; they still are. Sugar was partly imported; it is now exported with subsidy. Petroleum products did not feature in the budget; to-day they are major source of import expenditure. The economy has greatly changed; that was the goal of planning. Customs duty was a major source of state revenue. The highest slab of annual income of an individual - above one lakh fifty thousand (which to-day is way below the tax exemption limit), was subject to 92.5 per cent tax! And the government earned only one crore from this slab! If the

average income of the income recipients above this slab was ten thousand rupees, then there were only about a thousand people earning this income! Yet Mr. Palkhiwala used to blast the government for this level of taxation. We may be reminded that most developed countries had the highest tax rates above 85 per cent. But Mr. Palkhiwala's regret was that the more than five hundred Raja-Maharajas were paying no income tax nor were the big ex-Zamindars (Zamindaries had been abolished by 1953), since agricultural income was not subject to income tax. What would have Mr. Deshmukh thought if he were to see the present level on high incomes and the tremendous inequality in it in a poor country like India!

Talking about his budget speech I am reminded of his love for Sanskrit literature. In his time, it was a practice for the state finance ministers to send copies of their budget speech to the Union finance minister along with the budget papers. The finance minister of Odisha, in 1952 was also a new member of the Assembly and a new finance minister. On receiving his first budget speech, Mr. Deshmukh wrote to him a personal letter in which besides expressing his happiness with his budget speech, he remarked at the end that he greatly liked his quotation from the Vedas in his budget speech, and said,

I wish I had remembered to quote it in mine. Look at his familiarity with and love for Sanskrit literature.

I had an unexpected opportunity of being introduced to him once. It was some time towards the end of 1956 or beginning of 1957. By then he had resigned from the Union cabinet, in protest against the refusal to form a separate state of Maharashtra. He had built a small house in Poona, across the road from the Deccan college. He used to come there occasionally. Once on a visit, he rang up Prof D R Gadgil to say that he would like to visit him in the institute. He had known Dhanajayrao for a long time; he had as Governor of RBI circulated a note on the Keynes and White Plans by Gadgil in the Central Board of the Bank, and delivered the annual Kale Memorial Lecture of the Gokhale Institute on Central Banking in India. He came to the Gokhale Institute one Saturday morning. Prof Gadgil took him round the Institute, visiting every room to introduce the research workers. In my room I was alone that day. They walked in. Prof Gadgil introduced me as a young staff researcher, specialising in agricultural economics. The mention of agriculture led to a brief conversation between them on India's agriculture for about ten minutes, and I was a fortunate listener. At one stage Chintamanrao said, you know the Planning Commission has planned for a



five per cent annual growth in agriculture for the second plan period. The directors of agriculture of the different States were invited to a meeting and when asked about the plan for their state, every one stood up and said, five per cent! And I am sure, if we had called the district agricultural officers of the country for such a presentation, everyone would have said, five per cent! They laughed and left the room. I was amused and never forgot this remark by him. And, how true he was about the way bureaucracy thinks was illustrated to me over the next 15 years in two different incidents.

The first was relating to the district development plans in Maharashtra under the new (1961) Zilla Parishad Act. Under this revolutionary Act, every district was provided lump sum for all development activities within the district and left to plan for these. We in the Gokhale Institute were receiving copies of the district development plans prepared by the Zilla Parishads. My concerned colleagues and I were amused to find that in the first two years every district divided the total sum amongst different heads in the same proportion in which the Five-Year plan for the state had proposed. It was only from the third year, after some training, that the districts began to plan for their needs, as they thought appropriate. The second was my experience as a non-official member in the Odisha state

Planning Board in 1971. The state was under President's rule at the time. In one meeting of the Board, the Governor, Mr. B D Jatti, who used to attend all meetings of the Board, told the Board that on a visit to Delhi, he was taken aside by the Deputy Chairman of the Planning Commission and told that the Commission had set aside a sum for special development of tribal areas, and since Odisha has a sizeable tribal population, he requested the Governor to send a plan proposal for the purpose in less than three months' time. He also requested Mr. Jatti not to mention it to others, since the sum was limited! The Governor asked the non-official members to submit their ideas and proposals for the purpose. In the next meeting of the Board there was only one non-official note outlining ideas on an approach to the plan for tribal area development. But it turned out that the secretariat had already prepared a plan which was forwarded to the Planning Commission. The Plan was to select the Blocks with a majority of tribal population and the total population of these blocks was multiplied by four times the per capita plan expenditure of the state to constitute the special tribal plan for the state! One wonders how true was Macaulay when he designed an education plan for the country to create copy-clerks!

Macaulay of course was aware that knowledge of English will facilitate access of some to the writings and thoughts of European thinkers. But he did not realise what this might do. It created, in the last hundred years of British rule in India, a veritable renaissance in every linguistic-cultural region of India. Indians were made to learn in English, but they wrote mostly in their own mother tongues. And in literature, arts, socio-political thinking and even religious matters Indians thought, imagined and wrote what even to-day are foundations of modernity. Take only the Marathi speaking area. Here emerged Jyotiba Phule, Lokahitawadi, Dadabhai Nawroji, Mahadeo Govind Ranade, Pandita Ramabai, Lokmanya Tilak, Agarkar, Keshav-suta, Bhandarkar, Gopal Krishna Gokhale, Hari Narayan Apte, Vithal Ramji Shinde, V. K. Rajwade, R. G. Gadkari, Khandekar, Babasaheb Ambedkar, Tarkateertha Laxmanshastri Joshi, Irawati Karve, Durga Bhagavat and many more. Chitamanrao was one of them. In other linguistic regions one can list similar distinguished personalities and their works in different fields. In the present atmosphere of overwhelming retrogression, one has to seek inspiration from these builders of modern India, like Chintamanrao. That is the necessity of this 125th anniversary.

## **NILAKANTHA RATH**

### **BIO-DATA**

1. 1. Born: 1929 in Athgarh, Orissa.
2. B. A. (Hons) in Economics (1949) from Ravenshaw College, Cuttack, Utkal University.
3. M. A. (Economics) (1951) Gokhale Institute of Politics and Economics, Pune and University of Pune.
4. Joined Gokhale Institute as Research Assistant (August 1951)
5. Entire service career in the Gokhale Institute: As RA/Lecturer - 1951-1962, as Reader 1962-1968; as Professor - 1969-1989. As Director - January 1981 to November 1985.
6. As Research Assistant, began work on the Wai Survey data of the Institute.
7. Drafted a Memorandum on the Revision of the Famine Code, for the Maharashtra Central Famine Relief Committee. The memorandum was sent by the committee to the state government of Bombay, November, 1951.
8. Drafted a Note on the Merger of D.A. with the Basic Salary of Government Employees, sent by the Institute to the Committee of the Govt. of India for the purpose, chaired by N. V. Gadgil, 1952.
9. Registered for the degree of Ph. D., 1952.
10. Spent nearly six months scrutinising and commenting on the draft District Monographs of the RBI's Rural Credit Survey, for Prof. D. R. Gadgil. Then redrafted the District Monograph for Puri District, 1952-53.
11. Joined Prof. N. V. Sovani of the Institute in the project to Study the Economic Benefits of the Hirakud Dam Project on the river Mahanadi in Orissa, in early 1954. Moved to Cuttack (Orissa) to be in charge of the field investigations in the rural and urban areas in the Hirakud Command and the Delta regions of the project - June 1954 - July 1956.

12. Drafted a paper (1955) on the formulation of the Hirakud Project, which later became the first chapter of the Hirakud Report.
13. Returned to Pune in July 1956 with the vast body of empirical data collected. Spent the next two years (July 1956 to June 1958) in processing and tabulating the data and drafting the survey result part of the Hirakud Report.
14. Resumed work on my Ph. D. dissertation (July 1958) which had been set aside due to my complete involvement with the Hirakud Survey.
15. Joined the University of Chicago as a Ford Foundation-Gokhale Institute Fellow, January 1959 - March 1961.
16. Submitted my Ph. D. thesis to the University of Poona in October 1959. The Ph. D. Degree was awarded in late 1960. The title of the thesis was, A Critical Review of Research in Agricultural Economics In India.
17. Economic Benefits of a Multi-purpose River Valley Project, (jointly with N. V. Sovani), Gokhale Institute publication, 1960.
18. Presented a paper on Farmers' Response to Price Changes in the Central Provinces and Berar, 1920 - 1944, in the Student-Faculty Seminar of the Dept. of Economics, University of Chicago, March 1961. Also presented it in the staff seminar in the Gokhale Institute of Politics and Economics in June 1961.
19. 'Proposed Land Reforms in Orissa: Some likely Consequences', Artha Vijnana, June 1962. Also in six installments in Oriya in *SAMAJA*, Cuttack, in the later half of 1962.
20. Impact of Assistance Under PL 480 on Indian Economy, (jointly with V. S. Patwardhan), Gokhale Institute publication, 1964.
21. 'Some Problems of Farm Planning in Changing from Monoculture to Diversified Irrigated Farming', in Farm Production Planning and Programming, Seminar series of the Indian Society of Agricultural Economics, 1964.

22. "On Fixation of Price in Agriculture on the basis of Cost of Production", a paper presented in a seminar of the Indian Society of Agricultural Economics at Sardar Patel University, Ballabh Vidyanagar, 1965, and published in *Artha Vijnana*, 1965, and in *Artha Vikas*, 1966.
23. "Relative Movements of Agricultural Wages and Prices: Some Indian Evidence", (jointly with R. V. Joshi), *Artha Vijnana*, 1966.
24. Review of 'The Economic Demand for Irrigated Acreage - New Methodology and some Preliminary Projections 1954-1960', by V. W. Ruttan, *Indian Journal of Agricultural Economics* 1966.
25. Selected the articles from the issues over 25 years of the *Indian Journal of Agricultural Economics*, for the Silver Jubilee volume published by the Society and organised its printing, 1966.
26. "The Co-operative as an Economic Organisation", a paper presented in the Seminar at the Vaikuntha Mehta Institute of Co-operative Management, and later published in the *Co-operative Quarterly*, 1967.
27. Land Reforms in India, a study prepared for the FAO's regional office in Bangkok, 1968.
28. "Benefit-Cost Studies for Development Projects", *Indian Journal of Agricultural Economics*, 1970.
29. *Poverty in India*, (jointly with V. M. Dandekar), a monograph prepared for the Ford Foundation in 1970, published in the *Economic and Political Weekly*, Feb., 1971.
30. Was a member of the Committee to Examine the Implementation of Land Reforms in Maharashtra, 1969-72. Drafted the report of the Committee, which was submitted in 1972.
31. Was a non-official member of the Orissa State Planning Board, 1972-73. Submitted notes, (a) On the Estimation of Agricultural Production in the

- Fifth Plan; (b) A Note on Irrigation (Major, Medium and minor - flow and lift) in the Draft Fifth Plan of Orissa; (c) Approach to formulation of a Tribal Sub-Plan for Orissa.
32. The Current Method of Choosing Irrigation Projects in India - a Review, paper presented in a seminar on the subject at Institute for Social and Economic Change at Bangalore, 1974.
  33. Appointed as One-man Committee on Estimation of Irrigation Pump-sets in India during the Fifth Plan, by the ARDC. Submitted the report in 1975.
  34. Mahadev Govind Ranade on Indian Economic Development, 133rd birth anniversary Lecture, on behalf of the Deccan Sabha, in January 1975.
  35. Jowar in Maharashtra - a Study of Stagnation and Failure, (jointly with B. W. Ashturkar), paper presented to the staff seminar of the Gokhale Institute and submitted to the ICSSR, New Delhi, 1975.
  36. "Economic Development of Orissa", Presidential Address before the Orissa Economic Association in February, 1978, and published in the Orissa Economic Review, 1978.
  37. Worked as Chairman, Committee on Consumer Price Index for Industrial Labour in India, Ministry of Labour, Government of India, 1978-79. Submitted the Report in 1979.
  38. "Measurement of Rural Underemployment in India - a Methodological Note", paper presented before the joint seminar of the International and Indian Economic Associations, 1980, and published in Employment Policy in a Developing Country, ed. by Austin Robinson, P. R. Brahmananda and L. K. Deshpande, Macmillan, 1983.
  39. Member of the Board of Directors, NABARD, 1983-1986.
  40. "Income, Investment and Savings in Rural India", key-note paper presented in the annual conference of the Indian Economic Association, Bangalore, 1983.

41. UGC National Lecturer, 1982-83. Delivered lectures on (i) Agricultural Prices, and (ii) Rural Employment, in three different Universities.
42. Submitted the draft study on Economics of Irrigation in Water-scarce Regions - a Case Study of Maharashtra, (jointly with A. K. Mitra) to the Central Water Commission in 1983.
43. "Garibi Hatao - Can IRDP Do It?", T. A. Pai Memorial Lecture at Manipal in January, 1985. Published in *Economic and Political Weekly* in February 1985.
44. "Prices, Costs of Production and Terms of Trade of Indian Agriculture", Presidential Address before the Annual Conference of the Indian Society of Agricultural Economics at Anand in 1985. Published in *Indian Journal of Agricultural Economics* 1985.
45. "Economics Of Utilisation of Canal Water in Dry Agricultural Regions", (jointly with A. K. Mitra), *Indian Journal of Agricultural Economics*, 1986.
46. Member, Economic Advisory Council to the Prime Minister of India, 1986 and 1987. Submitted a long note on Performance and Problems of Agriculture in India to the Prime Minister on behalf of the Council.
47. (i) Agricultural Growth and Investment in India, and (ii) Institutional Credit for Agriculture in India, two lectures delivered as the Ramaswami Mudaliar Lectures in the University of Kerala in August 1987, and published in the *Journal of Indian School of Political Economy*, Nos. 1&2, 1989.
48. The Monograph, Economics of Irrigation in Water-scarce Regions: A Study in Maharashtra, (jointly with A. K. Mitra) published in full as an issue of *Artha Vijnana*, March 1989.
49. Delivered two lectures on (i) Dry Land Agriculture, and (ii) Rural Employment, in the Karnataka University, Dharwad, 1990.

50. "Higher Education - Plea for Reorganisation", Founder's Day Address at the L. N. Mishra Institute of Economic Development and Social Change, Patna, January 1991 and published in the *Economic and Political Weekly*, March 1992.
51. Non-official Member, Orissa State Planning Board, 1992-95. Submitted five proposals during the period, including (i) Proposal for correcting regional imbalance in Orissa; (ii) Proposal for Tribal Education; (iii) Proposal on Tribal Development and related Forest Policy; (iv) Reorganisation of Irrigation policy in the state.
52. Worked as a Consultant to the Maharashtra Sheep and Goat Commission and submitted a paper "Economics of Goat and Sheep in Maharashtra" 1992; published in the Report of the Commission and in *Indian Journal of Agricultural Economics*, 1993.
53. "Poverty in India Revisited", paper presented in a Seminar on Poverty organised by the UNESCO and the International Association of Social Sciences in Paris in November, 1994 and published in the *Indian journal of Agricultural Economics*, January-June 1996.
54. "Approach to Management and Pricing of Flow Irrigation and Urban Water Supply", paper submitted to the Second Irrigation Commission of Maharashtra, in 1996.
55. "Inequality in the Distribution of Income and Wealth in India", paper presented at a seminar in Turin (Italy) in 1997 and published in *Contemporary India*, edited by V. A. Pai Panandikar and Ashis Nandy, New Delhi, Tata-McGraw Hill, 1999.
56. Five articles on the Central Budget, 1999-2000, in *The Samaja* (in Oriya) in June, and an article in the same paper on Kharif rainfall in Orissa during 1871-1996, and comparison with the kharif paddy yields in the state during the last 36 years of this period.



57. Delivered the Inaugural Address, entitled "Better late than..." in the seminar on Indian Economy in the Millennium" at the University of Bombay in March, 2000.
58. "Data on Employment, Unemployment and Education: Where to go From Here?", key-note address at a seminar on Understanding Human Development through National Surveys, organised by the National Sample Survey Organisation on the occasion of its Golden Jubilee in April 2001, and published in the *Economic and Political Weekly*, June 2001.
59. "Decentralised Statistical System: Report of the National Statistics Commission", EPW 2002.
60. "Fisheries in Tawa Reservoir by Displaced Tribals", *Hindusthan Times*, 2002.
61. Inaugural Address on the Scheduled Caste Situation in a seminar at the Gokhale Institute of Politics and Economics, March 2001, and published in Economic Development of Scheduled Castes, GIPE publication, 2003.
62. "Rama-rajya, Social Values and Adhyatma" the Krushnamohan Pattanayak Memorial Lecture in Cuttack, June 2003; published in the annual number of SAMAJA in July 2003.
63. "D. R. Gadgil on the Co-operative Commonwealth", Gadgil Birth Centenary Lecture delivered at the Centre for Development Studies, Thiruvananthapuram, December 2001, and published in *Economic and Political Weekly*, April 2002.
64. "Gadgil on Planning at the District Level", Centenary lecture at CDS in December 2001 and published in *Economic and Political Weekly*, June 2002.
65. Inaugural Address on the State Economic Survey, in the seminar organised by the University of Mumbai and the Maharashtra State Statistical Bureau, in January 2003. Published in the Proceedings of the seminar.

66. "Linking of Rivers", paper presented at a National Conference on the subject in the Institute of Engineers, Pune Branch, 2003. Partly published in the *Economic and Political Weekly*, in 2003.
67. Submitted my comments and suggestions on the Rural Employment Guarantee Bill, 2004, to the Standing Committee on Rural Development of the Lok Sabha, March 2005.
68. Comprehensive statement on India's Water Future, in response to the ITP's Delphi Questionnaire and published by IWMI-TATA Water Policy Programme in February 2005.
69. "Revival of Co-operatives", *Economic and Political Weekly*, October 2005.
70. "On the Micro-finance Regulation Bill, 2007" in the *Economic and Political Weekly*, September 2007.
71. "Micro-finance Regulation Bill - a rejoinder" in *Economic and Political Weekly*, in May, 2008.
72. "Implications of the Loan Waiver for the Rural Financial Institutions" in *Economic and Political Weekly*, June, 2008. Also published in *Sadhana* and *ArthabodhPatrika* (in Marathi) in 2008.
73. "Current Inflation" in *Journal of Indian School of Political Economy*, 2007, (published in 2008). Also in *ArthabodhPatrika* (in Marathi) in August, 2008.
74. Taught M. A. and later M. Phil. students of the Poona University in the Gokhale Institute, Price Theory and Research Methodology for 27 years. Also taught microeconomics to the B.A. students of the Gokhale Institute for five years, from 1980 to 1985.
75. Received the first Jog Memorial Prize as the best post-graduate teacher of the University, 1989.
76. Received the Nagarkar Prize from the Bharatiya Vidya Bhawan as an economist, scholar and teacher.

77. Published many articles in and translations into Oriya since 1961, This includes the translation of Vijay Tendulkar's one-act play (late) V. K. Rajwade's *Bharatiya Vivaha Sansthecha Itihas*, and transcription from oral record, editing and publication of the first two auto-biographies of a tribal woman and a scheduled caste man from Orissa, "*Mu Sumanee Kahuche*", "*Kharsuanru Koraput*".



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Telephone: 022-40143951; Fax: 091-022-28493724; e-mail: [isaeindia1939@gmail.com](mailto:isaeindia1939@gmail.com) website: [www.isaeindia.org](http://www.isaeindia.org)

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