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APOLOGY

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(July-September 1996 Issue)

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REGIONAL DEVELOPMENTAL DISPARITIES

Easy to Measure, Hard to Cure.

S. M. Vidwans

The paper reviews the work of the Fact Finding Committee (FFC) on Regional Imbalance in Maharashtra, appointed by the Government of Maharashtra in 1983. It brings out the inadequacies of the approach and the procedures for removal of backlog recommended by the FFC and suggests an alternative approach and the necessary procedures for elimination of disparities. The paper analyzes the implications of the new approach for the time-frame and resources for removal of disparities in development, presents certain options in the resolution of the issue of regional developmental disparities and suggests the possible lines on which the issue should be dealt with.

SECTION I

INTRODUCTION

1.1 With the Third Five Year Plan specially taking cognizance of the problem of regional developmental disparities, there had been in India, over the past three decades, abundant action on the part of the Government of India (GOI) to attempt to mitigate the problem of these disparities. Equally abundant had been the active interest in, and writing and research on the subject. Not only had the subject been dealt with by a number of official committees of the Government of India: Pande Committee [1968], Chakravarty Committee [1981], and the National Committee on the Development of Backward Areas [1981], but the Planning Commission and the Finance Commissions increasingly attached greater weight to disparities in development among states in their decisions and recommendations about distribution of funds to and sharing of taxes and revenue with the states. Some social scientists considered the issue to be so grave, and apparently expected it to be so long-lasting, as to establish at New Delhi an independent Society for the Study of Regional Disparities. It held its first Conference on the subject of Centre-State Relationships and Regional Disparities in India in August 1980

and published its deliberations in a book titled *Regional Inequalities in India*.[1] The Planning Commission and the State Planning Institute of Government of Uttar Pradesh organized a special seminar in April 1982 and published the papers presented in it in a weighty book (818 pages) titled: *Regional Dimensions of India's Economic Development*.[2] The subject seemingly provides a sure-fire agendum, not only for livid arguments among politicians, but also for serious deliberations of social research organisations and bodies of people devoted to public cause. The Indian Association for Research in National Income and Wealth was to include this subject in its Conference in 1996. The Centre for New Perspectives,[3] a group of eminent public personalities, held a special seminar in August 1995, to deliberate on: Are Regional Disparities Widening? Research papers on the subject have appeared with perceptible regularity in the economic journals.[4] A political and economic issue, perhaps more the former than the latter, always smouldering and at times burning, it has also thus proved to be intellectually churning for many a researcher.

1.2 If research in or analysis of regional disparities is to be practically useful, it must provide answers to two basic questions: 1) How to measure development and regional disparities in

it and, more importantly, 2) how such a mea-
surement can be used in practice by governments
in their development plans to reduce, if not
eliminate, such disparities. The answer to the
second question must have a demonstrable logical
relationship with that to the first. From this angle,
one may classify the objectives and achievements
of research in this field into three broad types. The
first type, a modest one, devoted itself purely to
the development of a composite index of devel-
opment (CID), of overall development or of its
specific sectors such as social or economic, or its
sub-sectors such as agriculture, industry or edu-
cation. Such CIDs could be useful for *ex post
facto* performance evaluation, or for grading or
grouping regions on a development scale.[5]
Although a large element of subjectivity and
value judgements were inherent in the very
method of construction of the CID, the fact was
not generally explicitly acknowledged. The
second type aspired to go beyond this in the belief,
often mistaken, that the particular CID produced
by it, itself provided the answer to the second
question. But the connection between the par-
ticular CID and the policy prescriptions based on
it was generally tenuous.[6] The *third* type
exemplified the feedback of techniques of mul-
tivariate analysis to the formulation of the prob-
lem, making the solution more technique oriented
than problem oriented.[7] It created, besides the
CID, more such composite indices, simply
because the technique yielded them, and claimed
to discover differences in the processes or patterns
of development.

1.3   In all this, given the spread of knowledge of
statistical methods among social scientists and the
increased availability of computer facilities, the
construction of a CID and the measurement of
disparity on its basis became a relatively easy and,
perhaps therefore, a more popular intellectual
pursuit. The researchers' methods mostly con-
sisted of gathering a large number of development
indicators and combining them into a CID of their
choice and ranking regions on its basis on a scale
of development, with states, districts or tehsils or
their groups taken as units for reckoning regional
disparities. An implicit belief that the more the
number of indicators one used the better the CID
would be as a measure of development, seems to
have guided these exercises.[8] The *choice* of
indicators generally depended on the researchers'

own ideas about what development meant,[9] but
the *number* of indicators limited by the avail-
ability of data. The methods of combining them
into a CID varied from simple ranking and
averaging to complex statistical techniques of
principal component and factor analysis, and to
taxonomy.[10] But what the CIDs or other similar
indices really achieved as bases for the solution
to the problem of reduction of regional disparities
generally remained rather unclear.[11]

Fact Finding Committee of the Government of Maharashtra

1.4   Maharashtra possesses its own internal
problem of regional disparities in development.
In fact, in its very creation in 1960 as a single
linguistic state of Marathi speaking people, the
assurance of removal of disparities in develop-
ment between two of its Regions: Marathwada
and Vidarbha, on the one hand, and the rest of
Maharashtra on the other, was a decisive factor.
Through the successive development plans, the
Government of Maharashtra (GOM) attempted to
reduce the Regional disparities in development,
later (1969) treating the district as a unit for
planning and the reckoning of regions. These
attempts generally took the form of determination
of backlog in financial terms and planning for
proportionally larger expenditure in the lagging
regions. The other way had been to choose some
indicators of development and distribute the Plan
funds on their basis with a certain mathematical
formula which ensured greater *per capita* allo-
cation to less developed districts.[12] However,
these attempts did not appear to have succeeded
much in reducing disparities among the three
regions, and the view gained strength that neither
inter-district disparity had been reduced nor the
question of backlog resolved creating a persistent
demand that GOM should do better than before
in redressing the regional disparities within the
state. It culminated, 23 years after the state's
creation, in the appointment by GOM of a Fact
Finding Committee (FFC), under the Chairman-
ship of late Prof. V.M. Dandekar, to study the
problem and suggest a solution to it. The present
author was, in his personal capacity,[13] one of the
sixteen members of the FFC including its chair-
man.

1.5 The Committee submitted its report in 1984 and its recommendations, it is understood, were used by the GOM in allocating funds to different districts specifically for reducing inter-district disparities in certain sectors and sub-sectors of development. The FFC* also discussed the question of establishment of Regional Development Boards, a persistently popular demand for the resolution of the issue of the development backlog of Marathwada and Vidarbha and an assurance which was given to the people of these Regions at the time of the formation of the state. It analysed the issue and recommended against the creation of such Boards but suggested an alternative and a more effective institutional structure to help achieve the same objective. This was, however, not a unanimous recommendation of the Committee. Later in 1994, three different Regional Development Boards were created by a Presidential Order for Marathwada, Vidarbha and the rest of Maharashtra. The operational definition of the region thus completed a full circle: Region-District-Region.

1.6 In its *Report*, the Fact Finding Committee reviewed the work done on measurement of regional disparities by Committees of Government of India as well as the approach adopted by GOM in its development plans to meet the objective of reduction of regional disparities. But the hallmark of the FFC's work was that it established, unlike most other committees and researchers, a direct link between the measurement of disparities and the actions that a government can take to reduce them. For, the FFC recognised that its function was not merely to measure disparities and add to the research already done on the subject, nor merely to classify districts as backward or otherwise, but also to suggest concrete action for the reduction of regional disparities. The next section explains how the FFC achieved this linkage.

1.7 The purpose of the present paper is to examine the three main elements of the FFC's work and recommendations: 1) the process of removal of backlog under the conditions of resource constraint, 2) the very essence of the process, namely, its continuing nature, and 3) the question of the level at which the term region is defined, that is, unit of measurement, analysis and action. The examination will highlight a particularly very important factor which the FFC did not adequately consider in its analysis of, and conclusions and recommendations on, the whole issue. Showing how the three elements are related with one another, the paper presents policy implications and options that any attempt to reduce developmental disparities must recognise and choose from. In a sense, it attempts to give finishing touches to the approach the FFC developed, although this is done by filling certain gaps and introducing some necessary modifications in that approach.

Organisation of the Paper

1.8 The paper is organised in the following manner. The next (*second*) section briefly describes the FFC's approach and highlights its distinguishing features. The *third* section fully illustrates the implications of the repeated application of the FFC's approach with the help of one of the simplest indicators the FFC used and pointedly brings out one inadequacy in that approach. The *fourth* section attempts to correct the inadequacy of the FFC's approach by taking into consideration the inter-relationship among resources, population growth, and the time-frame and the unit of reckoning for elimination of disparities. It is a complete reconsideration of the whole issue, suggests an alternative approach, and brings forth a few options available in the realistic formulation of the goal of removal of disparities and its attainment. It also points out that, as argued in the Appendix, the FFC's formula for allocation of resources needs a revision and indicates how the allocation should be made. The *fifth* and the last section summarises the conclusions of the preceding two sections and extends them to seven more sub-sectors where the indicator used by the FFC is directly linked to population, and a few more where it is not. It concludes by suggesting a set of options to choose from for reducing disparities in a reasonable time-frame. The Appendix thoroughly makes a statistical examination of the FFC's formula for

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*FFC, 1984; *Report of the Fact Finding Committee on Regional Imbalance*, (Chairman: V.M. Dandekar), April 1984, Second Reprint 1990, Planning Department, Government of Maharashtra, Bombay.

allocation of resources, argues that it needs to be modified, and recommends an alternative method. It fully works out by an illustrative exercise how the allocation should be made to meet the ends of fairness and justice. The paper gives at the end two mathematical notes whose results are used in the paper, and notes on some points in the paper in their support or for further information on them.

1.9 A reader who wants to come to grips with the main issues may skip sections III and IV and go directly to section V and, if need be, return to the skipped sections. A more enquiring reader may want to be satisfied about the correctness of statements and conclusions in section V and will have to read the sections *seriatim*, the Appendix, and the mathematical notes.

Limitations

1.10 The paper, like the FFC's Report which it essentially reviews, deals with matters of operational significance. Of the several issues of regional disparities, those that attract policy decisions, such as for industrial backwardness and representation in services, are not covered by it. The paper pertains to only those sub-sectors of development which the FFC dealt with by its backlog removal process by allocation of plan funds. Even then it does not go into the substance of indicators the FFC used in its work for these sub-sectors, or comment on their suitability, or suggest alternatives for them. Further, it deals with only some of such sub-sectors, as its objective is to re-examine the FFC's approach and not to fully substitute its exercise. For the same reason, the paper uses the results and data given in the FFC's *Report*. The only exceptions are the 1991 Census population figures and the number of primary teachers which were needed for illustrative purposes only. Although the paper discusses the Seventh Five Year Plan outlay figures given in the FFC's *Report*, those figures were not of actual outlays but were, as the FFC acknowledged, 'speculative' because the Seventh Plan was then at an early stage of formation [FFC, 1984, Para 17.27]. But the paper does not use the figures of actual outlays of that Plan in order to retain its relationship with the FFC's work. The paper thus does not attempt to update the FFC's

calculations based on latest data. Its orientation is to present such results and conclusions which, had the FFC noticed the magnitude of the effects o^ the inter-relationship of the factors that the pap brings out now, it would itself have reached.

Apologia

1.11 Instruments and ability to use them are sometimes as important as intentions to achieve a goal. The author was able to do the present work because of the easy access to computer facility and his acquired ability to use it, something not available to him a decade ago. Nevertheless, he admits that for him, who was one of the expert members of the FFC, the paper is a self-correcting statement on what he ought to have noticed, and brought to the FFC's notice, but did not. It is a long time that the FFC completed its work; the recently renewed formal involvement of the author[14] with the issue prompted him to take a fresh look at this twelve-year old work. The paper is a product of this review and re-examination.

SECTION II

APPROACH OF THE FACT FINDING COMMITTEE

2.1 Both the Pande Committee [1968] and Chakravarty Committee [1981] classified and identified backward districts in India although they used different sets of indicators and methods of combining them in a composite index of development.[15] The FFC's approach differed from both these because its objective was not so much to classify and identify districts as backward or non-backward, but to examine in operationally meaningful terms disparities in development wherever they existed in each sector of development [FFC,1984, Para 3.26]. Although the FFC shared the views of the National Committee on the Development of Backward Areas (NCDBA) [1981], it delved deeper into the issue than the NCDBA's suggestion to identify broad sectoral backwardness, such as agricultural or industrial. It did not take upon itself the task of suggesting a programme of greater general development of backward districts. The requirement to chart an operationally meaningful course of action for reduction of disparities dictated the

FFC's approach right from the choice of indicators to-be selected for the purpose to the method of their use to achieve the objective.

2.2 Further, until the FFC's *Report*, development backlog had been understood in Maharashtra in financial terms, that is, in terms of the amount of development expenditure incurred in different areas. As experience had amply shown before, expenditure by itself does not bring about the expected development. The FFC, therefore, measured disparities or backlog in physical terms, that is, in terms of quantifiable government action that had taken place, and that should consequently follow. Based on such a physical measure, the FFC could then quantify the amount of additional action to be taken by the government to reduce disparities. Since all government activity finally needs to be funded, it is only at that stage that the FFC converted the measure of physical disparity or of backlog to be removed in financial terms. The FFC thus directly tied down the financial input into a region to the specific physical development that should take place in it.

Main Features of FFC's Approach

Definition of Region and Indicators

2.3 The FFC adopted the district as the unit of analysis and recommendations, that is the definition of the region, as was specified in its terms of reference. It gave careful consideration in the study of disparities in every sector to the choice of indicators to ensure that the indicators were consistent with its objective. The mutually connected elements of this consideration are explained below.

2.4 Every indicator, for example, the number of teachers per lakh population, is a ratio of two quantities: one in the numerator and the other in the denominator. The indicator has to be a ratio because regions are not of the same 'size', either in terms of area or population, or in terms of some other relevant measure. (If they were so, we do not need the denominator; only the measure in the numerator would suffice for comparison of regions.) To compare the regions in terms of what goes in the numerator, it has to be expressed as a ratio to the 'size' in the denominator. There is little

problem in choosing an appropriate measure as a denominator so long as it is consistent with the regional development objective, namely, whether it is the regions' people or certain groups among them, or the regions' land of different types, whose development one aims to bring about.

2.5 The real questions arise in the case of numerator, the measure of development, and in choosing it the FFC ensured that it satisfied the following conditions:

i) Since reduction in inter-district disparities should mean bringing about specific material changes in the lagging districts, the numerator should be a measure of physical development. Only then would it be possible to unambiguously measure development and disparities in it in real terms and to monitor the success of attempts to reduce disparities in successive Five Year Plans.

ii) Some development indicators measure the final results or effects of development, for example, those of income, literacy, enrolment in schools, and secondary or tertiary employment. Most researchers analyse this type of indicators. But development measured by them is a product of several factors among which government action might be just one. Such indicators and their analysis do not provide any clue to what precisely the government should do, nor about how much effect governmental action would have on the values of the indicators. They have, therefore, no operationally useful role in linking specific government actions and a certain reduction in developmental disparities. The FFC therefore did not use such indicators. On the other hand, indicators which measure the provision of services and creation of infrastructure, for example, irrigation, roads or educational facilities, which may be considered as agents of development, are useful for two reasons. One, they are operationally meaningful as they directly spell the action that is needed, and two, only in their respect, removal of disparity has a realistic meaning. For if, even after elimination of disparity in their respect, regions are found to differ from one another, the reasons for the same have to be traced to

other factors beyond the control of government. It is the second type of indicators that the FFC used in its work.

iii) Even then, in certain spheres and fields of development, (for example, health and education) in addition to government's creation of infrastructure and facilities, a considerable part of such activities takes place on people's own initiative. The FFC segregated the two clearly and took into account only what the government does or can do. In the field of education, for example, it therefore considered the number of teachers and other infrastructure in government educational institutions or those funded or aided by it as the numerators for the indicators [FFC, 1984, Para 3.29]. The government is responsible only for what it could achieve in this regard. Therefore, the numerators denoted and measured only that aspect of development which is the direct responsibility of the government.

2.6   In selection of indicators, therefore, the FFC carefully examined several indicators and chose only those which were consistent with these considerations. In other words, indicators should measure what the government has done, and should and could, in future, do. This alone would be germane to the attempts by the government towards reduction of disparities. The FFC used measures of only such activities in the numerators of its indicators and showed how the government can plan a concrete programme for reduction of disparities in respect of those activities.

2.7   In sum, the numerator of the indicator to be used in the case of every government development activity should reflect a measure of the provision of services and creation of infrastructure that the government can make. Once an indicator is chosen in this manner, it becomes possible to measure the existing regional disparities in its terms and, more importantly, also to measure what and how much should be done by the government and how much it would cost to reduce disparities among the regions. Both the aspects of the problem, namely, the measurement and reduction of disparities, are thus logically tied

up in this approach based on a clear arithmetic. And because it is known in advance that they are so tied up, the physical targets and the corresponding financial input can be correctly estimated.   This alone makes it possible to continuously monitor whether the expenditure incurred on its basis and the achievements made are in conformity with each other.

Backlog Removal Process

2.8   Having thus selected an appropriate indicator for every one of the 29 sub-sectors of the GOM's development programme (listed in Table 7, Section V), the FFC worked out the district level values of the indicator and its state level average. A district whose indicator value was below the state level average was called a backlog district and (the size of) its backlog was determined by the quantity by which its numerator should be increased to make the district's indicator value equal the state level average. An aggregation of such districtwise backlog figures gave the total backlog in that sub-sector. This was converted into financial terms by using appropriate cost norms. The FFC used the 1981 Census population figures and 1982-83 achievement figures in most cases for the above calculations.

2.9   The FFC also worked out the extent to which the backlog identified by it could be removed during the Seventh Five Year Plan. *In this and its entire work the FFC considered the resources for a particular sub-sector as given* [FFC, 1984, Para 3.34]. *It recommended that all the resources planned to be spent in the sub-sectors identified by it should be allocated for the purpose of removal of backlog in those sub-sectors.* But since some of the works would be on-going and some allocation needs to be made for 'natural growth', the FFC considered it reasonable to allocate 15 per cent of the resources for such on-going works or for 'natural growth'. It, however, specified that the allocation for natural growth when made should be distributed over both backlog and non-backlog districts, that is, over all the districts, in proportion to their population [FFC, 1984, Para 17.24]. The allocation

for the removal of backlog was to be made over only the backlog districts in proportion to their backlog. At the beginning of the next plan, the whole position was to be reviewed and the exercise repeated, because after one plan, the indicator values will change and so will their average, the classification of districts as backlog and non-backlog districts, the size of backlog of the former districts, and the total backlog. The same formula will be applied to allocate over the districts the resources available for the particular sub-sector in the next Plan. The process of removal of backlog will be thus continued plan after plan till disparity is eliminated in the particular sub-sector. 2.10 Consistent with its approach, the FFC expressed *its inability to give a time-bound programme for removing the then present disparities.* In explaining this inability, it pointed out that the time required to bring up the lagging areas to the state average will depend upon sectoral allocations and the size of the backlog. But the fundamental reason given by it was connected with its approach, namely, that *the concept of lifting the districts below the state average up to the state average is not a programme to be completed in given a time but a continuous process* [FFC, 1984, Para 3.37].

2.11 The unit of analysis and recommendations, that is the definition of the region, adopted by the FFC was a district as specified in its terms of reference. However, the FFC went further in its analysis and came to the conclusion that even the unit of analysis or the definition of the region could be changed for a particular sector of development depending upon the development that has taken place in it. It emphasised that the analysis done by it should be done and attempts to reduce disparities made by considering a unit lower than the district, i.e., a *taluka* (or *tehsil*) [FFC, 1984, Para 3.36]. Further, the FFC went on to recommend that its exercise should be extended to more sectors and sub-sectors [FFC, 1984, Para 17.37].

Significance of FFC's Approach

2.12 Till the appointment of the FFC, the issues

of regional disparities had been dealt with, by committees and researchers alike, by identifying backward regions and suggesting general programmes for their development. The link between the two: the basis of identification and the particular action in terms of specific development programmes, was conspicuous by its absence. For, even if the suggested programmes were carried out, there was no assurance that the intended development would materialise, nor that it would do so by the required extent, nor further that a later analysis using the new values of the same indicators and the methodology of combining them as before would cease to classify the erstwhile backward districts as backward, nor certainly that disparities will be reduced for the simple reason that the advanced districts would continue to progress independently of government's actions. The FFC scrupulously avoided this approach, and by turning the focus of attention from the financial to the physical, addressed itself to physical specifics of development. From its approach followed not only the determination of physical targets to be achieved but also a clear and sure method to monitor the process of change to ensure that it is achieving the desired goal.

2.13 It is easy to see that the FFC transformed the meaning of the term, backlog, as is generally understood and as had a specific historical meaning in Maharashtra, into a concept of disparity. In doing so it removed from the meaning of the term, backlog, any element of subjectivity and defined it in purely objective, well-defined statistical terms. But it also made a fundamental change. For, if backlog is considered as a static phenomenon expressed in certain fixed quantitative terms, the process of its removal must come to an end after its removal. But the conceptual transformation that the FFC made also changed the character of the backlog removing process from a once-for-all action into a continuous process that will end at some future date [FFC, 1984, Para 17.37]. Although the FFC continued to use the term backlog, it thus changed its meaning and widened its scope by equating it to disparities in development, and made the process

of its removal a continuing one.

2.14 It appears that the FFC was carried away by the confidence in the merits of its approach in as much as it believed that the *continuing* process of reducing disparities in development will 'emerge as an alternative strategy of development, namely, development by lifting the bottom rather than pulling up the top' [FFC, 1984, Para 17.37]. In that belief, it further went on to recommend that its approach should be extended both laterally and vertically, laterally by considering as many sub-sectors of developments as possible (in addition to the 29 sub-sectors it covered), and vertically by using units lower than the district as regions for the purposes of measuring and planning for the removal of corresponding inter-regional disparities.

Inadequacy of FFC's Approach

2.15 But it did not apparently fully recognise the serious consequences of the one important limitation under which it had to work, and did not also adequately take into account the vital factor of population growth. Reduction of disparities can be achieved in two ways: redistribution alone; or growth and redistribution. Since the first alternative was out of question - one cannot pull down schools in one region to build them in another - only the second choice is left. That means enough growth before *appropriate* distribution of the incremental gains is made to reduce disparities. But with a given amount of Plan resource, the rate of growth is predetermined, which in turn determines the time-frame for achieving the goal of elimination of disparities. Add to this the factor of population growth, and the attainment of goal is pushed that much further into future. The remaining sections show how serious the consequences are of the FFC's greater concern with distribution than with growth. Prudence may dictate an assimilation of the reality of limited resources, of growing population and of the need for thinking about a reasonable time-frame for ending this long-standing issue of regional disparities, and a reconsideration of the purely arithmetical concept of disparity in

the formulation of the issue itself, before one embarks upon the laterally and vertically extended course of action pursuing the FFC's approach.

SECTION III

FFC'S BACKLOG REMOVAL PROCESS

Clarification of Terms

3.1 Before proceeding with the discussion in this paper, a small clarification of terms used in it is necessary for clarity of meaning. The term *backlog* will be employed in the sense the FFC used it, that is, always in relation to the overall average value of an indicator. Thus a backlog district will mean a district whose indicator value is less than the overall average, the (amount of) backlog of such a district equals the amount by which the numerator of its indicator value needs to be increased so that the indicator value will be equal to the overall average, and the total backlog will be the total of such districtwise backlogs. On the other hand, the term *disparity* will be used in a purely statistical sense and would encompass *all* districts in its meaning and measurement.

FFC's Backlog Removal Process Illustrated

3.2 I shall illustrate the process recommended by the FFC for removal of backlog in each sector with the help of one of the simplest among the indicators the FFC used. It refers to the development of primary education, and the indicator was the number of primary teachers per lakh of population. In the calculation of this indicator, consistent with its approach, the FFC took into consideration only the teachers in the government and government-aided primary schools. It used the data for number of teachers for the year 1982-83 and the 1981 Census population figures. Table 1 gives this information for the 25 (then existing) districts of Maharashtra, excluding Greater Bombay.[16] The Table also shows the stages of calculation involved in the FFC's calculation of backlog and its recommended procedure for its reduction and, ultimately, removal.

3.3 Even this direct and simple indicator has limitations as a basis for measuring disparity or backlog. First, the term 'primary' teacher does not

have the same meaning across the districts, for, it applies to teachers in schools which have standards I to IV only, as well as to teachers in schools which have standards I to VII.[17] A part of the disparity is explained by the varying proportion of schools of the two types in different districts. But if the ultimate aim is to define primary education as one up to standard VII, this varying proportion of types of school does not count as a limitation to the use of the indicator to measure backlog or disparity and for the process of their removal.

TABLE 1. FFC's PROCEDURE FOR REDUCTION OF DISTRICT LEVEL BACKLOG OF PRIMARY TEACHERS IN MAHARASHTRA DURING VII FIVE YEAR PLAN

Indicator(Ind) : Number of Primary Teachers Per Lakh Population

ADDITIONAL NUMBER OF TEACHERS DURING VII PLAN = 10,552

Sr. No.	District	Population 1981 (lakh)	IND	Teachers 1982-83	Back-log	Allocation for Natural Growth (15%)	Allocation for Backlog (85%)	New IND	Growth in Population in five years (%)	IND after five years
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.	Ratnagiri	21.11	592.43	12,506	0	61	0	595	5.0	567
2.	Satara	20.39	472.46	9,633	0	59	0	475	9.6	434
3.	Raigad	14.86	470.31	6,989	0	43	0	473	10.5	428
4.	Sangli	18.31	443.20	8,115	0	53	0	446	9.8	406
5.	Kolhapur	25.06	395.20	9,904	0	73	0	398	10.1	361
6.	Ahmednagar	27.08	393.46	10,655	0	79	0	396	11.6	355
7.	Jalgaon	26.18	392.78	10,283	0	76	0	396	10.3	359
8.	Amravati	18.61	379.98	7,071	0	54	0	383	8.7	352
9.	Solapur	26.10	375.46	9,800	0	76	0	378	11.7	339
10.	Wardha	9.27	366.82	3,400	0	27	0	370	7.3	345
11.	Nashik	29.92	364.67	10,911	0	87	0	368	13.5	324
12.	Pune	41.64	359.42	14,966	217	121	151	366	15.3	317
13.	Akola	18.27	357.81	6,537	125	53	87	365	10.1	332
14.	Osmanabad	22.31	357.79	7,982	153	65	106	365	12.7	324
15.	Yavatmal	17.37	357.02	6,201	132	50	92	365	9.3	334
16.	Buldhana	15.09	345.84	5,219	284	44	197	362	11.8	324
17.	Dhule	20.50	343.90	7,050	425	59	296	361	11.2	325
18.	Aurangabad	24.33	326.21	7,937	935	71	651	356	16.9	305
19.	Chadrapur	20.56	321.02	6,600	897	60	624	354	11.6	317
20.	Bhandara	18.38	319.93	5,880	822	53	572	354	7.1	330
21.	Nagpur	25.89	311.73	8,071	1,370	75	953	351	12.7	312
22.	Thane	33.52	292.76	9,813	2,409	97	1,676	346	25.1	276
23.	Nanded	17.49	285.54	4,994	1,383	51	963	344	15.4	298
24.	Beed	14.86	280.41	4,167	1,252	43	871	342	13.6	301
25.	Parbhani	18.29	228.71	4,183	2,486	53	1,730	326	13.5	287
	Total/Average	545.39	364.64	198,867	12,890	1,583	8,969	383.98	12.5	341.65
	For AA Districts	236.89	419.04	99,267	0	688	0	421.95	10.2	382.90
	For BA Districts	308.50	322.85	99,600	12,890	895	8969	354.83	14.1	311.04
	Std. Deviation		69.2					54.6		57.1
	Coeff. of Variation		19.0					14.2		16.7

Notes: AA means above average and BA means below average.
Col.(7) : 15 per cent of 10,552 distributed according to population in col.(3)
Col.(8) : 85 per cent of 10,552 distributed according to backlog in col.(6)

3.4 The second limitation is more important. It is understood that the official statistics report number of teachers in post and not the number of sanctioned posts and thus exclude vacancies. They therefore do not reflect the 'capacity' created to deliver the services of primary education in different districts. Two consequences follow: A part of inter-district disparity may be due to the differing proportion of vacancies in different districts. Further, the calculation of additional number of teachers needed to reduce disparities is likely to result in overestimates. All this shows that appropriate statistics should be available and then used in the exercise to indicate precisely the magnitude of the action that has to follow.

3.5 I have ignored these limitations in what follows, for they do not affect the substance of the conclusions of the paper. I have also ignored the difference in the reference years of the number of teachers (1982-83) and the population figures (1981) which means that the actual indicator values for all districts were, in fact, all less by varying extent than what the FFC *Report* showed.

3.6 The districtwise indicator values shown in the table are taken from Table 9.3, Column (4) of the FFC's *Report*, and the population figures from Table 6.4 of that *Report*. Using these two sets of basic figures I have derived all figures in this paper starting with the state level totals and the averages.

3.7 A note about the numerical results must be entered at this stage. The derived figures have been worked out with seven-digit accuracy although, to save space, rounded figures are shown in the tables. Some minor differences may be noticed between the derived figures in this paper and those in the FFC's *Report;* between the actual totals and the figures shown as totals; and, between the same figures appearing in different tables in this paper when they were calculated in different ways. All such differences have resulted due to rounding of numbers at different stages of calculations, and sometimes due to their cumulative effects. No attempt is made here to remove such inconsistencies.

3.8 The presentation in Table 1 differs from that in the FFC's *Report* in one important respect;

while the latter showed the districts in the officially recognised order, which has the Regions as the first level of classification, Table 1 shows the districts arranged in a descending order of the value of the indicator to help understand easily the process of removal of backlog by the procedure suggested by the FFC. But to identify the regions to which the district belongs, information for the Vidarbha districts has been shown in *italic* and for the Marathwada districts in **bold** print. The table also shows for every column the averages and totals where appropriate, classified by above- and below-average districts, and the statistical measures of disparity.

3.9 The number of teachers shown in Column (5) is obtained by multiplying the population in lakh in Column (3) and the indicator value in Column (4) and rounding the result to the nearest integer. The average indicator works out at 364.64, Column (4) bottom line, which equals the total number of primary teachers in Column (5) divided by total population of the 25 districts shown in Column (3). It is also the weighted average of indicator values with population as weight.

3.10 The non-zero values of backlog are given in Column (6) for those districts whose indicator value was less than 364.64, i.e., Pune, Akola, etc., down to Beed and Parbhani. We see from the table that of the 25 districts, 14 had backlog. The amount of backlog for any backlog district equals the number of teachers that need to be added in that district so that the indicator value of the district will equal the state average of 364.64. Thus, for Parbhani with indicator value of 228.71, and a population of 18.29 lakhs, one needs

$$18.29 \times (364.64 - 228.71) = 2,486$$

additional teachers to be appointed in that district to make its indicator value 364.64. The figures under the column of backlog are thus worked out for the 14 backlog districts. One would notice that the size of the backlog for a district is directly proportional to two quantities: 1) the population of the district in this case, and generally the 'size' in terms of the variable used in the denominator of the indicator, and 2) the difference of the indicator value from the state's average. The total

amount of backlog, which is an aggregate of the districtwise backlog, works out at 12,890 teachers. (By the FFC's calculation, the backlog worked out at 12,853 teachers.) In other words, if one has the resources to appoint these many teachers immediately and appoint them district-wise according to their number shown in Column (6) of the table, the indicator values of all the 14 backlog-districts could be raised to the state average of 364.64. This obviously does not mean elimination of disparity because 11 of the 25 districts will continue to have indicator values above 364.64.

3.11 However, one might not have always adequate resources to achieve this state even though the total backlog forms only 6.5 per cent of the existing stock of primary teachers. The FFC made a calculation, based on the resources that would be spent during the Seventh Five Year Plan (Table 17.2) and came to the conclusion that only 69.78 per cent of the backlog of 12,853 teachers calculated by it could be made up during the Seventh Five Year Plan.[18] This works out at a figure of 8,969 teachers for removal of backlog. But since this forms, as recommended by the FFC, 85 per cent of the total number of primary teachers that would be appointed during the period of the Seventh Plan, the latter number therefore works out at 10,552.

3.12 The FFC further recommended that of this total number of teachers, 15 per cent, that is 1,583 in this case, should be allocated to *all* districts, both backlog and non-backlog, for natural growth in proportion to their population. The Table shows this distribution under Column (7). Thus for the district of Ratnagiri the allocation works out at

$$1583 \times (21.11/545.39) = 61 \text{ teachers}$$

The figures so worked out for every district, which are rounded to their integral value, add up to 1,583.

3.13 The 8,969 teachers are to be allocated only to the 14 backlog districts. The FFC recommended that this allocation should be in propor-

tion to the backlog of the districts. Thus, for Parbhani the allocation of additional teachers on account of backlog works out at

$$8,969 \times (2486/12890) = 1,730$$

With the districtwise allocation of the additional 10,552 teachers thus made to the districts, for natural increase and on account of backlog, the new values of the indicator for all districts can be worked out by totalling figures from Columns (5), (7) and (8) and dividing the total by the population in Column (3). Thus, for Parbhani district the new indicator value would be

$$(4,183 + 53 + 1,730 = 5,966)/18.29 = 326.19$$

and for Ratnagiri,

$$(12,506 + 61 = 12,567)/21.11 = 595.31$$

The new indicator values are shown in Column (9) of the table. Obviously, they are all higher for *all* districts than the corresponding initial values in Column (4), the increase being greater for the backlog districts than for the non-backlog districts, and among the former for the more lagging districts than others of equal population.

3.14 The new state average of the indicator works out at 383.98, nearly 20 points higher than the initial average. The standard deviation, a statistical measure of disparity, goes down from 69.2 to 54.6 primary teachers per lakh population. Since the average also changes, we need to relate the standard deviation to average by a percentage ratio which is called coefficient of variation, CV for short. The CV decreases from 19.0 per cent to 14.0 per cent, showing a significant reduction in inter-district disparity.

3.15 The FFC recommended that this procedure should be repeated at the beginning of the Eighth Plan after working out the new indicator values based on updated data and going through the same arithmetic. In this, the average itself would have changed and so would the backlog because of an additional reason of all indicator values having also changed. With additional resources put in every Plan, the average indicator value at the state level would go up, but it would do so by increasing by larger amounts the indicator values for districts

lagging behind. Continuing in this manner, the process, it was believed, and hoped, would eliminate districtwise disparities in this indicator over time.

Simulation of FFC's Approach (I)

3.16 But time is the important factor the FFC did not fully consider. For, by the end of the Seventh Plan, population would have increased. Column (10) of the table shows the percentage by which every district's population would have grown in five years. These figures have been worked out on the basis of the actual average annual growth rate of population of a district observed between the population Censuses of 1981 and 1991, assuming a geometrical growth (that is, in simple terms, a compound interest) model. By 1991, the number of districts in Maharashtra had increased to 30 including Greater Bombay. The population Census figures for 1981 and 1991 Census are available for the new districts. For working out the districtwise growth rates for the old districts, the population data (both for 1981 and 1991) for the new districts of Osmanabad and Latur, of Aurangabad and Jalna, and of Chandrapur and Gadhchiroli, have been pooled together to stand for the old districts of Osmanabad, Aurangabad and Chandrapur, respectively.[19][20]

3.17 Using these figures of percentage growth in its population for every district, those of the population at the end of five years are worked out. The new indicator values are calculated, as explained in paragraph 3.14, on the basis of the new figures of population, and are shown in Column (11). In simple terms, the values in Column (11) for every district are deflated values of those in Column (9) to adjust the latter for growth in population in five years in every district.

3.18 The remarkable feature of the indicator values in Column (11) is that for all non-backlog districts, the indicator value shows a decline. This was not unexpected by the FFC nor the reason difficult to see. The non-backlog districts get additional allocation only on account of, what the FFC called, 'natural growth'. But this is grossly insufficient in relation to their population growth. For example, Raigad district, with 10.5 per cent

growth in its population, needed that much percentage increase in its initial stock of teachers (6,989), or an increase of 736 teachers, if its initial indicator value of 470.31 was to remain unchanged. But it gets only 43 additional teachers in five years pulling its indicator down by 42 points (nearly 10 per cent) to 428.

3.19 But the surprising part is that even for the majority (9) of the backlog districts the indicator values decline at the end of five years. The reason again is not difficult to see. If we consider all backlog districts together, their initial stock of teachers is 99,600 and they get 8,969 additional teachers on account of backlog, and 895 on account of 'natural growth' giving a total of 9,864 additional teachers, which is 9.9 per cent of their initial stock of teachers. This is a much smaller percentage than the one (14.1) by which their population increases in five years. The exceptions are the districts of Bhandara, Nagpur, Nanded, Beed, and Parbhani. In these five districts, the additional number of teachers forms a greater percentage of their initial stock of teachers than the percentage by which their population grows. But, even this, as we shall soon see, will be a short-lived phenomenon. The net result of all this is that the state average of the indicator declines from 364.64 to 341.65 which can hardly be called development.

3.20 Incidentally, but importantly, we may note an interesting facet of the situation Column (10) reveals. It is that the growth rate of population of backlog districts in Maharashtra is perceptibly higher than that of the non-backlog districts even if we leave aside the urban districts of Pune and Nagpur. The growth rate of the Marathwada districts is on the high side and of those of the Vidarbha on the low.

3.21 I have attempted to see what the scene would be like if, plan after plan, the FFC's recommended procedure is implemented. Table 2 gives the results over a long period of 60 years, showing the initial situation and the one that would be attained at the end of 10, 20, 30, 40, 50, and 60 years, respectively. To do this exercise two things need to be known: one, the population growth rate for every district, and two, the resources in terms of primary teachers that will be available. I have made the following two assumptions about them:

i) The population of every district will grow

at the same rate as it did on average from 1981 to 1991;

ii) In the first five year period (Seventh Plan) the additional number of teachers was 10,552, which was 5.306 per cent of the initial stock of

teachers. The additional number of teachers in the successive five year periods will grow at the same rate which is equivalent to a decadal growth rate of 10.89 per cent.

TABLE 2. SIMULATION OF FFC'S PROCEDURE FOR REDUCTION OF DISTRICT LEVEL BACKLOG OF
PRIMARY TEACHERS IN MAHARASHTRA
Indicator : Number of Primary Teachers Per Lakh Population

PROCEDURE APPLIED FOR A FIVE YEAR PERIOD AT A TIME*
ADDITIONAL NUMBER OF TEACHERS: 10,552 IN THE VII PLAN, GROWS IN SUCCESSIVE PLANS BY A FACTOR OF 1.05306

Sr. No.	District	Initial	Indicator Values At the End of Year Number					
			10	20	30	40	50	60
(1) (2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Ratnagiri	592	542	496	454	414	379	346
2.	Satara	472	398	336	283	238	201	169
3.	Raigad	470	390	323	268	223	185	154
4.	Sangli	443	372	313	263	221	186	157
5.	Kolhapur	395	331	277	238	206	176	149
6.	Ahmednagar	393	321	271	236	204	174	148
7.	Jalgaon	393	327	275	238	205	176	149
8.	Amravati	380	326	280	241	208	178	153
9.	Solapur	375	308	270	236	204	174	148
10.	Wardha	367	324	285	252	222	195	172
11.	Nashik	365	301	266	233	201	172	146
12.	Pune	359	295	262	230	199	171	145
13.	Akola	358	311	274	238	206	176	149
14.	Osmanabad	358	303	268	234	202	173	147
15.	Yavatmal	357	314	275	240	207	177	150
16.	Buldhana	346	305	270	235	203	174	148
17.	Dhule	344	307	271	236	204	175	148
18.	Aurangabad	326	289	259	227	197	169	144
19.	Chadrapur	321	305	270	236	204	174	148
20.	Bhandara	320	320	283	251	222	196	173
21.	Nagpur	312	301	268	234	202	173	147
22.	Thane	293	266	244	216	188	162	138
23.	Nanded	286	292	262	229	199	170	145
24.	Beed	280	297	266	232	201	172	146
25.	Parbhani	229	295	266	232	201	172	146
Average		364.6	319.7	278.6	241.3	207.5	177.0	149.8
Std. Deviation		69.2	50.7	42.3	36.7	32.4	28.8	25.6
Coeff.of Var.(%)		19.0	15.9	15.2	15.2	15.6	16.2	17.1
Population (lakh)		545.39	689.88	877.75	1,124.00	1,449.56	1,884.06	2,469.79
*Growth in Pop.(%)**		...	*26.5*	*27.2*	*28.1*	*29.0*	*30.0*	*31.1*
Backlog		12,890	10,342	9,398	9,313	9,504	10,017	10,913
Total Number of Teachers		198,867	220,530	244,555	271,190	300,727	333,509	369,843
*Growth in Teachers (%)**		...	*10.9*	*10.9*	*10.9*	*10.9*	*10.9*	*10.9*

* See paragraph 3.22
** Growth during the past decade

The FFC's procedure is then carried out to give results at the end of every five year period; that is, the new backlog calculation and allocation of planned resources is made at the beginning of every successive five-year period. For the sake of saving space, the table shows results for 10-year periods. Further, all through, following the FFC's recommendation, the allocation on account of 'natural growth' is fixed at 15 per cent, to be distributed over *all* districts in proportion to their population at the beginning of the five year period.

3.22 An important aspect of the FFC's procedure must be mentioned at this stage. The FFC's backlog removal formula (paragraph 3.13) applies only if 85 per cent of the available plan resources (in physical terms) are less than the size of total backlog. When this is not so, the FFC recommended that the calculation be done for every annual plan [FFC, 1984, Para 17.29]. In the present case, starting from the fourth plan, the latter becomes the situation. Therefore, calculations were done year by year after the 3rd plan using equivalent yearly resources that would be available with the same five-year growth rate.

3.23 The results, to say the least, may appear unexpected, if not shocking, but easily explicable. At the end of the first ten year period, the indicator values of all districts, non-backlog districts expectedly and all backlog districts except for Nanded, Beed and Parbhani, unexpectedly, are less than their initial values. This decline continues and by the end of the 20th year, the indicator values are less than the initial ones for all districts except for Parbhani. By the end of the 30th year Parbhani almost returns to its original level and then joins all the rest in the continuing downward slide. *Only as a result of this decline*, sharply for the non-backlog districts and less so for the backlog districts, by the end of the 60th year, *disparities among districts between Kolhapur (5th from top) and Parbhani (initially at the bottom) become almost negligible*, except for some few districts, but the state average indicator becomes less than half of its initial value. *To call this development can be only algebraically correct.*

3.24 The standard deviation goes down from 69.2 to 25.7 (teachers per lakh population), and

the coefficient of variation (CV) first declines from 19 per cent to 15.3 per cent at the end of the 30th year and then climbs up to 17.1 per cent by the end of the 60th year due to the decline in the average. Thus neither development nor much great reduction of disparity takes place in the process.

3.25 The simple reason for this rather bleak prospect projected by repeated application of the FFC's procedure is easily traced to the growth in the additional resource being out-paced by that in population. The table shows the population and the total number of teachers at the seven points of time and the decadal growth rates in the two. While resources grow at a fixed rate of 10.89 per cent in ten years, the population grows by 26.5 to 31.1 per cent per decade in the six decades.[21] The consequences of the downward slide of all indicator values and of the average logically follow from the inadequacy of resource to begin with as well as of its growth rate.

Simulation of FFC's Approach (II)

3.26 The reality, however, was not, and hopefully would not be, so dismal. For the actual additional number of primary teachers was much larger than what the FFC reckoned. The government's education statistics show that in the 11 year period, 1982-83 to 1993-94, about 66,000 additional teachers were appointed, an increase of about 33.2 per cent over the initial number of 198,871 teachers.[22] This gives an *average annual* growth rate of about 2.65 per cent, and an initial (first year) additional number of 5,250 teachers, or 27,679 teachers in the Seventh Plan. All this does not mean that the actual additional number of teachers during that Plan was 27,679 compared with 10,552 assumed by the FFC. What is done here is to convert the total addition of about 66,000 teachers over a period of 11 years into a series of figures of additional teachers, with the first figure a certain percentage of the initial stock of teachers, and growing at the same fixed annual percentage rate, which will total to 66,000 in 11 years.

3.27 Eighty five per cent of the additional teachers in the first five year period numbering 27,679 is much larger than the initial backlog of

12,890 teachers. As stated in paragraph 3.22, the FFC recommended that in such a case its procedure should be applied to *annual* plans. Calculations were therefore made on a year-by-year basis and an exercise, exactly similar to the one done for Table 2 was carried out with first year resources amounting to 5,250 teachers and an annual growth rate of 2.65 per cent in them. Even then, from the 11th year onwards the *annual* resources for backlog removal exceed the size of total backlog. Under these circumstances, the FFC pooled together schemes in the same sector of development (See Appendix). But that is not possible in this exercise, and perhaps in this sub-sector also. The FFC's formula was therefore continued to be adopted. Its effect is to make the upward changes in the indicator values of the backlog-districts not smoothly but by a kind of a zigzag movement, much up first and a little down next, and so on. The situation is expected to become stable over a long period. Even then it may show a little larger disparity than what would have been obtained by an iterative application of the FFC's procedure (See Appendix) for every *annual* plan. It must be, therefore, clearly stated that this second exercise could not, as it cannot, be done strictly according to the FFC's procedure (because that procedure actually fails after a certain stage). But its results are sufficiently indicative of the types of changes that take place over time among the 25 districts as a group by repeated application of the FFC's procedure. The results are given in Table 2A.

3.28 The state level average indicator goes up from 364.64 (teachers per lakh population) to 389.6 at the end of the 40th year. Later, because the population growth rate starts out-pacing that in the additional resource at that stage, the average starts declining and ends up with a value of 385.6 at the end of the 60th year, reducing the gain in it to about 21 points over its initial value.

3.29 At the end of the 60th year, compared with their initial position, all non-backlog districts end up with having lower indicator values than at the start, except for Amravati, Solapur, Wardha and Nashik. Ratnagiri goes down by 194 points,

Satara by 89, Raigad by 88, Sangli by 61, Kolhapur by 12, Ahmednagar by 11 and Jalgaon by 9 points. Some of them slide down by larger value in the first few decades and then recover ground, but only partially. All backlog districts gain continuously, with minor exceptions, to reach relatively high levels at the end of the 50th year. Beed, initially the second lowest, becomes the second highest in the process, and Satara initially the second highest goes down to the sixth lowest position!

3.30 We should note incidentally that after the end of the 20th year, except for Ratnagiri, disparity seems to have been practically eliminated among all the other districts, a fact which is very important as we shall later see. Also, a comparison of the actual situation in 1992-93 with what it was expected to be, as shown in Column (4) of Table 2A at the end of 10 years, will show whether the GOM in fact allocated the additional resources during this period over the districts in accordance with the FFC's recommendations.

3.31 The standard deviation and the coefficient of variation both decline, the latter from 19.0 per cent to a paltry 1.3 per cent over the 60 year period. Thus, if resources are in fact augmented in future at the same rate at which they were from 1982-83 to 1993-94, the average value of the indicator would rise and disparities could become negligible. But the resources will have to increase at a slightly higher rate from the 41st year if the process of development is to be maintained. Otherwise, the position will deteriorate to the one indicated by Table 2, albeit after a long period of 40 years. Calculations have been done up to the 73rd year which show a decline in the overall state average value to 375.7.

3.32 The more important point to be noted is that the disparity is reduced in great part due to pulling down of Ratnagiri's indicator by nearly 200 points and of indicators of all above-average districts, except Amravati to Nashik, by varying amounts. Even for Amaravati and Solapur the gains are marginal. They are only a shade better for Wardha and Nashik.

TABLE 2A: SIMULATION OF FFC'S PROCEDURE FOR REDUCTION OF DISTRICT LEVEL BACKLOG OF PRIMARY TEACHERS IN MAHARASHTRA
Indicator : Number of Primary Teachers Per Lakh Population

PROCEDURE APPLIED FOR A ONE YEAR PERIOD AT A TIME
ADDITIONAL NUMBER OF TEACHERS: 5,250 IN THE FIRST YEAR, GROWS IN SUCCESSIVE YEARS BY A FACTOR OF 1.0265

			Indicator Values					
				At the End of Year Number				
Sr. No.	District	Initial	10	20	30	40	50	60
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Ratnagiri	592	551	514	480	450	422	398
2.	Satara	472	406	377	381	388	388	383
3.	Raigad	470	398	379	391	383	384	382
4.	Sangli	443	381	379	381	384	387	382
5.	Kolhapur	395	367	379	382	385	387	383
6.	Ahmednagar	393	366	378	381	388	390	382
7.	Jalgaon	393	367	379	392	389	396	384
8.	Amravati	380	368	379	392	385	395	384
9.	Solapur	375	366	378	385	385	394	385
10.	Wardha	367	369	380	389	388	393	390
11.	Nashik	365	365	378	387	389	393	392
12.	Pune	359	364	377	385	382	394	397
13.	Akola	358	367	379	392	387	385	383
14.	Osmanabad	358	365	378	381	395	395	382
15.	Yavatmal	357	368	379	384	388	385	383
16.	Buldhana	346	366	378	396	407	389	385
17.	Dhule	344	366	378	386	387	396	383
18.	Aurangabad	326	363	377	376	380	391	383
19.	Chadrapur	321	366	378	390	383	395	383
20.	Bhandara	320	369	380	387	392	390	391
21.	Nagpur	312	365	378	387	382	388	384
22.	Thane	293	357	374	380	395	375	383
23.	Nanded	286	363	377	382	381	389	392
24.	Beed	280	365	378	388	408	399	381
25.	Parbhani	229	365	378	379	392	389	382
Average		364.6	374.1	381.7	387.0	389.6	389.3	385.6
Std. Deviation		69.2	34.5	22.9	15.7	11.1	8.2	5.0
Coeff. of Var.(%)		19.0	9.2	6.0	4.1	2.8	2.1	1.3
Population (lakhs)		545.39	689.89	877.77	1,124.02	1,449.59	1,884.11	2,469.86
*Growth in Pop. (%)**		...	26.5	27.2	28.1	29.0	30.0	31.1
Backlog		12,890	5,481	3,391	3,800	4,749	5,378	4,928
Total Number of Teachers		198,867	258,088	335,026	434,959	564,779	733,403	952,441
*Growth in Teachers (%)**		...	29.8	29.8	29.8	29.9	29.9	29.9

* Growth during the past decade

3.33 It may be for a few years that the advanced districts may be held back, even pushed back to some extent for some short period, so that the below-average districts can catch up with them and then all of them will develop together without much difference. But it appears that, even with the more realistic assumption about the size of additional resources and their continued growth based on the experience of the eleven year period 1982-83 to 1993-94, the reduction in disparity will be achieved with a great set-back to the above-average districts. And what does it achieve? Only a very small overall development - hardly of 2 teachers per three years per lakh of

population, and a marginal gain for the below-average districts, the highest gain being of 2.56 teachers per lakh of population per year for the most initially disadvantaged district of Parbhani. And all this over a period of 60 years!

3.34 It is unreasonable to think that the FFC imagined this drastic deterioration in the situation of the above average districts when it said that its approach 'implies a certain acceleration of the pace of development in the districts lagging behind and to that extent a certain slowing down of the pace of development in the districts which are already ahead' [FFC, 1984, Para 3.35], or that '(t)he conclusion is inescapable. If the backlog of the districts lagging behind is to be removed or reduced, it may not be possible to maintain the present level of some of the services reached in some of the advanced districts' [FFC, 1984, Para 17.23]. These are understatements of the highest order to describe what will happen if its approach is followed, at least in this particular sub-sector.

3.35 All this is far from a realistic solution to the problem and was not surely expected. Why does this happen? Because the question of size of resources was kept separate from the solution to the problem of reducing disparities and, in this case, the factor of population growth remained to be adequately accounted for both in the total resources devoted to the sub-sector and in the FFC's provision for 'natural growth'. A completely fresh approach to the solution is needed which the next section attempts to develop.

SECTION IV

RECONSIDERATION OF THE PROBLEM

Alternative to FFC's Approach

4.1   It should be clear from the preceding section that the solution for elimination of disparity cannot be separated from the consideration of size of additional resources in real terms and, in the particular case, we are considering, of population growth, and the consequent effect on the condition of the relatively advanced districts. For a process which results in the better-off districts receiving a severe set-back in order to achieve the objective of elimination of disparities, howsoever desirable that objective may be, cannot be reasonably considered a solution to the problem of

disparities and as politically feasible. The FFC worked under the constraint of given resources and did not fully take into account the implications of population growth; that resulted in the scenario reflected by Tables 2 and 2A. Therefore, to be realistic, the resolution of the question of disparities must take into account:

A) For a given definition of a region,

where population is a relevant factor,
     i) the growth in population;
     ii) prevention of deterioration of conditions of better-off districts;

and in all cases,
     iii) the resources needed, consistent with a given time-frame to eliminate disparities, or vice versa;

and

B) the very question of the definition of region itself.

The last point arises because the FFC went on to recommend that the unit of analysis and, therefore, of action by government, should be lower than the district in certain cases.

4.2   The exercise to assess realistically how the first three aspects of the problem are inter-related is carried out, using the same illustrative case of primary teachers, with the following assumptions;

  i) For no district the value of the indicator would decrease over the years;
  ii) the district with the maximum value of the indicator has its indicator value pegged down to that initial level, and continues to have the maximum value till all districts catch up with it;
  iii) the indicator values of all other districts continuously increase but never exceed the initial maximum value;
  iv) the annual growth rate of population of every district equals its average annual growth rate as experienced over the period 1981-91.

The first three conditions mean that deterioration in the condition of any district is avoided, and only the district with the maximum indicator value is held fixed at its initial level of development.

4.3 The exercise was done to work out two types of result: *one*, the number of years in which disparity will be eliminated for a given size of resource, and *two*, the amount of resources needed to eliminate disparity in a given number of years. The basis of the exercise is explained in the first Mathematical Note. But it really is very simple compound interest arithmetic as explained below.

4.4 If disparity is eliminated, all districts' indicators will be equal to 592.43, that of Ratnagiri, the highest indicator value. At this stage, the total number of primary teachers will be (545.39x592.43 =) 323,105. Since the initial number of teachers was 198,867 it means that the total number of teachers has to increase to 1.6247 times the initial value. Note that the ratio of maximum to average indicator is identically the same, that is 1.6247.

4.5 Now, if this happens in *n* years, and *g* is the annual growth rate by which the number of teachers is increased over these years, then the *n* and *g* are related by the compound interest formula:

$$(1 + g)^n = 1.6247 \quad \dots\dots\dots\dots(1)$$

But there is something more. The population will also increase during this period. Suppose the population of every district grows at the same annual rate of *r* per year, then the quantity on the right hand side of the formula will increase by a factor by which the population will grow in *n* years, that is by $(1 + r)^n$, and the formula becomes

$$(1 + g)^n = 1.6247 \times (1 + r)^n \quad \dots\dots\dots(2)$$

Given the value of *r*, the population growth rate, one can find from this formula the value of *n* given the value of *g* or *vice versa*. The only point is that *the growth rate of population is not the same for all districts* which makes the calculation cumbersome. The first Mathematical Note explains how it was done.

4.6 It will be useful to dwell upon these two simple equations before proceeding with the

discussion of the results of the exercise. The *first* equation applies to all sub-sectors where growth of population is *not relevant*. The equation can be written in the general form:

$$(1 + g)^n = \text{Ratio of Maximum to Average (indicator value)}$$

The larger the ratio of the maximum to the average, that is, the greater the disparity, the longer it will take to eliminate disparity for a given growth rate of real resources (in relation to the initial stock), or for a given time-frame (that is the value of *n*), the larger should be the growth rate of these resources.

4.7 From the second equation, it is obvious that the growth rate *g* in resources must be larger than the population growth rate *r* if disparity is to be eliminated. Otherwise it will be impossible to eliminate disparity under the first three conditions set down in paragraph 4.2 of the formulation of our problem.

4.8 In both cases, the equations can be extended to the situation when it is desired that not only should disparity be eliminated but also that all districts should attain a certain normative level of indicator value which is higher than the maximum. In this case the only change is to use the ratio of this normative value to the average on the right hand side of the equations. Conversely, if the goal of disparity elimination is moderated by requiring that all districts below the top-most reach a level of the second highest district, that is less than the maximum, the ratio of this lower value to the average is to be used in the first equation. In the second equation, the same principle is to be followed with a slight modification to allow for the resource requirement on account of the population growth of the top-most district.

4.9 As soon as districtwise values of the indicator, appropriate for measuring development in a particular sector are worked out, the two simple equations make it very easy to gauge the magnitude of the requirement of the resource growth rate for a given time-frame, or of the resulting time-frame for a given resource growth rate, to eliminate disparity in that sector. Where the indicator is firmly related to population, it is not necessary for this assessment to do districtwise

calculations for growth in population, but the use of the average population growth rate on the right hand side of the second equation will give a good enough approximation to the value of n or g.

Period Required for Elimination of Disparity

4.10 The first type of results of this exercise giving the number of years required to eliminate disparity for a given size of resource are shown in Table 3. It considers additional resources in two stages; the amount (number) in the first year shown in its Column (1), and the annual growth rate, given in the headings of Columns (2) to (10), at which that number increases in successive years. The number of years that it will take to eliminate disparities is shown in the body of the table.

4.11 As stated before, the FFC assumed that 10,552 additional teachers will be appointed during the VII Five Year Plan. This is 5.306 per cent of the initial stock of 198,867 teachers and gives an annual growth rate of 1.0394 per cent yielding 2,067 teachers in the first year. That is why the table, in its Column (1), starts with the figure of 2,000 teachers in the first year. At this

level of additional resources in the first year and an annual growth rate of *two* per cent, the table shows that it is impossible to eliminate disparity, not at least in 100 years. With a smaller growth rate of 1.0394 per cent, it is clearly impossible to do the same. But, as worked out in paragraph 3.26, the actual number of additional teachers appointed was much larger and equivalent to about 5,250 in the first year growing at an annual rate of 2.65 per cent; even then, as the table shows, the situation does not change and removal of disparity remains a distant, or an impossible, goal. One should note that what has been worked out is not exactly comparable with the FFC's formulation of the solution in which the indicator values of the above average districts were allowed to decline drastically.

4.12 The decadal growth in the total population of the 25 districts shown in Table 2, means that the average annual growth rate of total population will increase from 2.38 per cent to 2.74 per cent for the six decades. Table 3 clearly shows that if the growth rate in the resources is less than the population growth rate, it is impossible to eliminate disparity completely.

TABLE 3. NUMBER OF YEARS REQUIRED TO ELIMINATE DISTRICT LEVEL DISPARITY IN PRIMARY TEACHERS IN MAHARASHTRA ACCORDING TO SIZE OF ADDITIONAL RESOURCE IN THE FIRST YEAR AND ITS ANNUAL GROWTH RATE

Additional Teachers in the First Year	Number of Years if Additional Number of Teachers Grows at an Annual Rate of								
	2%	3%	4%	5%	6%	7%	8%	9%	10%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2,000	NP	NP	NP	92	67	54	46	40	36
3,000	NP	NP	NP	70	52	43	37	33	30
4,000	NP	NP	90	55	43	36	31	28	25
5,000	NP	NP	66	44	35	30	27	24	22
6,000	NP	NP	51	37	30	26	23	21	20
7,000	NP	NP	40	31	26	23	21	19	18
8,000	NP	53	32	26	23	20	18	17	16
9,000	NP	38	27	23	20	18	17	15	14
10,000	NP	29	23	20	18	16	15	14	13

NP = Not possible at all, or 100 years or more.

4.13 Table 3 provides a sort of a ready reckoner, for the example we are considering, to work out the number of years that will be required to eliminate disparity completely for a given size of additional resources in the first year and its annual growth rate. It can also be used to work out roughly the size of initial additional resource and

its growth rate for elimination of disparity in a given number of years.

Resources for Disparity Elimination

4.14 Table 3A exhibits the obverse side of the question. It tells us the total amount of resources

that will be needed to eliminate disparity in a given number of years. It is an easier and a more straight forward calculation using equation (11) of the first Mathematical Note. Its explanation is simple.

4.15 If we wish to eliminate disparity *instantly* the indicator values of all districts should equal 592.43. In this situation the total number of teachers will be equal to total population multiplied by this value of the indicator, that is

$$545.39 \times 592.43 = 323,105 \text{ teachers}$$

Initially we have in total 198,867 teachers. Thus the additional number of teachers will have to be $(323,105 - 198,867 =) 124,238$, the difference of this from 124,240 shown in the table being due to rounding of numbers. *We shall call this number total initial disparity.* This explains the first line of numbers in Table 3A. Since disparity removal is instantaneous, all additional resources are spent on removal of disparity and nothing needs to be spent on account of growth in population.

TABLE 3A. ADDITIONAL RESOURCES REQUIRED FOR ELIMINATION OF DISTRICT LEVEL DISPARITY
IN PRIMARY TEACHERS IN MAHARASHTRA IN A GIVEN NUMBER OF YEARS

INITIAL STOCK OF PRIMARY TEACHERS = 198,867

No. of Years	Total Additional Teachers for			Col.(3) as per cent of Col.(4) (%)	Annual Growth Rate(%) in Stock	First Year Resource
	Population Growth	Disparity Removal	Total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0	0	124,240	124,240	100.00	-	-
5	23,731	140,544	164,275	85.55	12.80	25,452
10	50,623	159,218	209,841	75.88	7.47	14,854
15	81,151	180,644	261,795	69.00	5.76	11,455
20	115,870	205,277	321,147	63.92	4.92	9,791
25	155,432	233,659	389,091	60.05	4.43	8,812
30	200,602	266,432	467,033	57.05	4.11	8,175

Note: See text for explanation of Col.(6) and Col.(7).

4.16 Suppose the target is 10 years in which disparity is to be completely eliminated. From Table 2 we know that the total population at the end of 10 years will be 689.88 lakhs. Since disparity will be removed at that point of time, the total number of teachers at the end of 10 years will have to be

$$689.88 \times 592.43 = 408,706$$

which is an increase of 209,839 over the initial number (198,867) of teachers. This figure with minor difference is shown in Column (4) in the line for 10 years. Its components: the additional number of teachers required due to population growth (to maintain indicator values at the initial levels), and those for elimination of disparity, are shown in Columns (2) and (3). (See the equation (11) of the first Mathematical Note for their basis.) The percentage that the latter component, that is, resources for disparity removal, forms of

the total additional resources, is shown in Column (5).

4.17 This percentage goes on declining as the targeted period in which disparity is to be eliminated increases. It is what one should expect, because as the period becomes longer, larger resources are required to absorb the effect of population growth. The table thus points to an otherwise obvious but an important conclusion that the part of resources that should be allocated for 'natural growth' cannot be a fixed proportion but will depend upon the period in which one plans to eliminate disparity which, in turn, depends upon the size of additional resources one is capable of spending. Contrast this against the FFC's recommendation that a fixed proportion of 15 per cent of additional resources should be earmarked for natural growth. Note from this table that, for the particular indicator under discussion, this recommended proportion is consistent only if disparity were to be eliminated in a

short span of *five* years.

4.18 Column (6) expresses the implied annual growth rate in the present stock of teachers (198,867) if resources equal to those shown in Column (4) are to be additionally created in the number of years shown in Column (1). As we saw above, if the targeted period is 10 years, the total number of teachers at the end of that period should be 408,706, and this means that the initial number of 198,867 teachers should grow at an annual rate of 7.469 per cent per year, the figure shown in Column (6). With this rate, the number of additional teachers in the first year will have to be 14,854 the figure shown in Column (7).

4.19 All this means is that to eliminate disparity in exactly 10 years, we should appoint 14,854 teachers in the first year and that number should grow at an annual rate of 7.47 per cent. Further, nearly 24 per cent of the additional number should be allocated for 'natural growth'. As we saw before, the actual experience was equivalent to 5,250 additional teachers in the first year growing at an annual rate of 2.65 per cent per year. This pair of figures is nowhere to be found in Columns (7) and (6) of the table. Thus, at this rate there is no chance that disparity will be eliminated in 30 years, in fact, not even in 100 years as Table 3 showed.

4.20 Column (6) also has another meaning, which needs to be explicitly stated. *It gives the target for the growth rate to be achieved in the sector for the duration of the period if disparity is to be eliminated by the end of that period. It thus links the attainment of the objective of removal of disparity with the growth that must take place in the sector. The two cannot be separated.*

4.21 It is to be emphasised that both the tables have been prepared assuming that a certain additional number of teachers is appointed in the first year, and that that number grows at a certain uniform annual growth rate from year to year over the years. This type of growth model is consistent with how growth and resources are planned. But it is not suggested that that is how the actual planning should exactly take place. What is important is to achieve the same total additional number of teachers by the end of the last of the number of years shown. For example, from Table

3A, we must have 209,841 *additional* primary teachers at the end of 10 years to eliminate disparity during that period with their proper distribution. The yearwise numbers may vary, but they have to add to 209,841 over 10 years.

4.22 If we speak in round numbers, we had initially about two lakh primary teachers in all districts together. That number has to be increased by 82 per cent if we wish to eliminate disparity in five years, by 100 per cent if we wish to do so in 10 years and by 160 per cent if we are to do that in 20 years. And even in doing this, one should not forget that in this exercise we have pegged down the maximum indicator value to its initial level. *It is just the maximum among a group of values; it is not as if that value satisfies educationists' norm.* One cannot, in fairness, continue to peg down the corresponding district to that indicator value for a long time.

4.23 The fact of the inter-relationships among the four elements: the size of initial disparity among districts, the rate of population growth, the number of years to eliminate disparity, and the resources necessary to achieve the objective, did not require to be discovered. What was done above, was to clearly quantify these relationships. By doing this the table sharply focuses on the relationship between the last two given the reality of the first two. If, as it has actually happened, our capacity for growth in this sector is limited to increasing the number of teachers by about 60,000 in ten years, we should know from these tables how far distant away in time the elimination of disparity will take place, if at all, or how inadequate our resources are compared with what is required. For, the figure in Column (2) against 10 years shows that about 51,000 teachers of these 60,000 teachers will be needed only on account of population growth leaving little for removal of disparity. This dismal reality is a logical, an arithmetically inexorable, consequence of population growth, application of inadequate resources, and the insistence on absolute equality.

Two Situational Variants

4.24 The large requirement of resources needed to eliminate disparity within a reasonable time-frame forces us to study two important aspects of

the situation. One is the effect of moderation of the goal of complete elimination of disparity, and the other of the expectation that the population policy may very well succeed resulting in a

declining population growth rate. The effect of these two possibilities separately and in combination are worked out and discussed below.

TABLE 4. NUMBER OF YEARS REQUIRED TO ELIMINATE DISTRICT LEVEL DISPARITY IN PRIMARY TEACHERS IN MAHARASHTRA ACCORDING TO SIZE OF ADDITIONAL RESOURCES IN THE FIRST YEAR AND ITS GROWTH RATE

Additional Teachers in the First Year	Population Growth Model	Maximum Value	Number of Years if Additional Number of Teachers Grows at an Annual Rate of								
			2%	3%	4%	5%	6%	7%	8%	9%	10%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
5,000	Same	592.43	NP	NP	66	44	35	30	27	24	22
	"	472.46	NP	NP	43	31	25	22	20	18	17
	Declining	592.43	72	52	42	36	31	28	25	23	21
	"	472.46	52	39	31	26	23	21	19	17	16
6,000	Same	592.43	NP	NP	51	37	30	26	23	.21	20
	"	472.46	NP	58	30	24	20	18	16	15	14
	Declining	592.43	59	45	36	31	27	24	22	20	19
	"	472.46	41	31	25	21	19	17	16	15	14
7,000	Same	592.43	NP	NP	40	31	26	23	21	19	18
	"	472.46	NP	31	23	19	17	15	14	13	12
	Declining	592.43	50	38	31	27	24	22	20	18	17
	"	472.46	31	24	20	18	16	15	14	13	12
8,000	Same	592.43	NP	53	32	26	23	20	18	17	16
	"	472.46	NP	21	18	15	14	13	12	11	11
	Declining	592.43	43	33	27	24	21	19	18	17	16
	"	472.46	23	19	17	15	14	13	12	11	11
9,000	Same	592.43	NP	38	27	23	20	18	17	15	14
	"	472.46	21	16	14	13	12	11	10	10	9
	Declining	592.43	36	28	24	21	19	17	16	15	14
	"	472.46	18	15	14	13	12	11	10	10	10
10,000	Same	592.43	NP	29	23	20	18	16	15	14	13
	"	472.46	15	13	12	11	10	10	9	9	9
	Declining	592.43	30	25	21	19	17	16	15	14	13
	"	472.46	14	13	12	11	10	10	9	9	9

Notes: 1. NP = Not possible at all or 100 years or more.
2. Population Growth Models.
Same = The average annual 1981-91 growth rate assumed to continue in future for every district separately. Declining = See text.
3. Maximum value = 1) the highest, and 2) the second highest, indicator value.

Reconsidering Absolute Equality

4.25 We saw that for eliminating disparity completely (and instantaneously) we need 124,240 additional teachers. But suppose we moderate the goal of complete equality to 'near complete' equality and attempt to remove dis-

parity among all districts, except Ratnagiri which has the highest indicator value. This would mean that the indicator values of all districts equal the second highest value: 472.46 of Satara. What will this imply in terms of saving in the additional resources?

TABLE 4A: ADDITIONAL RESOURCES REQUIRED FOR ELIMINATION OF DISTRICT LEVEL DISPARITY IN PRIMARY TEACHERS IN MAHARASHTRA IN A GIVEN NUMBER OF YEARS

INITIAL STOCK OF PRIMARY TEACHERS = 198,867

No. of Years	Population Growth Model	Maximum Value	Total Additional Teachers for			Col.(5) as per cent of Col.(6) (%)	Annual Growth Rate(%) in Stock	First Year Resource
			Population Growth	Disparity Removal	Total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	Same	592.43	0	124,240	124,240	100.00	-	-
	"	472.46	0	61,342	61,342	100.00	-	-
	Declining	592.43	0	124,240	124,240	100.00	-	-
	"	472.46	0	61,342	61,342	100.00	-	-
5	Same	592.43	23,731	140,544	164,275	85.55	12.80	25,452
	"	472.46	23,731	69,666	93,396	74.59	8.00	15,919
	Declining	592.43	24,511	141,119	165,630	85.20	12.88	25,619
	"	472.46	24,511	69,966	94,477	74.06	8.08	16,077
10	Same	592.43	50,623	159,218	209,841	75.88	7.47	14,854
	"	472.46	50,623	79,246	129,869	61.02	5.15	10,251
	Declining	592.43	50,623	159,218	209,840	75.88	7.47	14,854
	"	472.46	50,623	79,246	129,869	61.02	5.15	10,251
15	Same	592.43	81,151	180,644	261,795	69.00	5.76	11,455
	"	472.46	81,151	90,291	171,442	52.67	4.23	8,416
	Declining	592.43	78,107	178,361	256,467	69.55	5.68	11,292
	"	472.46	78,107	89,087	167,194	53.28	4.15	8,256
20	Same	592.43	115,870	205,277	321,147	63.92	4.92	9,791
	"	472.46	115,870	103,053	218,923	47.07	3.78	7,520
	Declining	592.43	106,658	198,311	304,969	65.03	4.76	9,462
	"	472.46	106,657	99,363	206,021	48.23	3.62	7,197
25	Same	592.43	155,432	233,659	389,091	60.05	4.43	8,812
	"	472.46	155,432	117,831	273,263	43.12	3.52	6,998
	Declining	592.43	135,895	218,767	354,662	61.68	4.18	8,312
	"	472.46	135,895	109,911	245,806	44.71	3.27	6,505
30	Same	592.43	200,602	266,432	467,033	57.05	4.11	8,175
	"	472.46	200,602	134,983	335,584	40.22	3.35	6,563
	Declining	592.43	165,369	239,370	404,739	59.14	3.77	7,498
	"	472.46	165,369	120,536	285,905	42.16	3.01	5,995

Notes: for population growth model and maximum value, the same as for Table 4

4.26 The population of all districts excluding Ratnagiri is (545.39 - 21.11 =) 524.28 lakh; and the total number of teachers in them is (198,867 - 12,506 =) 186,361. Now, if the indicator values of these 24 districts is to become equal to the second highest value of 472.46, their total number of teachers has to be (472.46x524.28 =) 247,701 which means an increase of (247,701 - 186,361 =) 61,340 which is just about half of 124,240.

Thus, the disparity among 24 of the 25 districts can be removed with just half the amount of resources that are needed to eliminate disparity completely. It is the last step, from Satara to Ratnagiri, that is the most expensive costing 50 per cent of the total resources. Is it worth this huge cost, the realisation of the objective of absolute equality ? Or, can one be realistic and settle for a little less than ideal, but at a great saving in terms

of cost or the quickness with which the lowered objective can be achieved?

4.27 Note from Table 2A that we would have reached a similar position following the FFC's procedure after 20 years, with little difference among all districts excluding Ratnagiri. But that situation is vastly different from the one we are discussing now; the indicator values of eight of the 11 above-average districts are reduced in that situation which does not happen in the exercise made above. All indicator values, except for Satara and Ratnagiri, increase and for these two districts they do not decline but remain the same.

4.28 Recall that there are limitations, mentioned in paragraph 3.3, about the exact comparability of the indicator values of different districts. Also, it may be an historical accident that a particular district has a very high indicator value. It could therefore make practical sense to think about, not total elimination but, almost total elimination of disparity, with the latter term specifically meaning in this case that all districts are brought up to the level of the second highest district of Satara. If such a reformulation of the objective makes a large difference, it would be worth while considering it. With this reformulation, the number of years in which disparity is almost totally eliminated (for a given size of initial resource and its growth) and the resources needed to achieve this goal if the number of years is given, are calculated and shown, in Tables 4 and 4A, respectively, by exactly the same procedures as for Tables 3 and 3A.

4.29 Like Table 3, Table 4 shows the number of years required to eliminate disparity as also to nearly eliminate it, given the amount of resources in the first year and their growth rate. For every size of resource and growth rate there are four lines of figures the *first two of which are relevant at this stage*, as they assume the continuation in future of the same average annual growth rate of population of every district as was observed for it in 1981-1991. The first line copies data from Table 3 for comparison. The second line corresponds with the objective of *almost* total elimination of disparity between districts, that is when the indicator values of all districts below Satara are raised to that of Satara (472.46). The table does not include all values of resources shown in Table 3 but starts with 5,000 as that is what is close to what actually took place.

4.30 Table 4 shows that the lowered goal will be

reached in about 50 to 60 per cent of years that would be otherwise taken to reach the original goal of total elimination of disparity. This is consistent with what we observed in the preceding analysis of disparity that to reach almost equality we need 50 per cent of the resources that will be needed for reaching total equality. The percentage *reduction* in the period is related to the size of resource and its growth rate. At lower growth rates or higher levels of initial resource, the percentage reduction is larger. When total equality could be attained in a period of about 30 years, with the same initial resources and the growth rate, the reduced goal can be achieved in just 13 to 20 years, depending upon the size of initial resources and their growth rate.

4.31 The same picture, viewed from another angle, is presented in Table 4A, which like Table 3A shows total resources needed to eliminate disparity in a given number of years. For every choice of number of years, there are four lines of figures, and as in Table 4, the first two are relevant at this stage with the first line copied from Table 3A. The second line shows the results for the same reduced goal.

4.32 The Column (6) of this Table is of prime importance. A comparison of figures in the first two lines in it for the periods of 20, 25, and 30 years shows that to achieve the reduced goal of near equality in the same number of years we need only 70 per cent of resources that would be needed for achieving total equality. If the length of the period is less that this, we need even much less percentage of resources, about 60 per cent if the period be 5 to 10 years, and 65 per cent if it be 15 years. Note from Column (4) that in both the alternatives of goals, for the same number of years, the resources required for population growth are the same, as they should be, but those required for elimination of disparity, shown in Column (5), are nearly halved when the goal is moderated. All this translates itself into a smaller initial investment of resources and its reduced annual growth rate (Columns (8) and (9) of the table).

4.33 Admittedly, the considerable shortening of the waiting period, or the large decrease in resource requirement for a given period, that results from the moderation of goal from total to

almost total equality in this particular case is in a considerable part due to the large difference in the indicator values of the highest and the second highest indicator values. But, with less dramatic effect perhaps in other cases too, the same type of results will always hold good because of the increasing marginal costs of raising indicator values at the higher end of the scale (See Appendix). The purpose of this exercise was to highlight the possibly large gains that might accrue by a small, and reasonably realistic, compromise on complete equality and to prompt examination of the possibility of a such a compromise in every sector depending upon its circumstance.

Hopeful Decline in Population Growth Rate

4.34 It was seen from Table 3A that a significant proportion of additional resources needed for elimination of disparity was accounted for by population growth and that the proportion expectedly increases with the number of years given for elimination of disparity, reaching 43 per cent when the waiting period will be 30 years. That exercise assumed that for every district the growth rate of its population would continue to be the same as was observed for it from 1981 to 1991. This continuation of growth rate is, in part, the cause of the less than inspiring prospects for elimination of disparity in the near future or for the very large amount of resources that may be needed to achieve that objective in a reasonable period of time. It may be argued that the assumption about the population growth may not actually hold in reality; for example the population of Thane district, a backlog district, which grew by nearly 57 per cent from 1981 to 1991, may not grow at the same rate in future. One may reasonably expect that with the successful implementation of the population policy the population growth rate may, in fact, decline. In turn, it could be reasonably hoped, the prospects of elimination of disparity may not be as bleak as the calculations so far made make them out to be.
4.35 The exercises underlying Tables 4 and 4A were, therefore, repeated to assess the effect of a declining population growth rate for almost all districts. It was assumed in this variation that,

starting from 1981, the annual growth rate in population of every district will continuously decline (exponentially) over a period of 50 years till it reaches *one* per cent per year and will then maintain itself at that level. The only exception was Ratnagiri where the average annual growth rate of population observed from 1981 to 1991 was less than one per cent; for it, the same growth rate was assumed to continue in future. The mathematical model ensured that, in every district, the growth in population between 1981 and 1991 implied by the model will equal that actually observed between those two years. The details of how the population of every district was worked out for future years are given in the second Mathematical Note. The results of the exercises are given in the third and fourth lines of every set of four lines in Tables 4 and 4A, with the third line for complete elimination of disparity and the fourth for near complete elimination of disparity, both under the conditions of a declining population growth rate.
4.36 In Table 4, a comparison of results in *line 3* for every size of resource and its growth rate, with the corresponding results in *line 1*, will show that the effect of reduction in population growth rate in future on the number of years required for elimination of disparity is larger, the more distant the future is in which elimination of disparity will be achieved. This is as one would expect. Thus, for the (5,000,4%) combination of initial resource and its growth rate, the number of years (in which disparity is eliminated) steeply comes down from 66 to 42. Also, what would have taken 100 year or more, or what was impossible to achieve (2 or 3% resource growth rate) now becomes possible or takes much smaller number of years. But that is little consolation because it only means a change from a very distant future to a fairly distant future, except when initial resource allocation is very large to begin with.
4.37 If we look for the comparative picture when it takes only about 30 years to completely eliminate disparity, the reduction in number of years is only marginal, about 10 per cent. And as the former number of years becomes 20, it is just about one or two years.
4.38 Comparison of *line 4* with *line 2* results shows the effect of declining population growth

rate on number of years in which near equality will be achieved. The comparison shows a slightly smaller effect of declining population growth rate, simply because the lowered goal itself takes fewer years to achieve.

4.39 The conclusion emerges that although the *growth* in population is a factor that must be reckoned with, the change in the *growth rate* has only a marginal effect in most practical situations when the goal is to be achieved in about 20 to 30 years time. The assumption of constant growth rate, the average annual growth rate as was observed from 1981 to 1991, in the case of every district was not a significant factor in making the prospects of achieving equality look bleak.

4.40 This is also reflected by results given in Table 4A in its Column (6). For every targeted number of years, a comparison of line 3 with line 1, or line 4 with line 2, shows that *reduction* in resources required increases from only 2 per cent for a 15-year target to 13 per cent for the 30-year target. The reduction is only slightly higher if the goal is scaled down to reaching near equality.

4.41 The simple explanation for these results is that the decline in population growth rate is a long-term process of change. Its effect in reduction in number of years in which disparity is eliminated or almost eliminated becomes significant only when that number of years is large, that is when the goal was distant enough to begin with. This is also similarly true of its effect on the size of resources.

4.42 The period of 50 years for the population growth rate to decline to one per cent, and the limit of one per cent itself, are both arbitrary, although reasonably chosen magnitudes to study the effect of a declining trend in population growth rate. It is possible that the decline may take place sharply, in a much shorter period, in which case it will make a significant impact to brighten the prospects for elimination of disparity. But that only strengthens the conclusion that in sectors where indicators are firmly rooted in the size of population, the issues of elimination of regional disparities and of control of population growth are closely intertwined.

4.43 The exercise, therefore, does not detract from the importance of population *growth*, which is different from the question of *change in the*

growth rate, as a factor inextricably involved with the issue of removal of regional disparities. For, as Column (7) of Table 4A shows, a large proportion of additional resources is accounted for by population growth. The longer it will take to remove disparity the larger will be the proportion of additional resources required due to population growth. And the period depends upon the goal: complete or near complete elimination of disparity. In this particular case, the difference between the two is very large forcing one to exercise a choice in favour of the second goal which is achievable more quickly for given resources, or with much less resources in a given time, irrespective of the success of a population policy.

Unit for Reckoning Disparities

4.44 As stated earlier, the FFC recommended that in certain sectors, the unit for comparison and reckoning of disparities be lowered from district to a taluka. It should be obvious that as one sub-divides people into smaller groups for comparison among them, the phenomenon of disparity will stand out with greater sharpness, the magnitude of disparity will be magnified and so will the necessary resources needed to bring about equality among the (smaller) groups or the period that will be taken to eliminate disparity. We saw above that if the number of primary teachers was to grow at the same rate at which it grew over the period of eleven years: 1982-83 to 1993-94, the objective of eliminating disparity at the district level was almost an impossible goal to achieve. Even if the number is increased by 50 per cent, with the growth rate remaining the same, it would take more than 50 years to achieve the goal. (See Table 3, line for 8,000 teachers and growth rate of 3 per cent.) If, using the same amount of resources, we were to reckon and attempt to eliminate disparity at the lower level of taluka, the realisation of the goal of equality will be pushed further away in time, making the prospects of removal of disparity more dismal than before. If that is not to happen, we will need much larger resources than what were actually available.

4.45 To work out the severity by which the problem is exacerbated by reckoning units

smaller than a district, one needs the necessary data at the level of a taluka. But those data are not available. I have therefore worked out the results by moving upwards, that is by taking the historically recognised Regions as units to indicate in a reverse manner the effect of lowering of the unit on resources or on the period of achieving equality. The exercise also has a real practical

significance in the light of the decision the Government of Maharashtra took in 1969 to recognise districts, and not Regions, as units for planning and reduction of disparities.

4.46 By pooling the data shown in Table 1, Table 5 shows them for the three Regions of Maharashtra.

TABLE 5: REGIONWISE VALUES OF POPULATION, ITS GROWTH RATE AND INDICATOR
FOR MAHARASHTRA

Indicator: Number of Primary Teachers Per Lakh Population

Sr. No.	Region	Population		Value of Indicator
		(in lakh) (1981)	Average Annual Growth Rate 1981-1991 (%)	
(1)	(2)	(3)	(4)	(5)
1.	The Rest of Maharashtra	304.68	2.456	395.92
2.	Vidarbha	143.43	1.950	341.47
3.	Marathwada	97.29	2.760	300.81
Total/Average		545.39	2.379	364.64

Note: The Rest of Maharashtra includes Konkan Region but excludes Greater Bombay.

TABLE 6. NUMBER OF YEARS REQUIRED TO ELIMINATE REGION LEVEL DISPARITY IN PRIMARY TEACHERS IN MAHARASHTRA ACCORDING TO SIZE OF ADDITIONAL RESOURCES IN THE FIRST YEAR AND ITS GROWTH RATE

Additional Teachers in the First Year	Population Growth Model	Maximum Value	Number of Years if Additional Number of Teachers Grows at an Annual Rate of								
			2%	3%	4%	5%	6%	7%	8%	9%	10%
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
5,000	Same	395.92	NP	31	20	16	13	12	11	10	10
	Declining	"	30	21	17	15	13	12	11	10	10
6,000	Same	395.92	23	14	11	10	9	9	8	8	7
	Declining	"	16	13	11	10	9	9	8	8	7
7,000	Same	395.92	9	8	8	7	7	6	6	6	6
	Declining	"	10	9	8	7	7	7	6	6	6
8,000	Same	395.92	6	6	6	5	5	5	5	5	5
	Declining	"	7	6	6	6	5	5	5	5	5
9,000	Same	395.92	5	5	5	4	4	4	4	4	4
	Declining	"	5	5	5	5	4	4	4	4	4
10,000	Same	395.92	4	4	4	4	4	4	4	4	3
	Declining	"	4	4	4	4	4	4	4	4	4

Notes: 1. NP = Not possible at all or 100 years or more.
2. Population growth models same as in Table 4 at the level of Regions.

The Regions are arranged in the descending order of the values of the indicator under consideration: The Rest of Maharashtra, Vidarbha and Marathwada. Using the same assumptions as were made for working out the pairs of Tables 3 and 3A, and 4 and 4A, Tables 6 and 6A are prepared to show the number of years required to eliminate disparity among Regions for given resources, and the resources needed to do so in a given number of years, respectively. Results in both the tables have been worked out under the two assumptions about population growth rate. An important point to note is that the assumptions now apply to the total population of a Region, that is to say, in the first case, the Region's population is expected to grow in future at the same rate at which it did on average during the period 1981-91 and, in the second case, the rate of growth of a Region's population will decline in a period of 50 years after 1981 to one per cent per annum and remain at that level later. This is not strictly the same as when the same assumptions are made at the district level.[23] The alternative of near equality, in the sense we have considered at the district level, has no meaning here as we are considering only three Regions.

4.47 Compare now the first line in Table 6 for every quantum of initial resource with the corresponding line of Table 4 and observe the vast change in the scenario. With 5,000 additional teachers growing at 3 per cent per year, what was impossible or would have taken 100 or more years to achieve, when the district was the unit, becomes attainable in 31 years with Region as a unit. With the same initial resources but a growth rate of 4 per cent per year, what would have taken 66 years to attain takes now only 20 years; and so on. *Compare any set of corresponding figures and notice that, with the same initial resource allocation and its growth rate, the goal of achieving Regional equality is achievable in one-third to one-half the number of years that it would take to achieve district level equality!* Since the number of years required to remove Region level disparity is small, the assumption about declining population growth rate has little effect, unless the number of years is larger than 20.

TABLE 6A: ADDITIONAL RESOURCES REQUIRED FOR ELIMINATION OF REGION LEVEL DISPARITY IN PRIMARY TEACHERS IN MAHARASHTRA IN A GIVEN NUMBER OF YEARS

INITIAL STOCK OF PRIMARY TEACHERS = 198,867

No. of Years	Population Growth Model	Maximum Value	Total Additional Teachers for			Col.(5) as Per cent of Col.(6) (%)	Annual Growth Rate in Stock (%)	First Year Resource
			Population Growth	Disparity Removal	Total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	Same	395.92	-	17,060	17,060	100.00		
	Declining	395.92		17,060	17,060	100.00		
5	Same	395.92	24,792	19,204	43,996	43.65	4.08	8,110
	Declining	395.92	25,627	19,277	44,904	42.93	4.16	8,265
10	Same	395.92	52,716	21,622	74,339	29.09	3.23	6,417
	Declining	395.92	52,716	21,622	74,339	29.09	3.23	6,417
15	Same	395.92	84,174	24,354	108,529	22.44	2.95	5,858
	Declining	395.92	81,013	24,077	105,090	22.91	2.87	5,705
20	Same	395.92	119,618	27,442	147,060	18.66	2.81	5,581
	Declining	395.92	110,201	26,614	136,815	19.45	2.65	5,274
25	Same	395.92	159,558	30,933	190,491	16.24	2.72	5,417
	Declining	395.92	139,908	29,198	169,107	17.27	2.49	4,956
30	Same	395.92	204,571	34,882	239,453	14.57	2.67	5,308
	Declining	395.92	169,712	31,793	201,505	15.78	2.36	4,693

Note: Population growth models same as in Table 6.

4.48 The other side of the comparative picture will be provided by a comparison of Table 6A with Tables 3A or 4A. If Regional disparities are to be removed instantaneously, we need only 17,060 teachers as against 124,240 (more than seven times) that are needed to do the same at district level. With population growth rate maintaining its 1981-1991 level, one would see that if Regional disparity is to be removed in 5 years, one needs additionally 44,000 teachers compared with 164,275 (nearly four times) for removal of districtwise disparity. For the target period of 10 years, the two figures are 74,339 for removal of Regional disparity, and 209,841 (nearly three times) for districtwise disparity. We know that in the 11 year period 1982-83 to 1993-94 the actual number of additional teachers fell slightly short of the former figure. *With an appropriate allocation of these additional teachers among the Regions*, the goal of removal of Regional disparity in this sector could have been achieved by now (1996).

4.49 The conclusion is inescapable that by lowering the level at which disparity is to be reckoned and remedied, from Regions to districts, depending upon the targeted number of years, the cost of removal of disparity has been increased manifold, or the goal has been pushed to a distant future.

4.50 This gives a clue, howsoever approximately, to what one should expect to happen if we magnify the phenomenon of disparity by recognising talukas, rather than districts, as the units for elimination of disparities among them. It is not suggested that the costs will increase four times or two times; that will depend upon intra-district variation which might be smaller than the intra-Region variation. However, one conclusion can be drawn: If generally intra-district variability is not large, the costs will not be manifold if we take taluka as the unit; but while planning to reduce inter-district disparity, the increased capacity in a district can be allocated in a suitable manner to reduce the intra-district variation also and, hence, there is no point in insisting on the lowering of the unit. On the other hand, if intra-district variation is large, then either you need

manifold resources, or with the resource constraint, you push the realisation of the goal to a more distant future.

Districtwise Allocation of Resources: An Alternative Method

4.51 So far, we have discussed the question of the real growth in the sector that is needed if disparity is to be eliminated in a given time-frame. The next question is about the appropriate distribution of this growth (in resources) among the districts in a manner consistent with the objective of elimination of disparity among them. For example, we saw in Table 3A that if disparity is to be eliminated in a period of 20 years, that is *four* Five Year Plans (FYP), we need to appoint additionally 321,147 primary teachers over this period. The Appendix explains in detail how to appropriately distribute this number among the districts. It points out that the FFC's formula for allocation needs to be changed and explains the alternative method that should be used for the purpose. Using the latter, it works out an exercise to illustrate how the allocation should be made.

SECTION V
CONCLUSIONS AND SUGGESTIONS

FFC's Approach and Its Consequences

5.1 The merits of the FFC's approach are several. It defined development and disparity in it in physical and, therefore, operationally meaningful terms rather than classifying districts, as many others have done, on a scale of development. Not getting ensnared in a vague concept of development, it addressed disparities in every sector and sub-sector of development separately. Further, it focussed attention only on government's efforts and actions thus binding results with them directly. Departing from the purely financial understanding of the remedy for reduction of disparity, it pointed out the physical development that was necessary for the purpose, quantified it and then indicated its financial implications. Choosing indicators carefully and consistently with its approach, it defined backwardness, backlog, and disparity in objective and quantifiable terms thus shearing them off the subjective and loaded meanings often attached to them.

5.2 With an indicator appropriately chosen for the sector or sub-sector, the FFC classified districts with indicator values less than the average indicator value (over all districts) as backlog districts and the others as non-backlog districts. The size of backlog of a former type of district was defined to be equal to the amount by which the numerator of the indicator for the district needed to be increased so as to make the district's indicator equal to the average. The total of such districtwise backlogs gave the aggregate backlog for the sector. It recommended that the Plan outlay on the schemes examined by it should be totally earmarked for removal of backlog except for a small (15 per cent) part to be used for on-going works or for meeting the needs of natural growth. This part was to be distributed over *all* districts in proportion to their population. The large part (85 per cent) should be allocated to only the backlog districts in proportion to their size of backlog. At the beginning of every Plan, the whole situation should be reviewed, the new indicator values and their averages worked out, a fresh classification of backlog districts made, their backlog calculated, and the procedure repeated.

5.3 In short, the FFC established direct links between the measurement of disparities and the specific actions that a government can take to reduce them, and provided a clear and unambiguous method of planning for reduction of disparities and of monitoring whether the desired changes take place.

5.4 The FFC chose to work within a given total of development funds and its sectoral allocation, and not to give a time-bound programme for removal of disparities. Rather, it suggested a *process* of resolution of the issue by repeated application of its approach plan after plan, which would, in its opinion, ultimately do away with disparities in the sectors and sub-sectors it considered.

5.5 But in all this, it did not analyse the effect of growth of population, where relevant, on the results generated by its backlog removal process. That, coupled with the constraint of externally determined size of resources, and its formula for their allocation, leads to such results as could be hardly foreseen by it, especially for the sectors of

social services such as education and health.

5.6 The third section illustrated the results that one should expect by a repeated application of the FFC's procedure over a long period (60 years). It showed that for primary education, with resource growth rate implicit in the Seventh Plan resources assumed by the FFC, the outcome would be neither reduction of disparity nor development and, in fact, drastic reduction of the level of development in *all* districts. Even the larger growth rate, implied by the actual increase in resources that materialised, leads to reduction in disparity due to *drastic reduction in the level of development in advanced districts*, with some overall growth initially, followed by a continuous decline later, and with considerable reversal of development, or stagnation, or little growth for nearly half the districts. The approach that generates such results can hardly merit the description of a strategy, either for development or for reduction of disparity. The two reasons for the unsatisfactory outcome of the FFC's approach are simple: 1) inadequate attention to effects of population growth even where the indicators are firmly related to population; and 2) independently determined resources delinked from the extent of disparity or population growth. Further, its formula for allocation of resources, not only for 'natural growth' but for backlog removal, also needs to be revised.

5.7 But the FFC cannot be faulted for not recognising the possible consequences of what it was recommending (for the Seventh FYP at least), nor for failing to visualise the effect of working under the constraint of given resources or the inter-relationship among the reduction in disparities, the rate of growth in the sector, which directly depends upon the rate of augmentation of resources devoted to it, and the growth in population. In fact, it was fully aware of them. For it clearly stated that:

'*Working within a given total of development funds, its sectoral allocation,* and given policies and programmes in the several sectors and focussing attention on the disparities and backlog, *has the advantage that action can be initiated without delay to remove the backlog.* It also implies a certain acceleration of the pace of

development in the districts lagging behind and to that extent a certain slowing down of the pace of development in the districts which are already ahead. There appears reluctance to admit this implication. It is important that it is recognised and stated explicitly' (emphasis added) [FFC, 1984, Para 3.35].

Also, when dealing with the allocation for natural growth in the sectors of social services, it clearly explained its conclusion and the reasons behind them in these words:

'The second ground on which some provision has to be made not related to removal of specific backlog is the needs of natural growth. These are large in the social services such as education and health; even to maintain the present level of these services, they must expand in proportion to population or say at the rate of 2 per cent per annum. We are again faced with a dilemma. The needs of natural growth are very large in some sectors such as education so much so that, if these are to be fully met, almost the entire plan funds will be committed to this purpose and little will be left to remove the backlog in the lagging districts. On the other hand, if the needs of the natural growth are not fully met, the level of services now reached will not be maintained. *The conclusion is inescapable. If the backlog of the districts lagging behind is to be removed or reduced, it may not be possible to maintain the present level of some of the services reached in some of the advanced districts'* (emphasis added) [FFC, 1984, Para 17.23].

It is obvious that, though it knew what the effects of its approach would be, the FFC did not think them to be so devastating in the long run.

5.8 It would be trite to state that there must be commensurate growth if disparities are to be removed unless they are sought to be removed by redistribution which in this case would mean deprivation of developed districts. Surely, the FFC did not intend that such an increasing deprivation be a 'continuous process.' It certainly did not expect that for over a period of 60 years, with the growth rate in resources implicit in its assumed size of resources for the Seventh FYP, the primary educational facilities of all districts will be drastically and continuously curtailed

(Table 2), or even with the growth rate in resources implicit in the resources actually applied to the sub-sector, those in the seven of the above-average districts will be drastically and continuously curtailed and of the four only marginally improved (Table 2A). It seems to have been guided by a naturally appealing, almost convincing common-sense approach that an allocation of a large percentage (85 per cent) of resources for removal of backlog, and the further allocation of such resources to below-average districts in proportion to their deficit, *plan after plan, will ultimately eliminate disparities.* Section III had shown that this will not happen; and if it appears to do so, it will be more by pulling down the advanced districts than by 'lifting the bottom' districts. Hardly a worthy fruit of any strategy of development or of removal of disparity! Thus, though aware of its limitations of having to work under the constraint of 'given resources', the FFC did not, in effect, clearly see the disappointing consequences of a continued pursuit of its approach, which, coupled with the resource constraint, provided miserably inadequately for population growth.

5.9 But the FFC did something that should cause concern. On the one hand, it did not foresee the *magnitude* of the effect of the interplay of the factors of resources, population growth, severity of disparity, and time-frame. On the other hand, it surprisingly went on, on its own momentum, not only to emphasise the desirable features of its approach but also to ask for its extension more widely and deeply. Thus, it stated

'This is a logical corollary of the approach we are suggesting. *Backwardness and underdevelopment must be identified and attended to wherever they exist* and not swept under the carpet of a district or regional average' (emphasis added) [FFC, 1984, Para 3.36].

Further, to recommend the extension of its approach to more sectors and at lower levels, it exhorted that

'The process shall thus continue from year to year during the period of the Seventh Five Year Plan. At the end of the Seventh Plan, the entire position should be reviewed. The exercise we have done to examine regional disparities in different fields and assess backlog of districts should be re-worked in an expanded, improved and more detailed form. *More sectors/sub-sectors/schemes/programmes should be chosen to examine disparities in development; the analysis should be carried wherever justified to taluka level;* and wherever necessary, other and more relevant indicators may be chosen to assess backlog. This should constitute the basis for continuing the process of reducing the disparities into the Eighth Five Year Plan. As we have emphasised, while explaining our Approach to this subject, *what we propose to initiate is not a programme* for removing a given backlog but a continuous *process of reducing disparities in development*. As the process continues, hopefully, what will emerge is an alternative strategy of development, namely, development by lifting the bottom rather than pulling up the top' (emphasis added) [FFC, 1984, Para 17.37].

And, it concluded the (third) chapter on its approach with the words:

'The problem of regional disparities has been with us for far too long. In approaching it with this alternative strategy, namely, development by lifting the bottom, we have a chance to make a new beginning' [FFC, 1984, Para 3.37].

5.10 There is a little bit of irony in all this. In pointing out that the problem of regional disparity has been 'with us ... too long', and calling for a new beginning, the FFC appeared to be on the verge of offering a long overdue solution to it, while it, in fact, created a *process of solution* that may not possibly have the desirable end. And in spite of this, by inviting, almost spurring, a search for identification of new disparities 'wherever they exist' it merely heightened the awareness of disparities and magnified the problem manifold by providing additional dimensions to dissatisfaction, discontent and disgruntlement, in each of which dimensions its solution, under 'given resources', could only be a continuous process without necessarily a promise of a satisfactory

redress. In effect, the continuity that the FFC introduced in its approach to removal of disparity was extended by it to a search for disparity across the limitless canvass of perception of development and disparities in it. As a result, it tended to contribute to keep the 'grievance' of backlog or disparity, whatever one chooses to call it, a festering political issue *ad infinitum*.

5.11 The FFC perhaps had a good reason for working under a constraint of given resources, for it perceived in it the 'advantage that action can be initiated without delay to remove the backlog' [FFC, 1984, Para 3.35]. But that was fine for its immediate purpose of initiating a course of action beginning with the Seventh FYP. For the same reason again, its disregard for population growth for a short period is also understandable. The same can be said about its resource allocation formula which merely reflected these two elements. But the FFC suggested an approach for a continuous process of removal of backlog, and the only later action or series of actions needed according to it was the updating of the situation at the beginning of the Eighth Plan, and the plans to follow. But there is not the mildest suggestion in the FFC's *Report* that for a long-term process - and that is what it fully recognised it to be - the questions of size of resources, the population growth and a consistent allocation formula cannot be kept out of consideration after the process is switched on with the Seventh FYP. As Section III has illustrated, if FFC's entire frame of approach is considered immutable - and the FFC did not even hint that it could be otherwise - the process leads to a very unsatisfactory situation. The FFC's invitation to treat many more sectors, sub-sectors, programmes and schemes likewise, and to lower the unit to sub-district level, leads one to conclude that it did not fully realise the consequences of its approach - not for the duration of the Seventh Plan, but - for the long term solution of the problem that it itself advocated. The conclusion is inescapable that, though it knew what the effects of its approach would be, the FFC did not imagine their enormity.

5.12 It should be clear that the FFC's approach is not satisfactory if pursued as a continuous process. The decision makers have two choices; one is to pursue the FFC's approach, without reviewing resource allocations over the sectors,

for as many sectors as possible reducing the unit to lower level and eliminate disparities in certain cases by a Procrustean solution of chopping off the tops of the developed districts, or units, to achieve equality. The other is to modify the FFC's approach so that the requirements of a more satisfactory solution are clearly indicated initially and worked out logically in the solution. Assuming that the latter could be an alternative worthy of examination, Section IV attempted, and this section continues that attempt, to work out such a solution.

Alternative Approach

5.13 Using the same illustrative example, the fourth section reformulated the solution to take full account of the inter-relationship of population growth and size of disparity on the one hand, and the size of resources and time-frame on the other, and to ensure that *the situation of any district does not deteriorate over time*. This new approach holds the indicator value of only that district, which had the maximum indicator value, fixed at its initial level till all other districts caught up with it. Assuming that the population of every district will maintain the growth rate as was observed for it from 1981 to 1991, the first exercise in Section IV worked out the number of years that will be required to eliminate disparity completely for different values of resource (number of primary teachers) and its growth rate. It showed that the disparity in primary teachers in relation to population was impossible to eliminate with the Seventh Five Year Plan resources assumed by the FFC and the continuation of the same implied growth rate in resources in future. The same conclusion emerged even when the actual number of additional teachers (and the corresponding implied growth rate) during the period 1982-83 to 1993-94 was used. The second exercise dealt with the obverse side of the problem and worked out the resources that will be needed if disparity were to be eliminated in specific periods of 5, 10, 15, 20, 25 and 30 years. It showed that, in primary education, the resources required have to be very large compared with what were assigned to it, if disparity is to be eliminated in a foreseeable period of 20 to 30 years.

5.14 The very largeness of resource requirement

prompted two investigations: One, whether a moderation of the goal of absolute equality would result in reducing resource requirement or in shortening the time-frame, and if so, by how much; and two, whether a decline in population growth rates would have a significant similar impact. The answer to the second question was not very encouraging inasmuch as the decline in population growth rate being, by its nature, a long-term process, its effect is not significantly large for a time-frame of 20 to 30 years. But, in the particular illustration of primary education, a moderated goal of equality among 24 of the 25 districts needed a very much smaller (50 per cent) amount of resources, or a considerably shorter time-frame, as compared to the goal of equality among all the 25 districts.

5.15 The exercise also showed that the FFC's formula for allocation of additional resources for 'natural growth' and backlog removal needs a complete revision. First, a large percentage of additional resources is needed to account for population growth where relevant, and the percentage naturally increases with the length of period in which disparity is to be eliminated. Fixing this percentage independently, as the FFC had done, is not consistent with the requirement that the situation of any district should not worsen. Second, the allocation of this component over districts should be equal to the additional number of teachers needed due to the growth in population. Third, the FFC's method of allocation of resources for backlog removal over the lagging districts needs a complete change. The alternative method, explained in the Appendix, aims at raising the indicator values of all the low indicator value districts to as high a level as the resources permit. It thus follows, more rigourously than the FFC's method for allocation of (85 per cent) of resources for backlog removal, the FFC's strategy of 'lifting the bottom rather than pulling up the top'.

5.16 Section IV also attempted to work out the implications of the FFC's recommendation to lower the unit of reckoning from a district to taluka by a reverse approach of studying the implications of raising the unit from a district to a Region. The exercise showed, for the illustrative case, the enormous increase in resource requirement when the unit was lowered from Region to

district. The assessment of the increase when the unit is lowered to taluka can be done only on the basis of taluka level data, but it would be obviously a significant multiple of the already large requirement of resources for elimination of disparity at the district level. If resources are not so increased it will only push the achievement of the goal of eliminating disparities (now perceived at the taluka level) much farther in time.

5.17 The exercise done in section IV abundantly makes it clear that one cannot, if one wants to be realistic, work under the constraint of given resources. One must fix a target for the period in which disparity will be removed and ensure a commensurate growth in the sector which in turn means investing necessary resources consistent with the targeted growth. As soon as the question of resources is thus shown to be germane to the whole gamut of elimination of disparities, the basic economic issue cannot be sidetracked. Since total resources will be always limited, one cannot escape the determination of priorities, which in practical terms means that one cannot do everything which one thinks it is desirable to do. One has to pick and choose. Before one decides, following the FFC's recommendation, to embark

upon removal of disparities in many more sectors than those which the FFC investigated, and by lowering as well the unit at which disparities are reckoned, one should first introduce the modifications in the approach that the exercise in Section IV developed and re-work the results for the sub-sectors the FFC considered and understand the implications. For that may show that such a haste in extension of the FFC's inadequate approach would not be exactly advisable as it would only increase the number of fields in which a practicable solution to disparity elimination cannot be applied. The present sub-section hereafter attempts to examine the implications of the alternative approach to those sub-sectors the FFC considered where population growth has a direct impact on the size of resources, and a few others where it does not, to establish the veracity of this assertion.

Implications of New Approach

5.18 Table 7 shows the percentage of backlog that the FFC expected would be removed during the Seventh FYP in the case of the 29 sub-sectors it studied.

TABLE 7. PERCENTAGE OF BACKLOG EXPECTED BY FFC TO BE REMOVED
DURING THE VII FIVE YEAR PLAN IN DIFFERENT SUB-SECTORS

Sr.No	Sector/Sub-sector/ Scheme/Programme	Percentage	Sr.No	Sector/Sub-sector/ Scheme/Programme	Percentage
	Roads			*Health*	
1.	Main	79.75	15.	Primary Sub-centres	142.90
2.	Other	37.42	16.	Primary Centres	....
3.	*Irrigation*	137.21	17.	Rural Cottage Hospitals	45.80
			18.	Hospital Beds	6.32
	Electrification			*Water Supply*	
4.	Rural	497.53	19.	Dug/Bore Wells	1,485.15
5.	Pump sets	141.67	20.	Piped - Problem Villages	278.58
	Education		21.	Piped - Other Villages	.....
6.	Primary	69.78	22.	Urban Water Supply	47.59
7.	Secondary	300.54			
8.	Pre-/University	115.07		*Land Development*	
9.	Adult	413.96	23.	CADA Works**	17.21
	Technical Education		24.	in non-CADA Areas	1,604.04
10.	I.T.I.s*	54.79	25.	Contour Bunding	14.70
11.	Technical High Schools	50.34	26.	Terracing	33.66
12.	Technical Training in		27.	Nala Bunding	66.43
	High Secondary Schools	2,066.90	28.	Land Dev. *cum*	
13.	Vocational Courses	4,741.07		Horticultural Development	102.58
14.	Polytechnics	33.17	29.	*Veterinary Institutes*	192.92

Notes: *I.T.I. = Industrial Training Institutes.
** CADA = Command Area Development Authority.
Source: *FFC Report*, Table 17.2, Column (7)

This percentage varied from *six* per cent to 4,741 per cent! It reflects in a way a product of two factors: the varying extent of disparity in the sub-sectors, and the varying relative allocation of resources to the sub-sectors expected in the Seventh Plan independent of the consideration of backlog and the requirement of its removal. Interestingly, while only 69.78 per cent of backlog was expected to be removed in primary education, 300 per cent of it in secondary education and 115 per cent in college education was expected to be removed in that Plan. Apparently, and understandably, what is of priority for reduction of disparity did not have a role in decisions about sectoral allocations. A percentage higher that 100 may not however be interpreted as elimination of disparity in the Seventh Plan itself; it merely showed that the below average districts can be pulled up to the average level or more (ignoring increase in population). We saw in the case of primary education that though the actual additional number of teachers during the Seventh Plan might have been nearly twice the amount of backlog, removal of disparity remained a distant prospect.

Real Growth

a) Sectors with Population Based Indicator

5.19 Of these 29 sub-sectors, excluding those of drinking water supply, *eight* - *three* of general education, *four* of technical education, and *one* of health services -. are such that growth in population necessitates a proportional increase in the numerators of the corresponding indicators if their values are to remain the same. The districtwise indicators for these eight sub-sectors are shown in Table 8.

One should note that the extent of disparity, as measured by the coefficient of variation, varies considerably among the sub-sectors. It is less for sub-sectors of general education and much larger for hospital beds and two sub-sectors of technical education.

5.20 For these eight sub-sectors, I worked out, as I have done for primary education, the period in terms of the number of five year plans (FYPs) required for elimination of districtwise disparity in each sub-sector, if the real growth rate expected to be planned in that sector in the (then) proposed Seventh FYP would be maintained in the subsequent FYPs.[24] The results are shown in Table 9. The first three columns of the table describe the sub-sector and the physical unit in which the FFC measured the numerator of the indicator for development in it. Column (4) shows the initial total number or quantity of the physical units described in Column (3). *The total disparity* shown in Column (5) equals the additional number or quantity of the same that needs to be created if disparity is to be eliminated instantaneously. This number equals in each case:

(Maximum *minus* average indicator)xTotal Population
Comparison of Column (5) with Column (4) helps one to gauge the extent of additional resources in relation to the existing stock that would be needed to eliminate disparity. The corresponding percentage is shown in parentheses in Column (5). In some practical sense, this tells one of the severity of the problem. Only in the sub-sectors of general education is this percentage less than 100.

5.21 The figures in Column (6) are obtained by using the figures of backlog (given in the corresponding table in the FFC's *Report*), the percentage of it that was expected to be removed in the Seventh FYP (Table 7), and the fact that this was 85 per cent of the total physical increase during the Seventh FYP. Paragraph 3.11 explained how the figure of the physical target of 10,552 primary teachers was thus worked out. As a second example, consider the case of secondary teachers. Table 9.4A of the FFC's *Report* shows the total backlog of secondary teachers to be 6,911; Table 7 shows that 300.54 per cent of this backlog will be covered in the proposed Seventh FYP, which means 20,770 teachers; but this figure is 85 per cent of the total number of secondary teachers that will be appointed during that Plan, giving the latter figure to be (20,770/0.85 =) 24,436, the figure shown in Column (6) of Table 9 here.

TABLE 8. INDICATOR VALUES FOR THE SECTORS OF GENERAL EDUCATION, TECHNICAL EDUCATION AND HEALTH

Sr. No.	District	Popula-tion 1981 (lakh)	General Education			Technical Education				Health
			1	2	3	4	5	6	7	8
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Gr.Bombay	82.43	-	-	-	19.51	-	-	-	-
2	Thane	33.52	292.76	165.92	19.61	49.17	93.99	12.53	8.95	150.17
3	Raigad	14.86	470.31	173.57	11.97	60.00	44.40	8.07	30.27	72.45
4	Ratnagiri	21.11	592.43	192.49	14.35	47.36	62.52	11.37	42.63	68.39
5	Nashik	29.92	364.67	190.62	30.62	50.14	52.14	16.04	38.44	69.22
6	Dhule	20.50	343.90	177.00	26.04	64.18	130.22	11.71	0.00	49.85
7	Jalgaon	26.18	392.78	193.14	32.77	38.80	170.34	46.60	5.73	47.55
8	Ahmednagar	27.08	393.46	188.97	30.57	31.90	59.45	16.25	7.38	69.53
9	Pune	41.64	359.42	196.81	38.85	58.97	90.77	28.33	18.01	222.53
10	Satara	20.39	472.46	221.91	38.41	94.96	94.67	34.34	4.91	64.55
11	Sangli	18.31	443.20	212.32	43.36	51.55	158.37	54.61	5.46	100.26
12	Solapur	26.10	375.46	154.51	29.27	28.19	104.98	31.42	22.99	107.04
13	Kolhapur	25.06	395.20	173.24	35.75	59.85	152.02	34.31	49.87	53.86
14	Aurangabad	24.33	326.21	152.87	36.86	44.71	50.55	19.73	51.36	73.72
15	Parbhani	18.29	228.71	124.25	13.50	25.80	55.76	6.56	10.93	33.89
16	Beed	14.86	280.41	149.32	29.47	40.37	88.83	16.15	10.09	61.37
17	Nanded	17.49	285.54	152.34	29.90	45.50	48.02	13.72	34.30	47.22
18	Osmanabad	22.31	357.79	213.08	31.52	49.67	63.21	16.14	29.14	31.56
19	Buldhana	15.09	345.84	166.63	13.65	44.80	43.74	7.95	9.94	51.23
20	Akola	18.27	357.81	188.35	22.88	43.19	32.84	13.14	27.37	80.19
21	Amravati	18.61	379.98	208.12	42.06	62.96	16.12	6.45	75.21	153.97
22	Yavatmal	17.37	357.02	154.25	19.17	32.46	37.99	6.91	31.66	63.48
23	Wardha	9.27	366.82	242.60	25.36	64.32	125.19	47.48	53.96	182.17
24	Nagpur	25.89	311.73	267.57	54.08	59.18	60.65	13.13	38.63	207.74
25	Bhandara	18.38	319.93	166.96	13.77	44.62	62.04	13.06	5.44	56.22
26	Chandrapur	20.56	321.02	132.37	18.29	38.14	43.78	17.51	43.78	59.40
	Average		364.64	182.98	29.23	45.25	79.57	20.43	25.48	93.03
	Std. Dev.		69.23	31.53	10.61	16.47	40.29	12.63	18.59	57.44
	Coeff. of Var.		18.99	17.24	36.31	36.39	50.64	61.84	72.95	61.74
	Backlog*		12,853	6,911	2,264	4,439	9,154	2,811	4,344	7,560

Note: Except for I.T.I., Greater Bombay is excluded from analysis.
All Indicators per lakh of population:- 1. No. of primary teachers; 2. No. of secondary teachers; 3. Colleges & junior colleges; 4. Industrial training institute - sanctioned strength; 5. Technical high schools & centres - Student intake; 6. Govt. & Govt. aided higher secondary schools - sanctioned strength; 7. Vocational courses - intake capacity; 8. Hospital beds.
Total population 627.82 lakh, and 545.39 lakh with exclusion of Greater Bombay.
* In units of the numerator of the indicator.

TABLE 9. NUMBER OF FIVE YEAR PLANS IN WHICH DISTRICT LEVEL DISPARITY WILL BE
ELIMINATED IF RESOURCES IN REAL TERMS GROW AT THE SAME RATE AS IN VII FYP

Sr. No.	Sector/ Sub-sector	Number/ Quantity	Initial Total Number	Initial Total Disparity Number (%)	VII FYP Additions	VII FYP Growth Rate (%)	No. of FYPs Required
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	General Education						
1.	Primary	Teachers	198,868	124,237 (62.5)	10,552	5.31	IMP
2.	Secondary	Teachers	99,795	46,135 (46.2)	24,436	24.49	4
3.	Colleges/Junior Colleges	Teachers	15,940	13,554 (85.0)	3,065	19.23	13
	Technical Education						
4.	I.T.I.	Students*	28,411	31,206 (109.8)	2,861	10.07	IMP
5.	Tech.High Schools/Centres	Students@	43,399	49,502 (114.1)	5,421	12.49	IMP
6.	Technical Training	Students*	11,140	18,644 (167.4)	68,354	613.59	1
7.	Vocational Courses	Students@	13,899	27,120 (195.1)	242,297	1743.27	1
	Health						
8.	Hospital	Beds	50,740	70,626 (139.2)	648	1.28	IMP

Notes: 1. Except for item 4 (I.T.I), Greater Bombay is excluded for all sub-sectors.
2. Col.(5) = (Maximum - Average Ind.) x Total Population; figures in parentheses show percentage to Col.(4).
3. Col.(7) = Col.(6) expressed as per cent of Col.(4).
4. IMP = Impossible.
* Sanctioned strength
@ Student intake capacity

5.22 Column (7) shows the 5-year growth that will be thus achieved in physical terms by expressing figures in Column (6) as percentage of those in Column (4). Assuming that the additional resources grow at the same rate in plan after plan, Column (8) shows the number of FYPs (including the Seventh FYP) in which disparity will be eliminated in every sector.

5.23 The results in Column (8) show the relationship between resources and the period taken for disparity elimination. With a tremendous growth in relation to the initial stock planned in the Seventh FYP, the disparities in two of the sub-sectors of technical education, technical training and vocational courses, should have been hopefully eliminated in the Seventh FYP itself. This should be checked against the facts of actual achievement. In the case of secondary education, with a growth rate of 24.5 per cent per 5-year period, elimination of disparity can be achieved in four plans, that is, by the end of the Tenth FYP, not certainly a very distant prospect.

5.24 But in the case of colleges and junior colleges, disparity-elimination will take 13 FYPs! And in the case of primary education, I.T.I's, Technical schools, and hospital beds, it will be impossible to achieve that goal if resources grow at the same rate at which they were expected to grow in the Seventh FYP! The reason is not difficult to see; the resource growth rate, in each case, does not even exceed the rate at which population would increase in a 5-year period (about 12.5 per cent).

TABLE 10. PER CENT GROWTH RATE *PER 5-YEAR PERIOD* NEEDED IN REAL TERMS TO ELIMINATE DISTRICT LEVEL DISPARITIES IN A GIVEN NUMBER OF FIVE YEAR PLANS (FYPS) FOR DIFFERENT SECTORS

ALL INDICATORS: NUMBERS PER LAKH OF POPULATION

Sr. No.	Sector	Number/ Quantity	Initial Total No.	Initial Dispa- rity	Growth Rate *per FYP* by Number of FYPs (%)					
					1	2	3	4	5	6
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	General Education									
1.	Primary	Teachers	198,868	124,237	82.60 (14.45)	43.36 (24.12)	32.31 (31.00)	27.16 (36.08)	24.21 (39.95)	22.31 (42.95)
2.	Secondary	Teachers	99,795	46,135	64.35 (19.00)	36.00 (30.74)	27.75 (38.65)	23.86 (44.30)	21.62 (48.49)	20.18 (51.70)
3.	Colleges/Junior Colleges	Teachers	15,940	13,554	107.96 (11.53)	52.99 (19.82)	38.17 (26.03)	31.36 (30.80)	27.48 (34.54)	24.99 (37.53)
	Technical Educa- tion									
4.	I.T.I.	Students*	28,411	31,206	135.11 (9.00)	62.41 (15.86)	43.63 (21.24)	35.12 (25.55)	30.30 (29.07)	27.21 (31.97)
5.	Tech.High Schools/Centres	Students@	43,399	49,502	140.59 (8.80)	64.55 (15.49)	45.05 (20.73)	36.24 (24.91)	31.25 (28.32)	28.07 (31.13)
	Health									
6.	Hospital	Beds	50,740	70,626	168.83 (7.85)	73.94 (14.06)	50.52 (19.10)	40.07 (23.26)	34.20 (26.77)	30.46 (29.77)

Notes: 1) Figures in parentheses show per cent allocation for population growth.
      2) Except for item 4 (I.T.I), Greater Bombay is excluded for all sub-sectors.
      *   Sanctioned strength.
      @ Student intake capacity.

5.25 That should make us ask ourselves the question about the necessary amount of additional resources if disparity elimination is to be achieved in a reasonable period of time. Table 10 answers that question in respect of these eight sub-sectors excluding the two in which disparity should have been eliminated in the Seventh FYP itself.

5.26 The table reproduces the first five Columns of Table 9. Columns (6) to (11) show the growth rate per 5-year period by which the initial stock shown in Column (4) has to increase if disparity is to be eliminated in one, two, three up to six FYPs, that is in five to 30 years. The growth at the rates shown in these columns has to be maintained in every successive FYP starting with the Seventh FYP. Thus, if disparity in primary education is to be eliminated in *four* FYPs, the number of primary teachers to be additionally

appointed in successive FYPs should be,

VII FYP: 54,013 (i.e., 27.16 per cent of 198,868)
VIII FYP: 68,682 (i.e., 27.16 per cent *larger than* 54,013)
IX FYP: 87,336 (i.e., 27.16 per cent *larger than* 68,682)
X FYP: 111,057 (i.e., 27.16 per cent *larger than* 87,336)
Total over four plans = 321,088

As one moves from Column (6) to (11) one notices that the growth rate declines as the target number of FYPs for disparity elimination increases; but then the growth has to be maintained over a longer period of time at that rate. A comparison of the required growth rates with those proposed in the Seventh FYP [Table 9, Column (7)] shows how totally inadequate the latter were in respect of all sub-sectors except secondary education, if disparities in them were to be eliminated in four to six FYPs starting with the Seventh FYP.

5.27 The figures in parentheses in the Columns (6) to (11) show the percentage of the additional

resources that will be claimed by population growth. Expectedly, this percentage increases as we set a more distant point of time to achieve disparity elimination.

Plan Outlay

5.28 Table 11 uses the results worked out in Table 10 to display the implications for the Seventh FYP outlay of setting the period for disparity elimination as four, five and six FYPs, respectively, (including the Seventh FYP). The figures in Column (3) are copied from Column

(6) of Table 9, and those in Column (4) from Column (5) of Table 17.2 of the FFC's *Report* which showed the expected Seventh FYP outlay on the respective sub-sectors.

5.29 Columns (5), (7), and (9) are filled by applying the percentages shown in Columns (8) to (10), respectively, of Table 10 to the figures in its Column (4). The outlay figures in Columns (6), (8), and (10) of Table 11 are worked out by using the unit cost norms worked out by dividing the figures in Columns (4) of this table by those in Column (3).

TABLE 11. PHYSICAL AND FINANCIAL RESOURCES NEEDED IN VII PLAN FOR TARGETED NUMBER OF
FYPS IN WHICH DISTRICTWISE DISPARITIES ARE TO BE ELIMINATED

Sector/ Sub-sector		Proposed VII Plan Resources		Resources Needed in the VII FYP According to Targeted Number of FYPs					
				4 FYPs		5 FYPs		6 FYPs	
		Physical*	Rs (crore)	Physical*	Rs (crore)	Physical*	Rs (crore)	Physical*	Rs (crore)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	General Education								
1.	Primary	10,552	47	54,013	243	48,146	217	44,367	200
2.	Secondary	24,436	165	23,811	161	21,576	146	20,139	136
3.	Colleges/Junior Colleges	3,065	41	4,999	68	4,380	59	3,983	54
Sub-Total			253		471		422		390
	Technical Education								
4.	I.T.I.	2,861	38	9,978	133	8,609	114	7,731	103
5.	Tech.High School	5,421	9	15,728	26	13,562	23	12,182	20
Sub-Total			47		159		137		123
	Health								
6.	Hospital Beds	648	20	20,332	628	17,353	536	15,455	477
Total			320		1,258		1,095		990

Notes: * Description of physical units same as in Table 8.
Except for item 4 (I.T.I), Greater Bombay is excluded for all sub-sectors.

5.30 Table 11 shows that with the proposed plan outlay and a commitment to maintain the same real growth rate in the subsequent plans, disparity in secondary education can be eliminated in four FYPs including the Seventh. But to do the same in *five* FYPs for colleges and junior colleges, the outlay in the Seventh FYP had to be 1.5 times the

proposed one, and the same real growth maintained in the subsequent plans. For the sub-sector of technical high schools, similarly the outlay has to be 2.5 times; but the outlay itself is rather small to begin with.

5.31 But the absolute inadequacy of resources expected in the Seventh FYP is seen in the case

of primary education, the sanctioned strength of ITIs and hospital beds. With a relatively distant goal of disparity elimination in 25 years, that is in *five* FYPs, the outlays have to be three to twentyseven times the expected outlay *with the further commitment that the greatly increased real growth rate should be maintained all through.* If the inter-relationship of resources and the time-frame for elimination of disparities needed any elucidation, these three glaring cases should be more than sufficient.

5.32 In sum, if for the six sub-sectors disparity is to be eliminated in *five* FYPs, the total outlay on them has to be increased from Rs 320 crore to Rs 1,095 crore, the largest increase (Rs 516 crore) being required for hospital beds. They will then account for nearly 50 per cent of the expected total Seventh Plan outlay of Rs 2,164 crore on all sectors and sub-sectors the FFC studied, excluding the sector of irrigation and the four sub-sectors of drinking water supply.

b) Other Sectors

5.33 So far the discussion has exclusively covered those sub-sectors where the FFC's indicators were such that growth in population demands a proportionate increase in the government's activities whose measures enter the numerators of the indicators. But not all sub-sectors considered by the FFC were of this type. For some of them the indicator was not based on population but potential area or numbers for the corresponding activity. (For example, electrification of villages or potential for contour bunding.) Further even when the indicator was based on population, population growth by itself may not require, at least for a long enough time, an increase in government's activity. For example, the FFC used percentage of rural population connected to main road system as an indicator for the subsector of other roads. Though this indicator was thus based on population, it was merely for inter-district comparison. In operational terms, it was the villages which needed to be so connected. Growth in population over the years does not necessarily require more or longer roads to be

built. Even in such sub-sectors however, the relationship between resources, their growth and the time-frame holds good and needs to be clearly understood. Table 12 shows the analysis for a few such sub-sectors studied by the FFC.

5.34 Table 12 is similar to Table 9 and shows the unit in which the numerator of the indicator was measured for the eight sub-sectors. It shows in its Column (4) the achievement in terms of the total number of such units, the size of initial disparity and its percentage to the initial total in Column (5), the addition in terms of these units which was expected to be made during the Seventh FYP and the corresponding outlay (in crores of rupees) in Column (6), the percentage that this (additional) physical achievement forms of the total size of initial stock [Column (4)] in Column (7), and assuming that the same 5-year growth rate will be maintained in the subsequent plans, the number of five year plans that will be needed to eliminate districtwise disparity completely, in Column (8).

5.35 The calculation of the last number is very simple in this case. As explained in paragraph 4.4, it involves a simple compound interest arithmetic expressed by its first equation. For example, in the case of the sub-sector of other roads, 17,968 villages had been initially connected to the main roads system. To eliminate district level disparity in this respect, 14,661 additional villages needed to be so connected, which forms 81.60 per cent of the initial number. When this would be done, the total number of connected villages would have been 1.8160 times their initial number. During the Seventh FYP 1,411 additional villages were expected to be connected which forms 7.85 per cent of the initial number. If in the subsequent plans this growth rate is maintained till disparity is completely eliminated, the number of plans, *n* (including the Seventh Plan), required to eliminate disparity is determined by the compound interest equation:

$$(1 + 0.0785)^n = 1.8160$$

giving *n* = 7.89, which rounded to the next integer gives 8, the number shown in the last column.

TABLE 12. NUMBER OF FYPS IN WHICH DISTRICTWISE DISPARITY WILL BE ELIMINATED IF RESOURCES IN REAL TERMS GROW AT THE SAME RATE AS IN VII FYP FOR SUB-SECTORS UNAFFECTED BY POPULATION GROWTH

Sr. No.	Sector/ Sub-sector	Number/ Quantity	Initial Total Number	Initial Total Disparity Number (%)	VII FYP Additions/ (Outlay Rs Crore)	VII FYP Growth Rate (%)	No. of FYPs Required
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Other Roads	Villages	17,968	14,661 *(81.6)*	1,411 *(211.7)*	7.85	8
2.	Rural Electri-fication**	Villages	30,865	4,913 *(15.9)*	*	*	*
3.	Energisation of pump sets	Pumpsets	790,645	1,061,364 *(134.2)*	238,147 *(464.4)*	30.12	4
4.	Primary Health Sub-centres**	Sub-centres	5,751	1,737 *(30.2)*	429 *(10.3)*	7.46	4
5.	Contour Bunding (Potential)	Area in lakh hectares	87.23	37.64 *(43.1)*	1.68 *(11.4)*	1.93	19
6.	Terracing (Potential)	Area in lakh hectares	1.85	6.82 *(368.6)*	0.25 *(14.0)*	13.49	13
7.	Nala Bunding (Potential)	Works number	36,209	8,732 *(24.1)*	3,802 *(28.5)*	10.50	3
8.	Land Dev. *cum* Horticultural Dev.(Potential)	Area in lakh hectares	95,566	438,155 *(458.5)*	9,938 *(5.1)*	10.40	18

Notes:1. Col.(5), = (Maximum - Average Ind.) x Total of Denominator; figures in parentheses show percentage to Col.(4).
2. Col.(6), figures in parentheses show VII FYP outlay in crores of rupees.
3. Col.(7) = Col.(6) expressed as per cent of Col.(4).
* Disparity expected to be removed in the VII Plan.
** Separate calculations done for Tribal and non-Tribal areas; combined results shown.

5.36 The calculations show that for the sub-sectors of electrification of agricultural pump sets, primary health sub-centres and *nala* bunding, disparity will be eliminated in three to four FYPs. For rural electrification, it must have been eliminated in the Seventh Plan itself. But for the sub-sector of other roads system it will take *eight* plans to achieve that result, for contour bunding 19, for terracing 13, and for land-development *cum* horticultural development 18 plans. If disparity is to be eliminated in these four sub-sectors in (say) *five* FYPs, a little arithmetic will show that in the Seventh Plan the resources have to be 1.61 times their expected value for other roads (i.e., Rs 341 crore), 3.85 times for contour bunding (i.e., Rs 44 crore), 2.68 times for terracing (i.e., Rs 38 crore), and 3.97 times for land development *cum* horticultural development (i.e., Rs 20 crore), and the same implied

real growth rate will have to be maintained in the subsequent four plans. The total allocation to these four sub-sectors, which was expected to be Rs 242 crore, will have to increase to Rs 443 crore, nearly double its original amount.

5.37 In the case of sub-sectors where growth in population by itself requires a proportionately large increase in government activity, it is to be expected that that factor alone will make a substantial demand on resources in any scheme for elimination of disparity. But, as the above calculations show, even in some of the sub-sectors where that factor is not relevant, a target of a reasonable time-frame will demand much larger resources and an implied higher growth rate in them than what the Seventh Plan outlay implied. Putting these results with those of calculations for sub-sectors of general education, the two sub-sectors of technical education and hospital beds

(refer paragraph 5.32), we see that the total outlay on all of them have to be increased from Rs 562 crore to Rs 1,538 crore. We have not considered the important sector of domestic water supply, with an expected Seventh Plan outlay of Rs 932 crore, where the indicator is based on population and the government's activity has to keep pace with population growth. Excluding the sectors of water supply and irrigation (which accounts for a massive outlay of Rs 3,356 crore, the expected Seventh Plan outlay on the remaining of the 29 sub-sectors the FFC considered was Rs 2,164 crore. If one plans to eliminate disparities in *five* FYPs, which is certainly not near future, only in the sub-sectors considered in this paper, after omitting those in which disparity is expected to be removed much earlier, one needs to increase the Seventh Plan outlay on them to nearly 71 per cent of the total available outlay of Rs 2,164 crore. Clearly, with a modest target of a 25 years' time-frame, resources will fall very much short of the requirement to eliminate disparities even for some of the sub-sectors the FFC covered. Given this hard fact, following the FFC's recommendation, to add more schemes for inspection and elimination of disparities and to look more minutely for them by lowering the unit, will be an overzealous pursuit of an unrealistic goal.

Allocation of Resources Among Districts

5.38 The method of allocation of resources to the districts directly emerges from the basic conditions that are assumed to be fulfilled in the new approach. (See paragraphs 4.2 and 5.13). Providing fully for the population growth where relevant, the method of allocation, fully explained in the Appendix, rigorously puts into practice the FFC's development strategy of raising the level of development of the most deprived rather than that of the relatively more developed districts.

Issues for Consideration

5.39 It has been amply demonstrated that the issue of elimination of regional disparities cannot be realistically addressed to in the long run without commitment of commensurate resources. The necessary resources, in most cases, will be a large enough multiple of what the state was likely to assign to the relevant sub-sectors without explicitly recognising the relationship between the size of resources and time frame, or without setting up such a time-frame. The large demand for resources forces consideration of certain aspects of the issue of regional disparities and their elimination.

Near versus *Complete Equality*

5.40 Section IV illustrates, in the case of primary education, that with the moderation of the goal of complete equality to near equality, when disparity is removed from among 24 of the 25 districts, the requirement of resources for achieving the moderated goal is just half the original one. A similar exercise was carried out for the six sub-sectors covered by Tables 10 and 11 to work out the number of districts (with the lowest indicator values) the disparity among which will be eliminated with about half the amount of resources that are required for complete elimination of disparity among all districts.[25] As before, the calculation was based on the initial position and applies to instantaneous elimination of disparity. This percentage will increase, as Table 4A showed, when the time-frame lengthens. But it is a good pointer to what one can achieve with much smaller quantity of resources, or alternatively, within a shorter time-frame. The results of the exercise showed that with about half the resources that will be required for complete elimination of disparity, the number of lowest value districts among which disparity will be eliminated will be as follows: Primary education: *24*; Secondary education: *23*; College/Junior Colleges: *22*; I.T.Is: *24*; Tech. High Schools/Centres: *20*; and Hospital beds: *21*

5.41 Thus, considerable reduction in disparities will be effected with a much smaller use of resources. In practical terms, what it means is that one has two options: One may plan for total removal of disparity, but after a certain stage, when disparity is eliminated among such a large number of districts, one will have a choice whether to insist on complete elimination of disparity in the particular sub-sector with further

doses of resources, or to remove the sub-sector from the concerns of disparity elimination and devote attention to another worthy sub-sector. In the latter case the only requirement will be to ensure that after attaining such near equality, sufficient additional resources are devoted to the sub-sector for population growth and their proper distribution over the districts so that the attained indicator values are maintained or grow at the desired rate.

5.42 The other option is to initially set not the goal of complete equality at all, but only the reduced goal itself. This would make much less demand on resources to begin with for the same time frame (as for complete elimination). It would enable a larger coverage of sub-sectors from the start. Either option offers a larger coverage of sub-sectors; the first sequentially, the other simultaneously, with a compromise on time-frame: shorter in the first case and longer in the second.

Unit: Region, District, or Taluka ?

5.43 Section IV showed that the lowering of the unit from Region to district increases the requirement of resources manifold. The relative increase in the requirement of resources when the unit is lowered from district to taluka will vary directly with the extent of disparities among talukas within districts which may be different for different sectors. One needs taluka-level data, which were not available to the FFC and to the present author, to work out the exact implications for resources of adopting taluka as the unit.

5.44 Some indication is however available from the FFC's *Report* itself for the sector of irrigation. The district-level backlog (as on June 30, 1982) worked out at 924.29 thousand standard *rabi* equivalent hectares [FFC, 1984, Table 7.5], and 1,385.92 thousand standard *rabi* equivalent hectares at taluka-level [FFC, 1984, Table 7.7], an increase of almost 50 per cent. But this is an underestimate because the FFC took into account only the drought-prone talukas. Further, one must note that these are 'backlog' figures and not of 'total disparity' which are relevant for the new

approach (See paragraph 4.15).

5.45 I have tried to work out the increase in the size of total disparity, when the unit is lowered from district to taluka, by using data on literacy rates of 1991 population Census of Maharashtra.[26] The Census considered persons aged 7 years and above for defining literacy rate. The total population of such persons was 568.55 lakh in the state excluding Greater Bombay district. The average literacy rate for this population was 62.20 per cent. The district-level maximum literacy rate was 75.81 per cent (for Sindhudurg), and the taluka-level maximum rate was 82.22 per cent (for Thane taluka of Thane district). The total district-level disparity thus works out at (75.81 - 62.20)x568.55 = 77.38 lakh literate persons, and at taluka-level, (82.22 - 62.20)x568.55 = 113.82 lakh literate persons, an increase of 47 per cent.

5.46 Both these two cases give an idea that the lowering of the unit from district to taluka will need a substantially large increase in resources for elimination of disparity at the taluka level or push the goal of elimination of disparity to a more distant point in future. Obviously, lowering the unit across the board is not exactly a practicable action. Nor did the FFC suggest it.

5.47 It is important to exactly understand the FFC's views on the subject of unit. It was the very first aspect of the approach to the problem of disparities that the FFC dealt with [FFC, 1984, Paras 3.2-3.6]. After showing why the historically recognised Regions of Maharashtra would not be suitable for a programme of elimination of disparity, and not agreeing fully with the National Committee on Development of Backward Areas that the unit should be a development block for all sectors, the FFC came to the conclusion that the unit should be different for different sectors depending upon the levels of development reached in them. *Where the level is high enough, development is expected to have* achieved a wide enough spread and the unit should be lowered *to taluka or development block.* Thus, for sectors of primary education, primary health care services, village roads, drinking water supply, rural electrification, agricultural and veterinary services, and co-operation, the unit, according to the FFC,

should be taluka. But it should be district for secondary education, technical education, hospitals and major roads; and suitable numbers of divisions of Vidarbha and the rest of Maharashtra, and the Marathwada Region as a whole, for university and professional education, and state and national highways. The FFC concluded by saying: 'Thus, there does not appear any single unit appropriate for a discussion of disparities in development in all fields. The choice of unit must be so made as will make the analysis of disparities relevant and operationally meaningful in terms of planning and administrative action' [FFC, 1984, Para 3.6].

5.48 It is difficult to disagree with the FFC's analysis of the issue. All the same, for some of the sectors for which the FFC considered taluka to be an appropriate unit, I have shown in the foregoing the massive increase in resources that would be needed just to eliminate disparities at the district level in not so short a span of 25 years. As a reasonable guess, one may expect that lowering the unit in their case to taluka would possibly multiply this requirement by a factor of 1.5. The hard question is whether such a large amount of resources would be available for five plans in succession.

5.49 But adequate resources is only one necessary thing, although an important pre-requisite, for the solution. What is also important is the suitable unit of operational planning. It is that which the FFC emphasised upon in its discussion of the issue. For those sectors where taluka is the appropriate unit, a part of taluka-level disparity can be removed in the process of removing district-level disparity by treating the taluka as a planning unit for that sub-sector. Under the dispensation of the new approach suggested in this paper, allocation of resources for population growth (where relevant) will be made to all districts and the size of this part does not depend upon whether the district or taluka is the unit. This part should be correspondingly allocated to all talukas of every district. The allocation for disparity removal to a district only means a certain amount of (real) resources to be used in the district; its effect on the district's indicator value

is neutral to how that part is allocated among the talukas of the district. The District Planning and Development Councils should be directed to make the talukawise allocation of this part in such a manner as to reduce the inter-taluka disparities within districts. They will do this by a logical extension of the approach suggested in this paper to the talukas within a district for the allocation of the district's resources to talukas. This will ensure that a considerable portion - between one half to two-thirds, as a good guess - of the total taluka-level disparity will be removed in the process of eliminating district-level disparities.

Scope of the Concept of Development

5.50 As mentioned in paragraph 5.9, the FFC went on to recommend that 'More sectors/sub-sectors/schemes/programmes should be chosen to examine disparities in development;' ... [FFC, 1984, Para 17.37]. This was rather rash. First, the recommendation was made without working out the implications, either for resources or time-frame, or of the outcomes of its approach to the sub-sectors it covered. Second, and worse, it can open a Pandora's box to look for disparities in every nook and corner of the entire edifice of government's development plans and programmes and encourage identification of disparities in any and all sort of schemes, such as study tours of farmers conducted per lakh of population in the district (in the sector of agriculture), number of nurseries or saplings in the district compared with the state average (social forestry), or number of primary health centres not provided with vehicles. Some modicum of reasonableness to distinguish between a sub-sector of development and an operational detail of implementation of a development scheme must enter into the selection of a field of development for study of disparities and planning for their elimination. Clearly, at any point of time, in the operation of schemes, in some respect or the other, everything will not be the same or equal in all districts. It is reducing the sublime to the ridiculous to treat such short term differences as disparities in development and elevate them to that level of concern for redress.

The FFC's unfortunate use of the term 'schemes' is open to such a possible absurd extension by those in search of disparities for disparities' sake. 5.51 Also, for development in a particular sector, especially an economic sector, there arises the question of an appropriate mix of available technological options; greater emphasis on land development or on use of improved agricultural inputs, for example. The FFC's approach, blindly followed, may bring it in conflict with the process of determining the best among the possible strategies for development of a particular sector in a particular area. Whether such development activities, which have technological alternatives without affecting the end result of development, should at all be examined for incidence of disparities is a moot point and could be seriously questioned by experts in the particular field of development. The FFC's inclusion of land development activities such as contour bunding and terracing appear to be border-line cases. Extending the scope to all schemes of development will cease to have operational significance, the essential merit of the FFC's work.

5.52 The greater danger in such an extension lies in losing sight of priorities. As said before, with no consideration given to resource needs or time-frame for disparity removal in any sub-sector, it will only lead to a scenario of a plethora of apparent causes for discontent and nothing being possible to be done about any of them in a foreseeable future. This will dilute and render ineffective the concrete approach the FFC initiated to directly address the issue of disparities. Such a dilution should be discouraged.

Time-Frame

5.53 The exercises done in this section showed the large amount of resources needed if disparities are to be eliminated in certain sectors and sub-sectors in 25 years. There is no intention to suggest that this should be an acceptable time-frame for all sectors. In fact it could be, and should be, different for different sectors. Nearly half a century has passed since Independence, and more than three decades since the formation of the State of Maharashtra. In a field such as primary education, it is only fair to expect that the state ensure that a child born to-day anywhere in the state is provided by the government with an equal service to receive primary education. And we are talking about only an equal service, a relative measure, and not about that which should be according to educationists' norm. A period of 25 years is too long for elimination of disparities in primary education; one may reasonably place it at no more than 10 years. For drinking water supply, it should be as short a period as possible. And the unit for ensuring lack of disparity in their respect should be set at as low a level as one could think operationally feasible, even a village or village group.

Population Growth

5.54 But that is one aspect of what should be done. The other silent factor in the case of social services sectors, such as education and health, which has not only entered the calculations made here in their respect, but which will also be operating against the success of all plans for disparity elimination and, therefore, must also merit the attention of the government, is the factor of population growth. It was mentioned before that the 1981-1991 growth rate of population of backlog districts was larger than that of the non-backlog districts. The growth rate was also larger for the districts of the Marathwada Region and the highest for that Region as whole among the main Regions of the state. For elimination of disparities in the sectors of social services, a large part of resources is accounted for by growth in population just to maintain the existing position. It also sets a minimum rate of growth for these sectors which in turn means a large minimum of resources. A ceaseless pursuit of population policy and a planned reduction in this growth rate are as much materially important for reduction of developmental disparities and their eventual elimination in these sectors as for their development itself. And it works the other way round too. For, an evenly spread out development in the fields of literacy, primary education and primary

health services significantly contributes to the
success of the implementation of a population
policy; one could even say, it is a pre-requisite for
that policy to succeed. This mutual relationship
should dictate the priority that should be assigned
to these sectors for elimination of disparity in
them.

Summing Up

5.55 The approach to the resolution of the
problem of regional disparities, the number of
fields of development to be considered for
examination of disparities, the availability of
necessary resources, the time-frame within which
the problem is to be resolved, and the unit for
reckoning disparities are all inter-related. For
some sectors the growth in population is an
inextricable factor that must be built into this
inter-relationship. Without taking account of the
full implications of this inter-relationship, the
FFC developed an approach which could be
considered satisfactory for the immediate pur-
poses of the then upcoming Seventh FYP. Its
short-term adverse effects on advanced districts,
in the case of sectors where the indicator is firmly
related to population, could be considered as
counterbalanced by the merit of feasibility of
prompt action that it made possible. But, as has
been shown in this paper, if the approach is
followed as a continuous process, as recom-
mended by the FFC, it may end for these sectors
with neither development nor removal of
disparities, and if the latter happens it would be
more by a continuous down-gradation of
advanced districts and much less by the up-
gradation of the initially lagging districts. In other
sectors, without commensurate resources, the
goal of elimination of disparities will remain a
distant promise.

5.56 The new approach suggested in the paper is
firmly based on the inter-relationship of all
aspects and works out its logical implications. It
considers it reasonable to assume, if one is serious
about the whole issue, that there has to be a
decision on the time-frame within which disparity
is to be eliminated in a particular sector. With this

as a starting point, it then provides for the factor
of population growth fully for the sector of social
services, such as education and health. For all
sectors it then establishes that the time-frame, the
number of sectors to be brought within the net of
disparity elimination process, the unit for reck-
oning disparities, and finally the size of resources
cannot be independently determined. Shortening
the time frame, increasing the number of sectors,
and lowering the unit will all entail huge costs.
The fact that funds for development will always
be limited will force a decision on the selection
of options in each of these respects. Even the
objective of complete elimination of disparity
may need to be moderated. The paper directly
links the solution to the resolution of the issue of
disparities in development in any sector to the rate
of growth in development itself in that sector.

5.57 The limitation of the totality of plan
resources thus forces one *not* to treat the issue of
disparities in development as a separate adjunct
of development but as a vital part of it. This means
that the mere achievement of consistency of a
solution - the consistency of resources with time
frame, level of unit, population growth where
relevant, and number of sectors covered - does
not make it a desirable goal. For, it is possible to
choose a soft option, because of resource con-
straint, of deciding to eliminate Regional dispa-
rities rather than those at the district level. It can
be easily worked out that in many sectors this
diluted goal can be achieved swiftly or would
need very much smaller amount of resource for a
given time-frame. This might be politically
desirable but could be inimical to the interests of
people at large. For it might lead to polarisation
of development within the microcosm of a Region
and not necessarily ensure the even spread of
development to the appropriately lowest of the
levels which the character of the development of
a particular sector demands. Consistency by itself
is thus not enough. A worthy policy of develop-
ment of a particular sector, such as primary
education or health services, and the elimination
of disparity in development in it among the
smallest of the population groups should be the
starting point. Consistency should then be the

quality that a solution to the properly perceived problem of regional disparity in a sector should possess.

5.58 Such a formulation of the larger problem of development and disparities in it would necessarily involve determination of priorities among sectors simultaneously for development and, in that process, for the removal of regional developmental disparities in them. It will be interesting to see what the implications of a possible choice, of priority sectors, the time-frame and the unit of reckoning disparities, such as the following would be for the then expected Seventh Plan outlay. They are shown in the table below.

Sub-sectors	Time-Frame	Unit	VII Plan Outlay Rs Crore
1. Primary Education	10 years	District (Taluka)	384 (576)
2. Secondary Education	15 years	District	187
3. Hospital Beds	20 years	District	628
4. Other Roads	10 years	District	937
Total		District	2,136
(Total)		Taluka for 1.	(2,328)

These figures have been worked out using the results of Tables 10 to 12. The cost of elimination of disparity at taluka level has been (rather arbitrarily) taken as 1.5 times that at the district level. The above results show that the entire expected total Seventh Plan outlay on the 29 sub-sectors the FFC covered, excluding those of irrigation and water supply, will have to be spent on these priority sub-sectors with the corresponding time-frames. And in the necessary number of the following plans the implicit real growth rate will have to be maintained. That is how the resolution of the problem should be attempted although it might mean little leeway left for the government to do anything more with, what the FFC called, the State Pool for Removal of Specific Backlog. But that would not be necessarily bad. For that may focus the attention of the government on the development of those aspects of economic and social life which it alone can and must bring about. And we have merely discussed the question of plan resources. But there are a host of other supportive actions, training of teachers for example, which must accompany the attempts to spread development. The need to be in consonance with the change in economic policy, that is being brought about in the country, should encourage the government to review its proper and effective, and perhaps limited, role in the field of development and the elimination of disparities in it.

Implementation

5.59 Transparency was another merit of the FFC's work. It laid down clear operational guidelines for the state's planning authorities - the planning department or the planning cells in the development departments - on the allocation of resources to districts so as to bring about a planned reduction of disparities in development in every sector. The present paper suggests a modification of the FFC's approach, procedures and formulae but maintains that quality of transparency intact. Clearly the function of allocation of resources rests with the supra-regional authority as before. The logic of the new approach and the detail of its procedure can be easily followed, and accordingly, the decisions on resource allocation to the appropriate 'regions' taken and implemented by the state's planning authorities on whom finally the responsibility of bringing about a 'balanced' development rests.

ALTERNATIVE METHOD OF DISTRICTWISE ALLOCATION OF RESOURCES

Analysis of Resource Requirements

A.1 Before explaining the alternative method of allocation of resources over the districts, the analysis which led to it is first presented. We discuss the subject with the help of the same example of the indicator of number of primary teachers per lakh population. Table A.1 makes a detailed analysis of the disparity among districts in its respect and works out step by step the resources required to eliminate disparity com-

pletely. As before, districts have been arranged in it by the descending order of indicator values. Its Columns (3) and (4) show the values of the indicator and population (in lakh), respectively. Its Column (5) shows the cumulative total of population 'from below', that is, the results of successive addition of population figures, district by district, from the bottom (Parbhani) to the top (Ratnagiri). Thus, the figure against Parbhani is the same as its population; that against Beed the total population of Parbhani and Beed; that against Nanded the total population of Parbhani, Beed, and Nanded, and so on, with the figure against Ratnagiri obviously being equal to the total population of all districts.

TABLE A.1. ANALYSIS OF DISTRICT LEVEL DISPARITY OF PRIMARY TEACHERS IN MAHARASHTRA

Indicator (Ind) = Number of Primary Teachers Per Lakh Population

Sr No.	District	IND	Population in lakh	Cumulative Population	Additional Resources		Per cent of Column (7) Entries to its First Entry	New Average	Coeff. of Variation (%)
					Stepwise	Cumulative			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Ratnagiri	592.43	21.11	545.39	62,898	124,240	100.00	592.43	0.00
2	Satara	472.46	20.39	524.28	1,083	61,342	49.37	477.11	4.85
3	Raigad	470.31	14.86	503.89	13,258	60,259	48.50	475.12	4.96
4	Sangli	443.20	18.31	489.03	22,595	47,001	37.83	450.81	6.49
5	Kolhapur	395.20	25.06	470.72	775	24,406	19.64	409.38	10.24
6	Ahmednagar	393.46	27.08	445.66	285	23,631	19.02	407.96	10.40
7	Jalgaon	392.78	26.18	418.58	5,023	23,346	18.79	407.44	10.46
8	Amravati	379.98	18.61	392.40	1,690	18,323	14.75	398.23	11.56
9	Solapur	375.46	26.10	373.79	3,004	16,633	13.39	395.13	11.97
10	Wardha	366.82	9.27	347.69	728	13,629	10.97	389.62	12.75
11	Nashik	364.67	29.92	338.42	1,620	12,901	10.38	388.29	12.96
12	Pune	359.42	41.64	308.50	430	11,281	9.08	385.32	13.43
13	Akola	357.81	18.27	266.86	5	10,851	8.73	384.53	13.56
14	Osmanabad	357.79	22.31	248.59	174	10,846	8.73	384.52	13.56
15	Yavatmal	357.02	17.37	226.28	2336	10,672	8.59	384.20	13.62
16	Buldhana	345.84	15.09	208.91	376	8,336	6.71	379.92	14.42
17	Dhule	343.90	20.50	193.82	3,066	7,960	6.41	379.23	14.56
18	Aurangabad	326.21	24.33	173.32	773	4,894	3.94	373.61	15.86
19	Chandrapur	321.02	20.56	148.99	140	4,121	3.32	372.19	16.24
20	Bhandara	319.93	18.38	128.43	902	3,981	3.20	371.93	16.31
21	Nagpur	311.73	25.89	110.05	1597	3,079	2.48	370.28	16.78
22	Thane	292.76	33.52	84.16	366	1,482	1.19	367.35	17.75
23	Nanded	285.54	17.49	50.64	170	1,116	0.90	366.68	18.00
24	Beed	280.41	14.86	33.15	946	946	0.76	366.37	18.12
25	Parbhani	228.71	18.29	18.29	0	0	0.00	364.64	18.99

A.2 The figures in Column (6) show a step by step calculation of additional resources, working again from the bottom to the top. For a particular district, the figure in it shows the additional resources required to raise the indicator values of all lower districts to the value of that particular district, *after all of them* (except the one next below) *had reached the indicator value of the next below district*. For obvious reasons, there is no value in this column against the bottom district of Parbhani. The value 946 against Beed shows the number of additional teachers required to raise Parbhani's indicator value (228.71) to that of Beed (280.41). For,

$(280.41 - 228.71) \times 18.29 = 945.593$ which, when rounded equals 946.

With this done, the indicator values of both Beed and Parbhani will be 280.41 and their total population 33.15, as shown in Column (5). To raise *then* the indicator values of both these districts to the next higher value of 285.54 of Nanded, one needs

$(285.54 - 280.41) \times 33.15 = 170.06$

that is, 170 more teachers, the figure shown in Column (6) against Nanded. Column (6) of the table thus shows this step-by-step calculation of additional number of teachers in each successive step of raising indicator values of all districts. Arithmetically, an entry against a particular district in this column is the product of the difference between its indicator value and that of the district next below, and the cumulative population in Column (5) shown against the latter district.

A.3 Column (7) shows the cumulation of figures in Column (6) from the bottom in a manner similar to the that by which Column (5) was filled. Thus the first figure at its bottom is 946 for Beed, which is repeated from Column (6); the next higher figure: 1,116, is the total of 946 and 170; the next one of 1,482, that of 366 and 1,116, etc., up to the top. The figure in this Column against any district gives the value of total additional number of teachers needed to raise the indicator values of all districts below that particular district to the level of that district. Thus, the figure of 3,079 against

Nagpur shows the total of additional teachers that are required to be appointed in Parbhani, Beed, Nanded and Thane to raise their indicator values to that of Nagpur, that is 311.73. In this column, the first figure against Ratnagiri, of 124,240 gives the total additional number of teachers required to raise the indicator values of *all* districts to the highest value of 592.43 that Ratnagiri has. Recall that the figure of 124,240 was calculated earlier by a simple formula:

(maximum - average)xtotal population

$(592.43 - 364.64) \times 545.39 = 124,240$

It represents the *size* of *total disparity* as also the resources needed to eliminate disparities completely and *instantaneously*. The latter aspect is important, for if it takes time to eliminate disparities, population will grow in the meantime and so will total disparity and additional resources to eliminate disparities completely.

A.4 A mathematically oriented reader will notice that Table A.1 can be alternatively constructed from the top to the bottom. It has sometimes the advantage of saving a number of calculations (see paragraphs A.36 and A.39).

A.5 Column (8) shows the percentage the figures in Column (7) form of this aggregate resources of 124,240 teachers. The next Column (9) shows the new average if the additional resources shown in Column (6) are *allocated appropriately over the districts* and spent in the corresponding districts. Thus, the figure of 370.28 in Column (9) against Nagpur, shows the new average after appointing 3,079 teachers to elevate indicator values of Parbhani, Beed, Nanded and Thane to that of Nagpur (311.73). The last column shows the (weighted) coefficient of variation of districtwise values in this new situation. These two columns show the progressive increase in the overall average and reduction of disparity that takes place as the low indicator value districts are raised to higher levels.

A.6 The main purpose of this table is to provide the basis for the alternative method of resource allocation. It shows the relationship between the additional resources (Column (7)) and the indicator values that will be attained (Column (3)) by

the districts starting from the bottom, if these resources are spent in those districts to raise their indicator value to that level. Recall that Table 1 showed that it will take 12,890 teachers (total backlog) to raise all below-average districts' indicator values to the average (364.64). Line 11 of the Table A.1 for Nashik shows this result, the difference being due to Nashik's indicator value being slightly above the average. We should note that as we go up from the bottom to the top, the population for which indicator value is to be increased itself goes on increasing, and the marginal resources needed to increase the indicator value by one unit correspondingly increases as the indicator value increases. In fact, this marginal cost exactly equals the cumulative population figure shown in Column (5).

A.7 As we saw earlier, the total additional resources required for instantaneous complete removal of disparity total to 124,240 teachers. Only a little larger than 10 per cent of these are needed to bring all below-average districts on par with the initial average, and only 20 per cent to bring the 20 lowest districts to the level of Kolhapur, which has the fifth largest indicator value. After that, the percentage increases fast not only because, as stated above, the population gets cumulated, but also because the differences in indicator values are larger. Even so, only about 50 per cent of resources are needed to raise the 23 low-indicator-value districts to the level of Satara, which has the second highest indicator value. In other words, with just 50 per cent of what would otherwise have been required for total elimination of disparity, the disparity among 24 of the 25 districts (Ratnagiri excluded) can be completely eliminated (after proper allocation of these resources). A table of the type of Table A.1 for any indicator will provide an idea about the economy of resources that may be achieved by moderating the goal of absolute equality to near equality, an issue discussed in the preceding section (see paragraphs 5.40 to 5.42).

Alternative Method of Districtwise Allocation

A.8 Let us ignore the question of population growth and therefore the FFC's allocation of 15 per cent made for 'natural growth', and assume that the additional resources are to be used only for reduction of disparity (or, as FFC called, backlog). Based on Table A.1, I had suggested to the FFC an alternative method of an appropriate allocation of additional resources to reduce disparities.[27] According to that method, for a given size of resources, the figures in Column (7) are to be used to determine the indicator value to which as many (and only those many) lowest indicator value districts as possible could be raised which also decides the districts over which the resources should be distributed. For example, if the resources amount to 6,000 additional teachers, this figure lies between the two figures of 4,894 (for Aurangabad) and 7,960 (for Dhule) in Column (7) with corresponding indicator values of 326.21 and 343.90 in Column (3) of Table A.1. By a simple interpolation for the figure of 6,000 in Column (7), the indicator value will be:

$$326.21 + \frac{(343.90 - 326.21) \times (6000 - 4894)}{(7960 - 4894)} = 332.59$$

and the resources of 6,000 teachers will be used for elevating only the 8 districts of Aurangabad down to Parbhani, and so distributed over these districts that their indicator values will all be equal to 332.59

Comparison with the FFC's Method

A.9 But suppose, to avoid interpolation, the additional resources are 7,960 teachers, the figure in Column (7) against Dhule. By the alternative method I had suggested, they are to be allocated to only the 8 districts of Aurangabad to Parbhani so that their indicator values are all raised to 343.90, that of Dhule. The allocation to any of these districts will be equal to the difference of its indicator value from 343.90 multiplied by its population. Thus, it will be, for

Aurangabad:	$(343.90 - 326.21) \times 24.33 =$	430	[577]
Chandrapur:	$(343.90 - 321.02) \times 20.56 =$	470	[554]
Bhandara:	$(343.90 - 319.93) \times 18.38 =$	441	[507]
Nagpur:	$(343.90 - 311.73) \times 25.89 =$	833	[846]
Thane	$(343.90 - 292.76) \times 33.52 =$	1,714	[1,488]
Nanded	$(343.90 - 285.54) \times 17.49 =$	1,021	[854]
Beed:	$(343.90 - 280.41) \times 14.86 =$	943	[773]
Parbhani	$(343.90 - 228.71) \times 18.29 =$	2,107	[1535]
Total:		7,959	[7,134]

Note: Figures in brackets and in italics give the FFC's allocation.

A.10   But by the FFC's method, this number, (7,960), was to be allocated to all backlog districts, 14 in all, from Pune down to Parbhani, in proportion to their backlog shown in Column (6) of Table 1. This results in the reduction of allocation to the above 8 districts from 7,960 to 7,134, the balance of 826 teachers being spread over six more districts of Pune, Akola, Osmanabad, Yavatmal, Buldhana and Dhule, with higher indicator values. The overall average, after the additional resources are used, remains the same of 379.23 (see Column (9) of Table A.1 against Dhule) under both the methods, but the CV is slightly larger (14.74 per cent) in the results by the FFC's method than under the alternative method. But it is not merely that the 6 additional districts of Pune to Dhule benefit by the FFC's method at the cost of the 8 districts of Aurangabad to Parbhani as a group. But within the latter group also the method adversely affects the interests of the lower indicator value districts. The four higher indicator value districts of Aurangabad to Nagpur benefit at the cost of the lower value districts of Thane to Parbhani (see table above). As a result, instead of indicator values of all the 8 districts, Aurangabad to Parbhani, being raised to 343.90, for Parbhani it is raised to only 312.63, for Beed to 332.44, for Nanded to 334.36, and for Thane to 337.14. The FFC's method thus adversely affects not only the low value districts that, as a group, would have alone benefitted from the alternative method, but also more adversely the districts with the lowest indicator values among that group. **The FFC's method is thus a regressive way of allocation of resources in comparison with the alternative method.**

A.11   When the FFC considered how the resources for removal of backlog should be distributed over the districts, it distinguished two types of situation: (a) when the resources available during the Seventh FYP were larger than those required for the removal of (initial) backlog; and (b) when they were less. In the first case it considered the manner of distribution 'straightforward'. According to it, the part (85 per cent) of resources meant for removal of backlog 'should be distributed in proportion to the backlog of the districts. These *annual* allocations will have been adequate to remove the backlog of these districts *within* the period of the Seventh Plan. As soon as this happens, the position of all districts in the particular sector/sub-sector, etc., should be reviewed' (emphasis added) [FFC, 1984, Para 17.29].

A.12   It was in the case of the second possibility, when the Seventh Plan resources were less than those required to remove the initial backlog, that the FFC alluded to and fully described the alternative method I have developed above and which I had then suggested to it in both the cases. It found that in this alternative 'The allocation of funds when they are not adequate to remove the backlog of all districts with a backlog are made on the principle of maximum justice to those left most behind' [FFC, 1984, Para 17.30], and that 'The proposal has obviously a strong appeal of justice and, for that reason, we have given it much thought and consideration' [FFC, 1984, Para 17.31]. But it concluded by saying.

'......We are sorry to say that, in spite of its merits, we find it not acceptable on practical considerations. It seems to us that, for administrative or operational reasons it is not easy to

confine the development in any field over a period of five years to only a few districts leaving development in the other districts frozen at its present level. The process of removing the backlog of districts lying below the State Average makes this inevitable up to a point. We must distinguish districts with and without a backlog, accelerate development in the districts with a backlog and slow it down in districts without a backlog. This is inevitable if the process of removal of backlog is to be initiated at all. However, *for administrative and operational reasons*, it seems advisable not to restrict the development in any field to fewer districts than is absolutely necessary for the process of removal of backlog.

'Hence, we find the proposal to remove backlog step by step beginning at the bottom so that at each step the most bottom (*sic*) districts are all raised to a certain minimum level attainable within the given resources, *not practicable and desirable*. ......'(emphasis added) [FFC, 1984, Paras 17.31 and 17.32].

A.13 What all this meant was that when resources fell short of the requirement of removal of backlog, it was considered 'practicable and desirable' on administrative and operational considerations to spread the resources over all backlog districts at the cost, in some sense, of most backward districts, when justice required that it should not be done. **By the FFC's method, every backlog district thus benefits at the cost of every backlog district below it and loses to every backlog district above it in the indicator value.**

A.14 The FFC gave four reasons for rejecting the alternative method: Administrative and operational reasons, and lack of practicability and desirability. Little can be said about desirability or its absence; it is purely a value judgement. But the other three appear to be not well-thought out. For suppose, the resources for removal of backlog were 12,890 teachers, the exact size of the total initial backlog (Table 1), so that the indicator values of all backlog districts can be raised by the FFC's method to the initial average of 364.64 with the number of teachers allocated to every backlog

district being equal to its size of backlog. The alternative method will give in this situation precisely the same result by interpolation in Table A.1 and the allocation to the backlog districts will also be the same as by the FFC's method. In both, the allocation to Parbhani district will be 2,486 teachers. But if the resources for removal of backlog are less than backlog and equal 7,960 teachers, the allocation to Parbhani, as we saw before, will be 2,107 teachers by the alternative method, and 1,535 by the FFC's method. The FFC meant to say that for administrative and operational reasons it will not be practicable to appoint 2,107 teachers in Parbhani (in one single FYP) if resources for backlog removal were 7,960 teachers, but the same reasons do not stand in the way of appointing a much larger number of 2,486 teachers in that district if the resources for removal of backlog were 12,890 teachers! Administrative and operational reasons and practicability, one can understand, have direct relevance to how large a number of teachers can be appointed in Parbhani district in a particular plan. But it can hardly have any relevance to the total resources from which that number has been allocated to Parbhani. Therefore, to make the possession of the qualities of administrative and operational significance and practicability dependent upon how large the total size of resource from which Parbhani's allocation was made is logically mysterious. And what has been said above about Parbhani equally well applies to the other seven districts of Aurangabad to Beed in our example of 7,960 teachers. The FFC's thus rejected the alternative method because it was not 'desirable' for use.

A.15 The FFC's reasoning for rejection of the alternative method was thus questionable, but the point was not belaboured at that time. It was thought that because the size of the initial backlog, as illustrated above, could be a small part of the size of total disparity, *only for an initially short period*, till that backlog was removed, *the most lagging backlog districts will have to suffer*, for practical, desirable, administrative and operational considerations to put at advantage the other not-so-lagging backlog districts. But that

impression was wrong. For, as shown in paragraph A.10 and as will be further shown below, the FFC's method of allocation for reduction of backlog will always treat the most lagging districts unfairly.

A.16   The more important point, however, is that an FYP's resources will have to be much larger than backlog at some stage if disparity is to be eliminated. It is the first type of case described in paragraph A.10 which will then arise. The FFC's solution in that case was *not to plan for a five year period but year by year*; this is implicit in its reference to 'annual' allocations, in its paragraph 17.29, quoted above. And, if the resources for a scheme even for one year were larger than the backlog, what was the FFC's suggestion? It was to combine that scheme with other schemes within the same sub-sector, as it did, for Annual Plan 1983-84, in the case of Vocational Courses, Rural Water Supply with dug/bore wells, and Land Development in Non-CADA area [FFC, 1984, Para 17.34]. But the first device was unnecessary and the second inconsistent with the FFC's approach.

A.17   Let us take the second first. It means bunching of schemes and, therefore, permits diversion of resources from one to another within the bunch. This is inconsistent with the principle underlying the FFC's approach to treat every development activity separately. And it was unnecessary for, even if annual plan resources are larger than what are required to remove backlog, the indicator values can be raised to a certain level above the average for all districts below that level. There is no intrinsic meaning to the average in defining backlog or backwardness. It is a convenient starting point. But there is no reason, when resources are large enough, to continue to insist that every time, first, only those below the average should be raised only to the level of average, and then the process be repeated (which has problems too, as shortly explained). In this case, if at one go, districts below the average, and some above average too, can be raised to a high enough level which resources permit, and a method is available for doing that - a method based on the very strategy of the FFC to lift the

bottom - it is incomprehensible why the FFC's formula for 'backlog' removal, which is riveted to the average, should be pursued.

A.18   When the five year plan resources are larger than those required for removal of backlog, a straightforward use of the alternative method would give the level (above the average) that could be reached with the available resources by all districts with indicator value below that level. Splitting the larger five year plan outlay and adopting the FFC's procedure will continue the unfair treatment to more lagging districts apart from introducing stages of cumbersome calculating operations. This is how it happens.

A.19   We disregard the population growth to simplify the method and continue with the example of primary teachers. The initial backlog was 12,890 teachers. When this is removed, the indicator values of the 11 initially 'backlog' districts, Pune down to Parbhani, with total population of 308.50 lakh, (Table A.1, Column (5), entry against Pune), will be equal to the initial average 364.64 and the new average will be (refer Table 1):

$$(198867 + 12890 = 211757)/545.39 = 388.27$$

In the second cycle, four more districts: Amravati, Solapur, Wardha, and Nashik, will also become 'backlog' districts in addition to the first set of 11. The new backlog will be, for

Amravati	(388.27 - 379.98) x 18.61	=	154
Solapur	(388.27 - 375.46) x 26.10	=	334
Wardha	(388.27 - 366.82) x 9.27	=	199
Nashik	(388.27 - 364.67) x 29.92	=	706
Pune to Parbhani	(388.27 - 364.64) x308.50	=	7,290
Total			= 8,683

The new average at the end of the *second* cycle will be:

$$(211757 + 8683 = 220440)/545.39 = 404.19$$

In the *third* cycle, three more districts, Kolhapur, Ahmednagar and Jalgaon, become new 'backlog'

districts in addition to the 15, with total population of 392.40 lakh, up to the end of the second cycle. The new backlog will be

Kolhapur	(404.19 - 395.20) x 25.06	= 225
Ahmednagar	(404.19 - 393.46) x 27.08	= 291
Jalgaon	(404.19 - 392.78) x 26.18	= 299
Amravati to Parb-hani	(404.19 - 388.27) x 392.40	= 6,247
Total		= 7,062

A.20   The implications of the FFC's recommended procedure is as follows: Suppose the resources available are 16,000 teachers. By the alternative procedure we get in one step by interpolation in Table A.1 what should be done. In Column (7) of that table, the figure 16,000 lies between those for Wardha and Solapur. The interpolated value of the indicator is easily seen to be:

$$366.82 + \frac{(375.46 - 366.82) \times (16000 - 13629)}{(16633 - 13629)} = 373.64$$

Thus with 16,000 additional teachers, the indicator values of all districts from Wardha down to Parbhani can be increased to 373.64, and the allocation to any one of them will equal the deficit to be made good in that district to raise its indicator value to 373.64. Thus for Parbhani, it will be:

(373.64 - 228.71)x18.29 = 2,651 teachers

A.21   But by the FFC's procedure, we remove in the *first* cycle, the initial 'backlog' by allocating 12,890 teachers to all districts that have initially a backlog (Pune to Parbhani). That will raise their indicator values to 364.64 and the overall average to 388.27. Then, in the second cycle, as seen above, four more districts, Amravati, Solapur, Wardha and Nashik, having indicator values less than the new average, will also become the backlog districts in addition to the first set of 11 districts. The balance of resources of 3,110 (= 16000 - 12890) teachers will be then allocated to

these four districts in addition to the 11 of the first set in proportion to their backlog shown in paragraph A.16 with the following results:

District	Allocation	New Indicator
1. Amaravati	55	382.94
2. Solapur	120	380.06
3. Wardha	71	374.48
4. Nashik	253	373.13
5. Pune to Parbhani	2,611	373.10

In effect, Amravati, Solapur and Wardha will benefit at the cost of Nashik and the 11 first-set districts, raising the indicator values of the latter 12 districts to a value less than 373.64. Clearly, there is no justification for depriving 13 districts of their gains for any of the reasons the FFC gave in rejecting the alternative method when resources were less than the backlog. The FFC's method should not therefore be followed when resources exceed the initial backlog and the alternative method should be adopted for the principle of justice on which it is based which the FFC also acknowledged and appreciated. And if, in this particular example, it is argued that the extent by which the indicator values for the 12 districts, Nashik to Parbhani, is depressed is considered negligible, one must point out *first* that the increases in the indicator values of Amravati, Solapur and Wardha are quite sizable contributing to an increase in disparity. *Second* the negligible difference would mean that the two methods do not make much difference, and there is no point in the cumbersome calculations the FFC's procedure entails in contrast to the one-step calculation of the alternative method.

A.22   Further, such cumbersome calculations will have to be unnecessarily performed for a number of times because of a subtle statistical point. If one were to continuously split a quantity of resources sufficiently larger than backlog, so that in each cycle the component considered in it equals the total backlog at that stage in order to follow the FFC's procedure, the number of such cycles can become very large. This will happen because, the successive total backlog figures exhibit a *diminishing trend*, and the total backlog will not become zero at any stage so that the

operation will terminate. The table below shows the total backlog that will emerge in each primary teachers.

successive cycle of calculation in the example of primary teachers.

Cycle Number	Backlog	Cumulative Backlog	Cycle Number	Backlog	Cumulative Backlog
1	12,890	12,890	11	2,582	60,717
2	8,684	21,574	20	1,792	79,716
3	7,060	28,634	25	1,475	87,692
4	6,097	34,731	30	1,206	94,237
5	5,260	39,991	35	990	99,610
6	4,541	44,532	40	814	104,023
7	3,976	48,508	45	666	107,642
8	3,566	52,074	50	546	110,609
9	3,195	55,269	55	451	113,051
10	2,866	58,135	60	371	115,057

This shows that by the FFC's method, up to the elimination of 1/4 th of total disparity of 124,240, that is, when the resources to be applied in the first Plan are about 30,000 teachers, one needs to make *four* cycles of calculation; up to 1/3 rd of the total disparity, that is 40,000, teachers, *six* cycles of calculation; and 1/2 of the total disparity, that is, 62,000 teachers, 11 cycles of calculation. One should also note that this is not something peculiar about the specific example we have considered. The FFC's procedure thus involves unnecessary arithmetical operations when the alternative method, with its foundations based on fairness and justice, gives directly, in one step, the districtwise allocation of resources.

A.23   Finally, a subtle mathematical point. It should be clear from the examples given so far that **the FFC's method is non-additive**, that is, it produces different results when a given amount of resosurce is distributed in parts in different ways. For example, in our example, if the resources of 12,890 teachers are applied in one single dose, the indicator values of all backlog districts, and therefore of Parbhani, will be raised to 364.64. But if the same resources are applied in two equal doses of 6,445 teachers at a time, the results change completely and Parbhani's indicator value at the end becomes only 345.38. And, if the same resources are applied in three equal doses of 4,297 teachers at a time, Parbhani's indicator value, at the end, is raised to only 341.39. Not only are the three results different but Parbhani also suffers when the resources are split up into two or more components. This is a serious

defect of the FFC's method. The alternative method does not suffer from this defect and the final result is the same for a given total amount of resource and does not depend upon the size, number, and sequence of the doses in which that resource is applied.

A.24   The conclusion, therefore, is that the alternative method based on distributing resources to the most needy districts is a direct method of allocation of resources earmarked for reduction of disparity. When these resources are less than the FFC-defined backlog, and if only a few districts are likely to be covered by the alternative method, and if the interest in spreading the resources wider is an overwhelming political consideration, the FFC's method of districtwise allocation may be used. But when these resources, at any stage, are larger than what the complete elimination of backlog at that stage requires, there is no justification for use of the FFC's method on any of the grounds the FFC adduced for rejecting the alternative method. The alternative method should be adopted because of its fairness and justness and because it precisely ensures, with the resources available, the lifting up of the most number of the most lagging districts in consistence with the FFC's strategy. Because after some stage in the process of elimination of disparity available resources will have to be larger than what the FFC-defined backlog at that stage will need for its removal, sooner or later, recourse to the alternative method will become necessary if disparity were to be eliminated.

Districtwise Allocation by Alternative Method

A.25   I shall now illustrate the full procedure of how total resources, devoted to a sub-sector so as to eliminate disparity in it in a given time-frame, should be allocated over the districts, and also over the time-frame. We continue with the same example of primary teachers and assume that the target is to eliminate disparity completely in a period of 20 years or *four* FYPs. As was seen

in Section IV, Table 3A, the additional (real) resources in terms of primary teachers needed for the purpose were 321,147 teachers, of which 115,870 were needed on account of population growth and 205,277 for elimination of disparity at the end of the 20th year. Table A.2 shows the districtwise allocation of these numbers.The calculations in the table are straightforward and use the results of equation (10) of the first Mathematical note. But they are easily explained.

TABLE A.2. TOTAL ALLOCATION TO DISTRICTS OVER *FOUR* FYPS FOR ELIMINATION OF DISPARITIES

Indicator: Number of Primary Teachers Per Lakh Population

Sr. No.	District	1981 Population (lakh)	Five year Growth Rate %	Indicator	Resources* for Population Growth	Disparity Removal	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Ratnagiri	21.11	5.027	592.43	2,711	0	2,711
2	Satara	20.39	9.640	472.46	4,287	3,535	7,822
3	Raigad	14.86	10.535	470.31	3,444	2,709	6,153
4	Sangli	18.31	9.836	443.20	3,695	3,977	7,672
5	Kolhapur	25.06	10.141	395.20	4,671	7,274	11,945
6	Ahmednagar	27.08	11.606	393.46	5,876	8,360	14,236
7	Jalgaon	26.18	10.349	392.78	4,964	7,750	12,714
8	Amravati	18.61	8.729	379.98	2,812	5,526	8,338
9	Solapur	26.10	11.669	375.46	5,439	8,806	14,245
10	Wardha	9.27	7.285	366.82	1,105	2,771	3,876
11	Nashik	29.92	13.450	364.67	7,164	11,289	18,453
12	Pune	41.64	15.274	359.42	11,460	17,132	28,592
13	Akola	18.27	10.082	357.81	3,062	6,295	9,357
14	Osmanabad	22.31	12.723	357.79	4,905	8,452	13,357
15	Yavatmal	17.37	9.348	357.02	2,665	5,846	8,511
16	Buldhana	15.09	11.794	345.84	2,933	5,812	8,745
17	Dhule	20.50	11.225	343.90	3,739	7,797	11,536
18	Aurangabad	24.33	16.861	326.21	6,865	12,080	18,945
19	Chandrapur	20.56	11.591	321.02	3,634	8,653	12,287
20	Bhandara	18.38	7.093	319.93	1,854	6,588	8,442
21	Nagpur	25.89	12.677	311.73	4,939	11,714	16,653
22	Thane	33.52	25.136	292.76	14,249	24,631	38,880
23	Nanded	17.49	15.421	285.54	3,869	9,526	13,395
24	Beed	14.86	13.556	280.41	2,762	7,710	10,472
25	Parbhani	18.29	13.512	228.71	2,762	11,045	13,807
	TOTAL	545.39			115,866	205,278	321,144

* Number of primary teachers

A.26   Column (4) gives the growth rate in population per 5-year period. Column (6) shows the total increase in teachers required due to population growth. Thus for Ratnagiri, in 20 years' time, its population will increase at the rate of 5.027 per cent per 5-year period by 21.68 per cent. It had initially 12,506 teachers (Column (3) multiplied by Column (5)), and this number has to grow by 21.68 per cent, that is by 2,711, the figure in Column (6), if its indicator value is to be maintained. The total of figures in Column (6) thus calculated is 115,866 which differs from 115,870 due to rounding of figures.

A.27   The figures in Column (7) give the second component of additional resources, that is those required for elimination of disparity when all indicator values will be equal to 592.43, Ratnagiri's indicator value. Consider Parbhani with the growth rate of 13.512 per cent per 5-year period in its population which at the end of the 20th year will be:

$$18.29 \times (1.13512)^4 = 30.366 \text{ lakh}$$

At that stage, the additional number of teachers it will need to make its indicator value (228.71) equal to 592.43 will be

$$(592.43 - 228.71) \times 30.366 = 11,045$$

the figure shown in Column (7) against it. The total of figures in Column (7) is 205,278 which differs from 205,277 due to rounding.

A.28   Column (8) shows the total of figures in Columns (6) and (7) calculated for every district in the above manner and shows the total resources needed by a district to make its indicator value equal to 592.43 at the end of the 20th year, or of the fourth FYP, after allowing for the growth in population that would have taken place during this period. The total for all districts in Column (8) is 321,144 which differs from 321,147 due to rounding.

A.29   Note that 36 per cent of total resources are needed for population growth. But this is on the assumption that disparity removal takes place in the last year, that is all resources for that purpose will be applied in the last year. In practice, in every plan, additional resources will be devoted for disparity reduction, as a result of which indicator values will increase (for the low-value districts). This in turn will mean that in the next plan, resources required for population growth will form a higher percentage of the total resources than in the first plan, and this trend will continue. The division shown in Table A.2 for population growth and disparity removal is merely for the analysis of the total resources into two components according to two causes. But operationally, both population growth and disparity reduction will take place simultaneously.

Allocations in Successive FYPs

A.30   In practice, the allocations will be made for each FYP. As stated in paragraph 5.26, the (real) resources devoted to the sub-sector in the four plans will have to be 54.013; 68,682; 87,336; and 111,057 primary teachers, respectively, which total to 321,088 (which differs from 321,147 due to cumulative effects of rounding of numbers).

A.31   Let us start with the *first* plan. We need to make the calculation of allocation over districts in the following steps:

i) allocation over districts due to population growth,

ii) the balance of resources for disparity reduction, and

iii) determination of the indicator level that can be reached with this
balance by using the alternative method of allocation, and

iv) work out for every district the resources needed to reach this
level of indicator value.

Table A.3.1 shows how the calculations are to be made. Its Columns (3) and (4) show the population (in lakh) at the beginning and at the end of the first plan using the districtwise growth rates shown in Table A.2. Column (5) shows the values

of the indicator at the beginning of the first plan, which, because it is the first plan, are the initial indicator values. Column (6) gives the figures of additional number of teachers needed on account of population growth to maintain the indicator values as at the beginning of the plan and equal the growth in population (Column (4) *minus*

Column (3)) *multiplied* by the indicator value. The total over all districts is 23,731 teachers. With total resources in the plan of 54,013 teachers, this leaves a balance of 30,282 teachers for reduction of disparity. The districtwise allocation of this balance is done by the alternative method of allocation which needs preparation of Table A.4.1

TABLE A.3.1. ALLOCATION OF ADDITIONAL RESOURCES TO DISTRICTS IN PLAN NO. 1

| Sr.No. | District | Population | | Indicator at the Beginning | Resources* for | | |
		Beginning	End		Population Growth	Disparity	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Ratnagiri	21.11	22.17	592.43	629	0	629
2	Satara	20.39	22.36	472.46	929	0	929
3	Raigad	14.86	16.43	470.31	736	0	736
4	Sangli	18.31	20.11	443.20	798	0	798
5	Kolhapur	25.06	27.60	395.20	1,004	121	1,125
6	Ahmednagar	27.08	30.22	393.46	1,237	185	1,422
7	Jalgaon	26.18	28.89	392.78	1,064	197	1,261
8	Amravati	18.61	20.23	379.98	617	397	1,014
9	Solapur	26.10	29.15	375.46	1,144	703	1,847
10	Wardha	9.27	9.95	366.82	248	326	574
11	Nashik	29.92	33.94	364.67	1,468	1,185	2,653
12	Pune	41.64	48.00	359.42	2,286	1,928	4,214
13	Akola	18.27	20.11	357.81	659	840	1,499
14	Osmanabad	22.31	25.15	357.79	1,016	1,051	2,067
15	Yavatmal	17.37	18.99	357.02	580	809	1,389
16	Buldhana	15.09	16.87	345.84	615	907	1,522
17	Dhule	20.50	22.80	343.90	791	1,270	2,061
18	Aurangabad	24.33	28.43	326.21	1,338	2,086	3,424
19	Chandrapur	20.56	22.94	321.02	765	1,803	2,568
20	Bhandara	18.38	19.68	319.93	417	1,568	1,985
21	Nagpur	25.89	29.17	311.73	1,023	2,563	3,586
22	Thane	33.52	41.95	292.76	2,467	4,481	6,948
23	Nanded	17.49	20.19	285.54	770	2,302	3,072
24	Beed	14.86	16.87	280.41	565	2,011	2,576
25	Parbhani	18.29	20.76	228.71	565	3,548	4,113
		545.39	612.97		23,731	30,281	54,012

Notes: * Number of primary teachers.
Col.(6) = [Col.(4) - Col.(3)] x Col.(5)
Col.(7) = [399.59 - Col.(5)] x Col.(4)

A.32 This table is exactly of the same type as of Table A.1, the only difference being that it uses population figures as at the end of the first plan. The figure of 30,382 lies between the cumulatives in the Column (7) for Kolhapur and Sangli, with indicator values of 395.20 and 443.20, respectively, and shows that the indicator value that can be attained with the resources of 30,282 teachers will be higher than that (395.20) of Kolhapur but

less than that (443.20) of Sangli. By interpolation, explained at the foot of Table A.4.1, it will be found to be 399.59. Thus with the addition of 30,282 teachers, the indicator values of all districts from Kolhapur down to Parbhani can be raised to 399.59.

A.33 With this value known, we can now fill Column (7) of Table A.3.1 to show the number of teachers in every district, from Kolhapur down

to Parbhani, needed to raise its indicator value to 399.59, by taking the difference of its indicator value from 399.59 and multiplying it by *the population at the end of the first plan.* The total of all these values: 30,281 differs from 30,282 due to rounding of numbers.

A.34   With Columns (6) and (7) of Table A.3.1 thus worked out, their total is shown in its Column (8), which gives for every district the allocation of total resources in the first plan. Ratnagiri, Satara, Raigad and Sangli, which do not get any resources for disparity reduction, maintain their

initial values of the indicator, and all other districts have their indicator values raised to 399.59 at the end of the first plan.

A.35   This gives the position at the beginning of the *second* plan, and the whole calculation is to be carried out in an exactly similar manner using the new indicator values and the figures of population as at the end of the second plan. The procedure is thus to be sequentially followed for the third and the fourth plans. The results of these calculations are shown in the set of Tables A.3.2 and A.4.2; A.3.3 and A.4.3; and A.3.4 and A.4.4

TABLE A.4.1. ANALYSIS OF DISTRICT LEVEL DISPARITY OF PRIMARY TEACHERS IN MAHARASHTRA FOR PLAN NO. 1

Ind = (Ind) Number of Primary Teachers Per Lakh Population

Sr.No.	District	Population at the End	Indicator at the Beginning	Cumulative Population	Additional Resources*	
					Stepwise	Cumulative
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Ratnagiri	22.17	592.43	612.97	70,878	140,542
2	Satara	22.36	472.46	590.80	1,222	69,664
3	Raigad	16.43	470.31	568.44	14,965	68,442
4	Sangli	20.11	443.20	552.02	25,532	53,477
5	Kolhapur	27.60	395.20	531.91	877	27,945
6	Ahmednagar	30.22	393.46	504.31	322	27,068
7	Jalgaon	28.89	392.78	474.08	5,698	26,746
8	Amravati	20.23	379.98	445.19	1,921	21,048
9	Solapur	29.15	375.46	424.96	3,420	19,127
10	Wardha	9.95	366.82	395.81	830	15,707
11	Nashik	33.94	364.67	385.87	1,848	14,877
12	Pune	48.00	359.42	351.92	489	13,029
13	Akola	20.11	357.81	303.92	6	12,540
14	Osmanabad	25.15	357.79	283.81	199	12,534
15	Yavatmal	18.99	357.02	258.66	2,680	12,335
16	Buldhana	16.87	345.84	239.67	432	9,655
17	Dhule	22.80	343.90	222.80	3,538	9,223
18	Aurangabad	28.43	326.21	200.00	890	5,685
19	Chandrapur	22.94	321.02	171.57	162	4,795
20	Bhandara	19.68	319.93	148.62	1,057	4,633
21	Nagpur	29.17	311.73	128.94	1,893	3,576
22	Thane	41.95	292.76	99.77	417	1,683
23	Nanded	20.19	285.54	57.82	193	1,266
24	Beed	16.87	280.41	37.63	1,073	1,073
25	Parbhani	20.76	228.71	20.76	0	0

Notes: 1. * Number of primary teachers.
2. The Table is used in the following manner:
Total Resources for the first plan : 54,013 teachers minus resources needed for population growth : 23,731 (Table A.3.1, Col.(6) total) gives resources available for disparity reduction = 30,282.
3. Interpolation in Col.(7) gives the corresponding indicator value in Col.(3) to be:
395.20+ (443.30 - 395.20) x (30,282 - 27,945)/(53,477-27,945) = 399.59

TABLE A.3.2. ALLOCATION OF ADDITIONAL RESOURCES TO DISTRICTS IN PLAN: NO. 2

District		Population		Indicator at the Beginning	Resources* for		
		Beginning	End		Population Growth	Disparity	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Ratnagiri	22.17	23.29	592.43	660	0	660
2	Satara	22.36	24.51	472.46	1,018	0	1,018
3	Raigad	16.43	18.16	470.31	814	0	814
4	Sangli	20.11	22.09	443.20	877	394	1,271
5	Kolhapur	27.60	30.40	399.59	1,118	1,867	2,985
6	Ahmednagar	30.22	33.73	399.59	1,402	2,072	3,474
7	Jalgaon	28.89	31.88	399.59	1,195	1,958	3,153
8	Amravati	20.23	22.00	399.59	706	1,352	2,058
9	Solapur	29.15	32.55	399.59	1,359	1,999	3,358
10	Wardha	9.95	10.67	399.59	290	655	945
11	Nashik	33.94	38.51	399.59	1,824	2,366	4,190
12	Pune	48.00	55.33	399.59	2,930	3,399	6,329
13	Akola	20.11	22.14	399.59	810	1,360	2,170
14	Osmanabad	25.15	28.35	399.59	1,279	1,741	3,020
15	Yavatmal	18.99	20.77	399.59	709	1,276	1,985
16	Buldhana	16.87	18.86	399.59	795	1,159	1,954
17	Dhule	22.80	25.36	399.59	1,023	1,558	2,581
18	Aurangabad	28.43	33.23	399.59	1,916	2,041	3,957
19	Chandrapur	22.94	25.60	399.59	1,063	1,573	2,636
20	Bhandara	19.68	21.08	399.59	558	1,295	1,853
21	Nagpur	29.17	32.87	399.59	1,478	2,019	3,497
22	Thane	41.95	52.49	399.59	4,213	3,224	7,437
23	Nanded	20.19	23.30	399.59	1,244	1,431	2,675
24	Beed	16.87	19.16	399.59	914	1,177	2,091
25	Parbhani	20.76	23.57	399.59	1,121	1,448	2,569
		613.97	691.88		31,316	37,364	68,680

Notes: 1. * Number of primary teachers,
2. Col.(7) = [461.02 - Col.(5)] x Col.(4)

TABLE A.4.2. ANALYSIS OF DISTRICT LEVEL DISPARITY OF PRIMARY TEACHERS IN MAHARASHTRA FOR PLAN NO. 2

Ind = (Ind) Number of Primary Teachers Per Lakh Population

Sr.No.	District	Population at the End	Indicator at the Beginning	Cumulative Population	Additional Resources*	
					Stepwise	Cumulative
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Ratnagiri	23.29	592.43	689.88	79,971	124,512
2	Satara	24.51	472.46	666.59	1,380	44,541
3	Raigad	18.16	470.31	642.08	16,915	43,161
4	Sangli	22.09	443.20	623.93	26,246	26,246
5	Kolhapur to Parbhani	601.84	399.59	601.84	0	0

Notes: 1. * Number of primary teachers.
2. The Table is used in the following manner:
Total Resources for the second plan : 68,682 teachers minus resources needed for population growth : 31,316 (Table A.3.2, Col.(6) total) gives resources available for disparity reduction = 37,366.
3. Interpolation in Col.(7) gives the corresponding indicator value in Col.(3) to be:
443.20+ (470.31 - 443.20) x (37,366 - 26,246)/(43,161 - 26,246) = 461.02.

TABLE A.3.3. ALLOCATION OF ADDITIONAL RESOURCES TO DISTRICTS IN PLAN NO. 3

	District	Population		Indicator at the Beginning	Resources* for		
		Beginning	End		Population Growth	Disparity	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Ratnagiri	23.29	24.46	592.43	693	0	693
2	Satara	24.51	26.87	472.46	1,116	1,377	2,493
3	Raigad	18.16	20.07	470.31	900	1,071	1,971
4	Sangli	22.09	24.26	461.02	1,002	1,521	2,523
5	Kolhapur	30.40	33.48	461.02	1,421	2,099	3,520
6	Ahmednagar	33.73	37.65	461.02	1,805	2,360	4,165
7	Jalgaon	31.88	35.18	461.02	1,521	2,205	3,726
8	Amravati	22.00	23.92	461.02	885	1,499	2,384
9	Solapur	32.55	36.34	461.02	1,751	2,278	4,029
10	Wardha	10.67	11.45	461.02	358	718	1,076
11	Nashik	38.51	43.69	461.02	2,388	2,738	5,126
12	Pune	55.33	63.78	461.02	3,896	3,998	7,894
13	Akola	22.14	24.37	461.02	1,029	1,528	2,557
14	Osmanabad	28.35	31.95	461.02	1,663	2,003	3,666
15	Yavatmal	20.77	22.71	461.02	895	1,424	2,319
16	Buldhana	18.86	21.08	461.02	1,025	1,322	2,347
17	Dhule	25.36	28.21	461.02	1,312	1,768	3,080
18	Aurangabad	33.23	38.83	461.02	2,583	2,434	5,017
19	Chandrapur	25.60	28.57	461.02	1,368	1,791	3,159
20	Bhandara	21.08	22.58	461.02	689	1,415	2,104
21	Nagpur	32.87	37.04	461.02	1,921	2,321	4,242
22	Thane	52.49	65.68	461.02	6,083	4,117	10,200
23	Nanded	23.30	26.89	461.02	1,657	1,686	3,343
24	Beed	19.16	21.76	461.02	1,198	1,364	2,562
25	Parbhani	23.57	26.75	461.02	1,468	1,677	3,145
		691.88	780.58		40,627	46,714	87,341

Notes: 1. * Number of primary teachers.
2. Col.(7) = [523.70 - Col.(5)] x Col.(4).

TABLE A.4.3. ANALYSIS OF DISTRICT LEVEL DISPARITY OF PRIMARY TEACHERS IN MAHARASHTRA FOR PLAN NO. 3

Ind = (Ind) Number of Primary Teachers Per Lakh Population

Sr.No.	District	Population at the End	Indicator at the Beginning	Cumulative Population	Additional Resources*	
					Stepwise	Cumulative
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Ratnagiri	24.46	592.43	777.58	90352	98473
2	Satara	26.87	472.46	753.12	1561	8121
3	Raigad	20.07	470.31	726.25	6560	6560
4	Sangli to Parbhani	706.18	461.02	706.18	0	0

Notes: 1. * Number of primary teachers.
2. The Table is used in the following manner:
Total Resources for the third plan : 87,336 minus resources needed for population growth : 40,627 gives resources available for disparity reduction = 46,709.
3. Interpolation in Col.(7) gives the corresponding indicator value in Col.(3) to be:
472.46+ (592.43 - 472.46) x (46,709 - 8,121)/(98,473 - 8,121) = 523.70.

TABLE A.3.4. ALLOCATION OF ADDITIONAL RESOURCES TO DISTRICTS IN PLAN NO. 4

	District	Population		Indicator at the Beginning	Resources* for		
		Beginning	End		Population Growth	Disparity	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Ratnagiri	24.46	25.69	592.43	728	0	728
2	Satara	26.87	29.46	523.70	1,357	2,025	3,382
3	Raigad	20.07	22.18	523.70	1,107	1,525	2,632
4	Sangli	24.26	26.65	523.70	1,250	1,832	3,082
5	Kolhapur	33.48	36.88	523.70	1,778	2,535	4,313
6	Ahmednagar	37.65	42.01	523.70	2,288	2,888	5,176
7	Jalgaon	35.18	38.82	523.70	1,907	2,668	4,575
8	Amravati	23.92	26.01	523.70	1,094	1,788	2,882
9	Solapur	36.34	40.59	523.70	2,221	2,789	5,010
10	Wardha	11.45	12.28	523.70	437	844	1,281
11	Nashik	43.69	49.57	523.70	3,077	3,407	6,484
12	Pune	63.78	73.53	523.70	5,102	5,053	10,155
13	Akola	24.37	26.83	523.70	1,287	1,844	3,131
14	Osmanabad	31.95	36.02	523.70	2,129	2,476	4,605
15	Yavatmal	22.71	24.83	523.70	1,112	1,707	2,819
16	Buldhana	21.08	23.57	523.70	1,302	1,620	2,922
17	Dhule	28.21	31.37	523.70	1,658	2,156	3,814
18	Aurangabad	38.83	45.38	523.70	3,429	3,119	6,548
19	Chandrapur	28.57	31.88	523.70	1,734	2,191	3,925
20	Bhandara	22.58	24.18	523.70	839	1,662	2,501
21	Nagpur	37.04	41.73	523.70	2,459	2,868	5,327
22	Thane	65.68	82.19	523.70	8,646	5,649	14,295
23	Nanded	26.89	31.04	523.70	2,172	2,133	4,305
24	Beed	21.76	24.71	523.70	1,545	1,698	3,243
25	Parbhani	26.75	30.37	523.70	1,893	2,087	3,980
		780.58	877.76		52,551	58,564	111,115

Notes: * Number of primary teachers.
Col.(7) = [592.43 - Col.(5)] x Col.(4).

TABLE A.4.4. ANALYSIS OF DISTRICT LEVEL DISPARITY OF PRIMARY TEACHERS IN MAHARASHTRA FOR PLAN NO. 4

Ind = (Ind) Number of Primary Teachers Per Lakh Population

Sr.No.	District	Population at the End	Indicator at the Beginning	Cumulative Population	Additional Resources*	
					Stepwise	Cumulative
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Ratnagiri	25.69	592.43	877.76	58,563	58,563
2	Satara to Parbhani	852.07	523.70	852.07	0	0

Notes: 1. * Number of primary teachers.
2. The Table is used in the following manner: Total Resources for the *third* plan : 1,11,057 *minus* resources needed for population growth : 52,551 gives resources available for disparity reduction = 58,506 which differs from Column (7) due to rounding.
The resulting indicator value should be taken as 592.43.

A.36   A word needs to be said about tables of A.4 series. It is not necessary that the calculations for Table A.4.1 be done completely or by working from the bottom (Parbhani) upwards. The results in its Columns (5), (6), and (7) can also be worked out by starting from the top. Figures in Columns (3) and (4) are copied from Columns (4) and (5) of Table A.3.1. The first figure in Column (5) of Table A.4.1 is the total population.

A.37   Now, from Table A.3.1 it is seen that the total additional number of teachers due to population growth is 23,731 which when added to the initial stock of 198,867 gives a total of 222,598 teachers, and this divided by the total population of 612.97 (lakh) gives the average indicator value to be 363.15. (Note the slight decline in the average from its initial value of 364.64 even though all districtwise initial indicator values have remained the same. It takes place because of higher population growth rate of low-indicator-value districts.) Given the average, the total number of teachers needed to increase all indicator values to 592.43 is obtained by

$$(592.43 - 363.15) \times 612.97 = 140,542 \text{ teachers}$$

the first figure in Column (7) against Ratnagiri.

A.38   To work out the first figure in Column (6), we then take the next below district of Satara. Ratnagiri's population is 22.17 lakhs, which when deducted from the total population of 612.97 lakhs gives 590.80 lakhs as the total population of all districts from Satara down to Parbhani, the second figure, for Satara, in Column (5). Satara's indicator value is 472.46 which all these 24 districts are assumed to have reached. For all of them to reach Ratnagiri's indicator value of 592.43, one needs

$$(592.43 - 472.46) \times 590.80 = 70,878 \text{ teachers}$$

the first figure in Column (6).

A.39   The second figure in Column (7) is obtained by subtracting the first figure in Column (6) from the first figure in Column (7), that is

$$140,542 - 70,878 = 69,664$$

Having obtained this figure in Column (7) against Satara, we obtain that in Column (6) by going down to the next district of Raigad and repeating the process described in the preceding paragraph. In this way we need to go down only up to Kolhapur, in four steps, till we find two numbers in Column (7) between which the figure of 30,282, the resources available for disparity reduction, lies and then by interpolation (described before) find the necessary value of the indicator. Thus, a large (in this case 80 per cent) part of the calculation procedure can be saved by choosing appropriately the end from which to begin calculations in Tables of series A.4.

A.40   Because a large number of districts are raised to a common indicator value at the end of first plan, the calculations for Tables A.4.2 and A.4.3, and the tables themselves are reduced to five lines of calculations and it will be advantageous in their case to start from the bottom. There is no calculation of interpolated value involved in the last two-line Table A.4.4

A.41   As a check on the calculation, it will be found that, except for minor differences due to rounding of numbers, the total resources shown in Table A.2 Column (8) against a district equal the total of the planwise total resources shown in the tables of A.3 series against it. But the same will not hold good for their components: population growth and disparity removal. The reason is that Table A.2 assumes that disparity is eliminated in the 20th year, i.e., till that time the indicator values are not changed. But in the plan by plan allocation exercise whose results are shown in Tables A.3.1 to A.3.4, new indicator values are worked out as at the end of each plan, and as a result, a part of the resources for disparity removal gets merged with that for population growth (see paragraph A.29).

Conclusion

A.42   When resources available for reduction of disparity are less than the FFC-defined total backlog, if very few districts (or units) will be benefitted by the use of the alternative method, and if the political advantage of distributing resources over a larger number of districts outweighs the fairness and justice underlying the

alternative method, the FFC's formula for allocation over all backlog districts may be adopted.

A.43   But when the resources for reduction of disparities exceed the FFC-defined total backlog there is no justification for the adoption of FFC's procedure. The alternative approach, based on fairness and justice, should be followed for deciding districtwise allocation directly for each plan till disparity is eliminated.

A.44   Also, it should be clear from the above that, apart from the FFC's method of districtwise allocation of resources for removal of backlog, its starting formula of allocation of 15 per cent for natural growth and 85 per cent for backlog removal will not have a place in the alternative approach. Once a time-frame and the corresponding allocation of total resources to the sector is decided, the alternative method of allocation precisely determines the resources needed on account of both population growth and disparity removal. There is no fixed percentage for either. Where the indicator is not based on population, the problem is simple. The resources for 'ongoing works' will have to be found in the FYP allocation to the district for disparity removal.

MATHEMATICAL NOTES

Note: 1

Requirement of Additional Resources for Elimination of Disparities

1.   Let P, Y and y stand for population, the total of the variable in the numerator of the indicator, and the indicator, respectively. Let further the subscript i stand for the serial number of the district. If k is the total number of districts, i takes the values i = 1, 2, ... k. Let the subscript t stand for the points of time starting with the beginning (t=0) and at the end of successive years (t = 1, 2, ...)

Then, $P_{o,i}$, $Y_{o,i}$ and $y_{o,i}$ stand for the initial values of the population, total of the numerator variable, and of the indicator respectively for the ith district. We have

$$y_{o,i} = \frac{Y_{o,i}}{P_{o,i}} \quad \text{or} \quad Y_{o,i} = P_{o,i} y_{o,i} \quad \quad ....(1)$$

The initial totals of P and Y and the average value of y over all districts are given by P_o, Y_o and $\bar{y}_o$ respectively, and

$$P_o = \sum_{i=1}^{k} P_{o,i}$$

$$Y_o = \sum_{i=1}^{k} Y_{o,i}$$

$$\text{and} \quad \bar{y}_o = \frac{Y_o}{P_o} \quad \quad ....(1A)$$

Similar relationships will hold for any other value of t.

2.   Let r_i be the *known* annual growth rate per unit of population of the ith district. After n years, the population of the ith district is given by

$$P_{n,i} = P_{o,i}(1 + r_i)^n \quad \quad ....(2)$$

3.   Let M be the maximum indicator value, that is the maximum among $y_{o,i}$ (i = 1, 2, ... k). Then, if at the end of n years disparity among the districts is to be completely eliminated,

$$y_{n,i} = M \quad \text{for} \ (i = 1, 2, ... k)$$

and the total $Y_{n,i}$, at the end of n years will be

$$Y_{n,i} = MP_{n,i} = MP_{o,i}(1 + r_i)^n \quad \quad ....(3)$$

The increase in resources Y, required for the ith district denoted by $(dY)_{n,i}$ is given by

$$(dY)_{n,i} = Y_{n,i} - Y_{o,i} = MP_{o,i}(1 + r_i)^n - Y_{o,i} \quad ....(4)$$

The total increase $(dY)_n$ over all districts is given by

$$(dY)_n = \sum_{i=1}^{k} (dY)_{n,i}$$

$$= M \sum_{i=1}^{k} P_{o,i}(1 + r_i)^n - \sum_{i=1}^{k} Y_{o,i}$$

$$= Y_n - Y_o$$

$$= \sum_{i=1}^{k} P_{o,i}[M(1 + r_i)^n - y_{o,i}] \quad \quad ....(5)$$

This gives total requirement of additional resources if disparity is to be eliminated in n years.

4. Now suppose the additional resources supplied in the first year are A and they grow at a rate of g per unit per year. Then the total additional resources supplied in n years are given by

$$S_n = A \sum_{t=1}^{n} (1+g)^{t-1}$$

which, by the well-known result of summation of geometric series, gives

$$S_n = \frac{A[(1+g)^n - 1]}{g} \qquad ....(6)$$

5. By the equation

$$S_n = (dY)_n \qquad .... (7)$$

we can determine the value of n, A or g when the other two values are given. In Table 3 of the text the values of n are given for different values of A and g. They were calculated as follows:

6. Starting with n = 1, values of S_n and $(dY)_n$ were calculated successively after comparing them at each stage. That value of n for which *for the first time* S_n exceeded $(dY)_n$, thus determined n. The process was carried out up to n = 100, and if even then S_n was less then $(dY)_n$, the process was terminated as a situation requiring more than 100 years or an impossible one.

7. The figures in Column (4) of Table 3A give the values of $(dY)_n$ for the specific values of n used in the table and were obtained by a straightforward calculation using equation (5).

8. When the growth rate of population r_i is the same value, say r, for all districts, the solution simplifies considerably. For equation (3) gives

$$Y_n = \sum_{i=1}^{k} Y_{n,i} = M \sum_{i=1}^{k} P_{o,i}(1+r)^n$$

$$= MP_o(1+r)^n \qquad ....(8)$$

9. Now suppose A itself is equal to gY_o that is the growth rate g is the same as the fraction A forms of Y_o,

then $S_n = Y_o [(1+g)^n - 1] = Y_o (1+g)^n - Y_o$

Equating $S_n = dY_n$

$$Y_o (1+g)^n - Y_o = Y_n - Y_o$$

$$\therefore Y_o(1+g)^n = Y_n = MP_o(1+r)^n$$

$$\therefore (1+g)^n = \frac{MP_o(1+r)^n}{Y_o}$$

$$= \frac{M(1+r)^n}{\tilde{y}_o} \qquad ....(9)$$

$$= (1+r)^n \times \text{Ratio of Maximum to average}$$

Which is the second equation given in paragraph 4.4.

Division into Components

10. Now $(dY)_{n,i}$ given by equation (4) can be subdivided into two components.

$$(dY)_{n,i} = MP_{o,i} (1 + r_i)^n - Y_{o,i}$$
$$= P_{o,i} y_{o,i} (1 + r_i)^n - Y_{o,i} + MP_{o,i} (1+r_i)^n$$
$$\quad - P_{o,i} y_{o,i} (1+r_i)^n$$
$$= Y_{o,i} [(1+r_i)^n - 1] + P_{o,i} (1+r_i)^n (M - y_{o,i})$$
$$= Y_{o,i} [(1+r_i)^n - 1] + P_{n,i} (M - y_{o,i}) \qquad .... (10)$$

The first term on the right hand side gives additional resources required purely for population growth that takes place in the ith district to maintain its indicator value at the initial value of $y_{o,i}$ and the second component gives the further additional resources needed, after the growth in population, to raise the indicator value from $y_{o,i}$ to M, the maximum indicator value. Summing over all districts

$$(dY)_n = \sum_{i=1}^{k} Y_{o,i}[(1+r_i)^n - 1]$$

$$+ \sum_{i=1}^{k} P_{n,i}(M - y_{o,i}) \qquad ....(11)$$

For different values of n, the value of the first component on the R.H.S.: additional resources required for population growth, is shown in

Column (2) of Table 3A and the second component: additional resources required for elimination of disparity, in its Column (3).

Indicators not Affected by Population Growth

11. In all cases where the growth in population is not relevant or, when the indicator is not based on population, one has to set $r_i = 0$ for all i in the above formula. As a result

$$P_{n,i} = P_{o,i}$$

for all n and i, and

$$(dY)_{n,i} = P_{o,i} (M - y_{o,i})$$

and $\quad (dY)_n = \sum_{i=1}^{k} P_{o,i}(M - y_{o,i})$

It is easy to see that in all these cases by putting $r = 0$ in equation (9),

$$(1 + g)^n = \text{Ratio of Maximum to average}$$

the first equation of paragraph 4.4 giving the required growth rate g in relation to the initial stock, for a given value of n.

Note 2:

Model of Declining Population Growth Rate

1. The model adopted was, in the same notation as of note 1,

$$P_{t,i} = P_{o,i} \text{Exp} [a_i t - b_i t^2]$$

where t = 0 applied to the year 1981.

2. The values of a_i and b_i for every district were determined by equating the known decadal growth rate R_i observed in the district from 1981 to 1991 by

$$\frac{P_{10,i}}{P_{o,i}} = (1 + R_i)$$

and that the 51st year's population was one per cent lager than that of the 50th year, that is

$$\frac{P_{51,i}}{P_{50,i}} = 1.01$$

3. With values of a_i and b_i thus determined, the population figures for the ith district for years t = 1 to 50 were worked out, and for t > 50, the growth rate of one per cent per year was applied for every district.

NOTES

1. Published (1982) by the Society for the Study of Regional Disparities; 4 Link Road, Jangpura Extension, New Delhi 110 014. My attempt to ascertain whether the Society held another conference on the subject did not meet with success.
2. Published (1983) by State Planning Commission (Planning Department) U.P. Lucknow.
3. Chaired by a former Cabinet Secretary.
4. They are too numerous to list. The two books quoted in this paragraph contain many. Their regularity is reflected in the six critiques I have written so far over the period: 1970 to 1995. (See *ARTHA VIJNANA*, Vol. 12, No. 3, 1970; *Economic and Political Weekly (EPW)*, December 17, 1983; *Social Indicators Research*, Canada, Vol. 17, 1985; *EPW*, October 18, 1986; *EPW*, June 3, 1989 and *EPW*, December 1-8, 1990; and *EPW*, November 11, 1995).
5. The well-known among them are the UNDP's Human Development Index and the Physical Quality of Life Index (PQLI) of Morris D. Morris. Every social researcher who has attempted to 'measure' development and analyze it has created his own.
6. This is what my pointed criticism had been all along in my critiques cited above. None countered it except one, that too ineffectively.
7. Chakravarty Committee did this. See also my critique in *EPW* (1995) quoted above.
8. As a sample, see the scores of indicators used by researchers whose papers appear in the book: *Regional Dimensions of India's Economic Development* quoted in paragraph 1.1
9. See the books quoted at 1 and 2 for the large variety of indicators researchers use.
10. The methods of principal components analysis and factor analysis have been frequently used although the terms are often mixed. For taxonomy, see in the book quoted at 2 the paper: 'Application of Taxonomic Method for Measuring the Level of Development of Various Districts of U.P.', by S. C. Srivastava; and the paper: 'Statistical Evaluation of Development on Socio-Economic Front', by P. Narain, S. C. Rai, and Shanti Swarup, in the *Journal of the Indian Society of Agricultural Statistics*, Vol. 43, 3, 1991.
11. See 6.
12. The GOM's Fifth FYP used for distribution of plan

funds 11 criteria [FFC, 1984, Para 17.8].

13. Like in the case of some other government officials, the author was appointed by the GOM as a member of the FFC in his personal capacity.

14. In November 1995, the Governor of Maharashtra appointed the author as an expert member on the Indicators and Backlog Committee.

15. Based on the FFC Report paragraphs 3.12 to 3.21.

16. The name Bombay is used because the reference in this paper is always to the districts of Maharashtra as they existed in 1983.

17. The FFC Report is rather unclear about this classification. Initially it uses the term Primary for standards I to IV, Middle for standards V to VII, Secondary for standards VII to X, and Higher Secondary for standards XI and XII, and shows data for them in its paragraphs 9.1 and 9.2. But the figure of enrolment in Primary schools per lakh of population given in its Table 9.3 is larger than the equivalent in cent population given in paragraph 9.2. Further, in choosing indicators, it drops the classification 'Middle' and uses the classifications Primary, Secondary and Colleges/Junior College teachers. Therefore the number of primary teachers the FFC used does not necessarily refer, it appears, to standards I to IV.

18. There is a minor mistake in the FFC's Table 17.2 where it gives the heading of its Column (7) as 'Col.(5) as Percentage of Col.(6)' where Column (5) gives the Seventh FYP outlay, and Column (6) the estimated cost of backlog in the Seventh Plan. The meaning of the description of Column (6) is that the cost has been estimated at prices expected to prevail during the Seventh Plan Period. But the cost is of total backlog. Actually, only 85 per cent of Column (5), the Seventh Plan outlay, will be used for reduction of backlog, and the percentage of this reduced outlay to Column (6) has been shown in Column (7).

19. I have used here the Population Census (1991) data shown in the GOM publication: *Economic Survey of Maharashtra, 1993-94*, Table No. 3.

20. It should be clarified at this stage that it is not as if the conclusions in this paper, based on the calculations of the effect of population growth, could be now drawn because of the availability of the 1991 Population Census data. For, essentially the same conclusions could have been reached in 1983-84 using districtwise population growth rates based on the then available data of the 1971 and 1981 Population Censuses.

21. Even though for every district, separately, the growth rate of its population is held constant over the period of 60 years, which equals the average annual growth rate experienced by it from 1981 to 1991, the growth rate of the total population of all districts does not remain the same. This may appear a little paradoxical, but it is true. A little mathematical derivation will show that the growth rate of the total population will continuously increase till it becomes equal to the largest among the district growth rates.

22. The bilingual publication: *Education at A Glance* of the Directorate of Education, Government of Maharashtra, for 1982-83 gives the total number of primary (Std. I to IV) teachers as 170 thousand in its Table JA(Marathi) on page 4. The issue of the same publication for 1993-94 gives the same

number as 242 thousand in its Table 1.4, on page 23, showing an increase of 72 thousand teachers. I have taken about 10 per cent less to exclude Greater Bombay and private schools. Actually the number I have assumed is likely to be on the higher side which does not therefore affect the conclusions based on it.

23. For the same reason given in the note 20, the population projections will generally differ because 1) aggregation of a Region's districts' population is done first before the Region level constant growth rate is applied, and 2) there is a greater extent of homogeneity among districts of a Region in respect of the population growth rate.

24. These calculations faced difficulties in respect of the two sub-sectors of a) I.T.I.s, and b) hospital beds. They were, and were treated, as follows:

a) I.T.I.s: The FFC's calculations of backlogs in their *Report*, Table 10.1, Column (7) are not clear. From its paragraphs 10.5 and 10.6 one does not come to know whether the FFC used the average value of indicator including Greater Bombay, of 45.28, or excluding it, of 49.17. Paragraph 10.6 says that the average used was 49.17, which is clearly wrong because the FFC included Greater Bombay in measuring backlog. But the problem is further compounded because with Greater Bombay's indicator value of 19.51 and population of 82.43 lakhs, the backlog works out at 2,124 or 2,445 if one uses the average of 45.28 or 49.17, respectively. The figure of backlog for Greater Bombay given by the FFC is 1,645! This is inexplicable. I have, therefore, based my calculations on the districtwise indicator values, including Greater Bombay, themselves. But, for working out the figures in Column (6) of my Table 9, on which figures in Table 11 are based, I have used the FFC's total backlog figure of 4,439 to err on the safer side in working out the physical achievement in the Seventh FYP. The correct figure should be 3,972 according to my calculation using the average indicator value including Greater Bombay. The results in my Table 10 are unaffected as they depend only and directly on the indicator values as given in the FFC's Table 10.1.

b) In the case of hospital beds, the FFC Report gives the indicator values in its Table 11.4, Column (5). It also gives them in Table 11.8A, Column (5) after the backlog (of 1,150) in hospital beds of District Civil Hospitals/Medical College Hospitals is removed. The total backlog in the latter case is 7,560 beds. I have ignored the latter indicator because for the long-term calculations that I have done, the small number of hospital beds (1,150) in District Civil Hospitals, and the like, would not make much of a difference in the results. But in working out the physical achievements during the Seventh FYP, I have used the total of the two backlog figures of 7,560 and 1,150, for the purposes of my Table 9 and 11.

25. The Appendix Table A.1 shows the type of analysis done for every sub-sector considered here.

26. I am grateful to the Director of Economics and Statistics, Government of Maharashtra for providing me with the necessary data.

27. This was based on my paper: 'Optimum Allocation of Financial Resources for Reduction of Regional Disparities - An Exercise in Programming', *ARTHA VIJNANA*, Dec. 1983, Vol.25, No.4.

THE POLITICAL ECONOMY OF INDIAN SUGAR

Sanjaya Baru

Sugar is produced by joint stock mills, both public or purely state-owned and private, the private mills comprising big business houses as well as the cooperative sugar mills, today the largest sector within the industry but with most of the capital invested by governmental and semi-governmental agencies. The sugar economy is one of the most regulated sectors- in addition to a variety of duties and subsidies, the state specifies the price at which mills buy cane, the levy-sugar price, the price at which almost half the output is sold on the 'free market', the monthly releases onto the open market, the wages paid to the worker, the rate of return on sugar and its by-products, and so on. However, the sugar cycle persists, despite controls. This paper analyses the price-output relationships in the market for sugar and the sugar mill industry, with specific reference to the long gestation period of sugarcane crop, and the competition from the non-organized processing sector (namely, gur and khandsari). The technical, locational and ownership characteristics of the sugar industry and the nature of the pressures that come to bear upon the state while formulating its sugar policy are highlighted.

I. INTRODUCTION

The sugar economy in India in many ways constitutes a microcosm of the Indian economy, in which there are inter-meshed a wide range of social groups who play an important role in the formulation of economic policy at a wider level. Sugarcane is grown in all the major states of northern, western and southern India. It is largely cultivated by small and medium peasants in eastern Uttar Pradesh (U.P.)[*] and Bihar, by rich peasants in the Punjab, Haryana and Western U.P. and by rich peasants and landlords in the sub-tropical region. Sugar is manufactured by joint stock mills, both in the public and private sectors, and by purely state-owned mills. In the private sector sugar is manufactured by big business houses. The cooperative sector, which is today the largest sector within the industry, is essentially controlled by the rich peasant and landlord groups, even where the capital invested is largely provided by governmental and semi-governmental agencies. In the pre-Independence period, a small group of foreign, mainly British entrepreneurs also controlled sugar mills in several parts of India. They were organized into the Indian Sugar Producers' Association (ISPA). Their share of the market was soon overwhelmed by another organisation the Indian Sugar Mills Association (ISMA), and many of their mills have either closed down or have been taken over by Indian entrepreneurs.

On the production side, therefore, all the major economic groups in the country are represented: the industrial and agrarian capitalists, the landlords, the national business houses/groups. On the consumption side, sugar is still essentially an urban and a semi-urban consumption good, but it is fast increasing its share of the rural consumption basket. Economic policy makers have often questioned why sugar should be regarded as an 'essential' commodity, why price controls should be imposed and sugar sold through ration shops, when it is in their view only an upper-class consumption good, if not a luxury. Despite such opinions rising sugar prices are a nightmare for a popularly elected government. Sugar prices, like the price of rice and onions, have managed to destabilize governments.

The importance of the sugar economy for an economist also derives from the fact that it is one of the most regulated sectors in the economy. The price at which mills buy cane is specified by the central government, and state governments proceed to 'advise' mills to pay higher prices. The price at which almost half the output is now sold on the 'free-market' is also regulated by the government which controls the monthly releases onto the open market. Of course, the levy-sugar (or rationed sugar) price is specified by the government. There are also a variety of duties and subsidies which are extracted and offered by the government. Needless to say, as in most other

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[*] The list of abbreviations with their full forms is provided at the end.

major industries, the sugar industry is subject to the provisions of the Industries (Development and Regulation) Act of the Government of India (GOI), which, among other things, means the licensing of new units, their location, and size, all require the sanction of the government. The wages paid to the worker, the price paid for the cane, and the rate of return on sugar and its by-products, are also subject to official regulation and monitoring.

The fact of such pervasive regulation, along with the fact that it is an industry in which both industrial and agrarian capitalists have invested heavily, means that contradictory pulls and pressures are bound to operate upon government policy. Controls can never remain static or be insensitive to such pressures from the growers, millers and the more vocal sections of the consumers, especially the urban and semi-urban middle classes. It is a combination of such interest groups that makes the formulation of sugar policy an extremely difficult job for the administrator and politician. Quite clearly, economics, technology and politics are all closely intertwined in the sugar economy.

There are few aspects of sugar policy, ranging from pricing to technology, which can be properly understood, let alone analysed, without appreciating the inter-linked nature of the sugar economy. Indeed, it is also necessary to appreciate the historical origins of certain problems in order to arrive at any contemporary solution to them.

This study, therefore, attempts to examine the contemporary economic and technical problems facing the industry in the context of its history, and the extant social and political milieu in which such problems have to be resolved.

This paper falls into three parts linked through a common argument on the political economy of state intervention in the Indian industrial economy in the specific context of the sugar mill industry. Part 1: nature of the pressures that came to bear upon sugar policy in India in the inter-War period and up to Independence; Part 2: structural changes and related issues - like technical change, and the locational and ownership characteristics of the mill sector; and Part 3 price policy and the price-output relationship, the political economy of state intervention in the market for sugar and the sugar mill industry, and the persistence of the

sugar cycle, despite price controls, which have obviously helped the government manage, though not eliminate the recurrent crises of shortages and gluts. In a long gestation crop like sugarcane, and in a commodity like sugar, where the producers have to compete with the non-organized processing sector (namely *gur* and *khandsari*), the only way in which output can be stabilized and prices insulated from the periodic fluctuations in output, would be through the creation of a buffer stock in sugar.

II. GROWTH OF MODERN SUGAR MILL INDUSTRY IN INDIA: 1932 TO 1937

Both before and after Independence the white sugar mill industry has been closely guided by state policy and intervention and singularly benefited from the policy of 'discriminating protection'. In the years following the granting of tariff protection in 1932 there was almost a four-fold increase in both the number of operating mills and in the output of cane sugar, coupled with a rapid decline in imports. While European firms played a pioneering role in the origin and growth of the white sugar mills in India, particularly in the nineteenth century and early twentieth century, Indian capital in U.P., Bihar and Bombay expanded rapidly as a result of tariff protection. This protection was itself granted because there appeared to have been no direct conflict of interest between the growth of a sugar industry in India and imperial economic interests. On the other hand, Britain, concerned about the increasing imports of sugar from Java, a Dutch colony, may have been interested in restricting this inflow by building up an indigenous sugar mill industry in India.

Growth of the Modern Sugar Mill Industry Till 1932

In the 1790s, the East India Company encouraged the manufacture of white sugar in order to make the most of an extremely profitable market in Europe. The company exported sugar from Bengal to England. In the subsequent period, the policies of the British Crown began to have an important bearing on the growth of the sugar industry in India. However, Indian sugar was not

in a position to compete with West Indian sugar on the British Market. While unequal import duties worked against Indian interests, the fact was that even equal import duties would have militated against these interests, since West Indian sugar was cheaper, cultivated as it was with slave labour. In 1836 Britain made changes in import duties which benefited Indian exports. India gained not only on account of such modifications, but also because of the emancipation of slaves in the West Indies, which helped to move British capital away from the West Indies to India. This facilitated an increase in Indian exports to Britain so that over the next decade there was an expansion of the sugar trade. By 1846 India was annually exporting as much as 60,000 tonnes of sugar to Britain [Mehta, 1955, Pp. 4-5]. However, in 1846 Britain dispensed altogether with import duties and restrictions on sugar, and this increased West Indian competition and caused decline in production of the white sugar mills in India. However, in 1890 the Government of India imposed countervailing duties on the bounty-fed beet sugar that was being imported into India, giving some encouragement to white sugar manufacturers in India.

In the intervening period (from 1846 to 1890) there was a gradual decline in the white sugar manufacturing 'gur-refineries', from about six mills in 1851-62 to one mill in 1887-90 [Rungta, 1970, p. 184]. The Indian sugar mill industry received a severe blow during the second half of the nineteenth century as a result of the decline in exports to Britain. By the turn of the century, a home market for white sugar was beginning to emerge. However, the Indian sugar manufacturers were not able to expand within the home market since the plantation sugar from Java and Mauritius was cheaper at the Indian ports even after accounting for freight because of their lower costs of production (on account of the availability of better quality cane). In 1932, the Government of India imposed a protective duty of Rs 7-4-0 per cwt with a surcharge of 25 per cent, so that the total duty as of April 1932 was Rs 9-1-0 per cwt. Imports as a whole and from Java in particular fell dramatically in subsequent years. With the growth of the modern white sugar mills in the 1930s, where sugar was manufactured directly

from cane, *gur* refineries declined in importance. Around this time, the sudden decline of the Indigo industry as a consequence of the emergence of synthetic substitutes aided the growth of the sugar mills in the region [Bagchi, 1972, p. 363]. Nevertheless, the rate of growth as a whole was still much less than what the market would have dictated. India still imported nearly 90 per cent of its consumption in 1927-28. The main constraints on the growth of the sugar mill industry, which prevented more mills from coming up and forced India to depend largely on imports, were the following: (a) the low average sucrose content of Indian cane as compared to Javanese and West Indian canes, (b) the low level of development of cane processing technology, (c) inadequate investment in cane. Finally, an important barrier to the growth of the modern sugar mills was the disjunction between farm and mill. The factory had to compete for cane with cane processors who had centuries-old linkages with the grower.

State Support for the Modern Sugar Mill Sector

State support to the growth of the sugar mill industry often was an indirect spin-off of a policy formulated for some other purpose. Revisions in import duties never had the protection of the mill industry as their purpose. Their sole purpose was to augment the revenues of the government. Similarly, government investment in irrigation work did benefit cane cultivation but the motivation for such investment was once again revenue. However, public investment in irrigation encouraged the utilization of better and newer varieties of cane and encouraged research in cane development. In 1912, a sugarcane breeding station was set up in Coimbatore, where high-yielding varieties of cane, specially adaptable to the sub-tropical regions of northern India, were developed. 'Until the 1920s, (the) government's interest in the technicalities of cane, and the prospects for its improvement, was marginal' [Whitcombe, 1980]. Indeed, irrigation played an extremely important role in the spread of the sugar industry. More importantly, this subsidized irrigation made provision for cheap water - a very important stimulant in both pre-Independence and post-Independence India.

In October 1919, the Government of India constituted the Indian Sugar Committee at the instance of the European dominated ISPA. In its report, submitted in 1920, the Indian Sugar Committee identified 'access to raw material' as the main problem confronting the sugar mill industry in India. While the committee favoured the establishment of a sugar mill industry in India, the government was unable to resolve the problem of what kind of equation should be allowed to emerge between the sugar mills and the traditional *gur* and *khandsari* producers. The government was also unwilling to allow the formation of plantations which they said would disturb existing land tenures and dispossess peasantry. As a result, the report of the committee was pigeon-holed. The next important intervention made by the Government of India in the sugar economy was in 1929, when it set up the Imperial Council of Agricultural Research (ICAR) and constituted within it the sugar sub-committee composed of technically qualified people, related government representatives (directors of agriculture and so on) and a representative of industry. At its very first meeting, the sugar sub-committee recommended to the Government of India that a tariff enquiry be instituted to examine the case for tariff protection to the sugar industry. The Indian Sugar (Protection) Bill, 1932 was passed and, in effect, protection was granted for a period fourteen years, and was later extended till 1950. The Tariff Board argued that '(t)he strongest aspect of the case for cane became central to the concern of tariff policy because of the fear generated by the world depression and its implications for Indian agriculture, especially in the context of increasing agrarian unrest and the occurrence of peasant revolts across the country' [Khara, 1939; Adarkar, 1936, 1939].

Impact of Protection

The immediate impact of protection on the industry was to increase the number of mills and the production of sugar. The total number of sugar mills in British India went up from 27 in 1929-30 to 112 in 1934-35. As much as Rs 30 crore was invested in the sugar mill industry during 1932-34. By 1936 there were 137 mills in British

India and the Indian States. During the 1930s' depression, there was a temporary withdrawal of the more 'reputed' European mill machinery firms from the market and an opening up to the less efficient firms. Indian sugar manufacturers were willing to buy inefficient and out-of-date plants from European mill machinery manufacturers of little repute on account of the fact that a fast expanding home market had to be captured immediately. Not only was some of the machinery out-of-date and second-hand but several of the new mills were regarded as being below the minimum economic size. That Indian millers were willing to import 'sub-optimal' technology could be explained by the fact that such technology was considered 'optimal' in the specific Indian context of the time: paucity of funds and a market suddenly opened up and invaded by an army of entrepreneurs, thereby making vast investments in capital-intensive, costlier technology a risky venture.

A second problem caused by this rapid growth, was the mushrooming of factories in the northern parts of Bihar and eastern U.P., the two areas which attracted the largest number of mills. Overcrowding would result in steep increase in the price of cane. Hence the importance of assigning zones to factories was noted by government functionaries. The idea was not only to eliminate competition between factories for the cane, and thereby, create a stake in cane development for each factory in its zone but also to ensure adequate cane supply to each factory. The burden of government policy towards the sugar mills in the years following protection was essentially this, to reduce the cost of production of sugar by improving the quality of cane and to assure an adequate supply of cane for the sugar mills. This obvious concern for the miller implicit in government policy, brought forth complaints from agriculturists.

Cane Development and the ICAR

The cost of cane constitutes as much as 75 to 80 per cent of the cost of production of sugar, hence, making cane cheaper and more bountiful in sucrose was very high on the agenda of government policy. The second important contribution

of the government was in financing large and
medium scale irrigation projects. The provision
of water immediately improved the quality of the
cane, which is highly dependent on water supply.
Through the 1930s nearly a third of all ICAR
funds went directly or indirectly into research
connected with the sugar industry. The funding
for the activities of the sugar committee consti-
tuted within the ICAR came from the Sugar
Excise Fund collected by the government from
the mills. The major head of expenditure was, of
course, cane. ICAR had from its inception a
programme for implementing the government's
decision to foster the development of sugarcane
cultivation in India. This programme was in three
parts, two of which concerned themselves only
with the needs of the white sugar industry. The
three features of its programme were: (a) the
selection of cane better suited to the important
cane growing tracts than the existing local vari-
eties and their cultivation; (b) the improvement
of local methods of making *gur*; and (c) the
development of an advisory and research service
for the sugar factories. During 1930-35, as much
as Rs 35 lakh was spent by the Government of
India on sugar research. The work of the ICAR
was carried out essentially through it sugarcane
research stations. Despite this, the industry put
constant pressure on the Government, claiming
that its contribution was inadequate and asking
for more help from ICAR and the directorates of
agriculture.

Cane Procurement by Mills

The question of how to ensure an adequate cane
supply for sugar factories throughout the season
came up fairly early in the proceeding of the sugar
committee. At its meeting in March 1933, the
sugar committee considered a proposal for the
adoption of a zone system, that is to say, creation
of reserved areas (zones) around factories which
would be the exclusive territory of specific fac-
tories which they would develop in sympathy
with the small holder. Some factories especially
in eastern U.P. had solved the problem of cane
supply by using the existing systems of agrarian
control to establish the peasant's dependence
upon the factory. Using the existing relation of

dependence in the countryside, the millers erected
a procurement system that essentially operated
through 'extra economic' pressure. In other
words, local landlords and/or merchants com-
pelled the peasant to cultivate cane and then to
supply it to them. They in turn sold it to the cane
factories. The peasants were forced into this
arrangement because they were, in one way or
another, indebted to the landlords and merchants.
This supply of cane was used to redeem, in full
or in part, the peasant's debt to the lender. The
mills did not have a direct access to the peasant
and this discouraged any attempt towards cane
development on the part of the mills. While the
mills did recognize this deficiency and from time
to time talked of doing away with the intermediary
and establishing a direct relationship with the
cane cultivator, they were not in a position to do
this, particularly in parts of U.P., because of the
nexus that existed between the local landlord
and/or merchant and the peasants.

The mills were willing to accept the zoning of
cane areas so as to eliminate competition amongst
themselves; but this was not acceptable if zoning
was to be combined with minimum price regu-
lation. They preferred the operation of the 'law of
supply and demand' to determine the price of
cane. On the other hand, zoning without a mini-
mum price for cane was totally unacceptable to
the peasants. The conflicting interests of the
cultivator and the miller, where the gain of the
former in terms of an increased price for cane was
a loss to the latter, came in the way of any
resolution of this problem.

Pricing of Cane

The Tariff Board, in determining the fair selling
price of sugar had assumed a price of cane at 8
annas per maund at the factory gate while, in 1933,
factories in U.P., Bihar and Orissa were paying
as low as 3 to 3.5 annas per maund, despite the
fact that in 1931 the Indian Tariff Board (ITB)
had estimated the cost of cultivation of cane at 4
to 5 annas per maund in U.P. and Rs 0-5-6 in
Bihar. Even in Bombay, where cane mills had
leased in land from the peasant and set up
factory-managed cane farms, a low rent was paid
by the mills to the peasant, from whom the land

was leased. For the government, there was the question of political stability at stake, given the increasing incidence of peasant unrest in the cane cultivating regions; they had appeased the miller by granting protection, they could now no longer afford to ignore the cultivator.

The first moves to appease the farmer came in the form of a provincial government order requiring all mills in U.P. to put up notices outside their mills announcing the price being paid for cane. In November 1933, the U.P. Government also introduced a rule by which, along with the price actually paid for cane, an estimate of the price 'payable', calculated according to a standard formula, also had to be notified. The formula was given as:

$$C_t = \frac{S_{t-1} + P_t}{200}$$

Wherein

   C_t = Price of cane in annas per maund at the factory gate in year t;

   S_{t-1} = Average extraction percentage of cane (sucrose content of cane) in year t-1;

   P_t = Price of sugar in annas per maund prevailing in year t (later specified as the highest whole-sale price for sugar).

In computing the price of cane it was assumed that the cost of cane accounted for half the cost of production of sugar. In fact the cost of cane was more than 50 per cent of sugar cost. The Indian Tariff Board estimated in 1931 the cane cost to be about 66 per cent of production costs. Thus, the adopted formula allowed the cane grower a lower share of the realised value than he was entitled to. While it assured the grower a 'minimum price' for cane, a sliding scale was adopted to calculate an 'additional price', varying with variation in sugar prices. Such variations were estimated once a fortnight. However, the cane price changed less than proportionately with changes in sugar prices because the so-called 'sliding scale' system did not clearly ensure that the cane grower's share of the sugar price remained constant across all price ranges. When the price of sugar increased, the price of cane did not increase proportionately but less than proportionately (since for every 8 annas increase in P, C increased only by 3 pies). The grower secured

a smaller share of the sugar price the higher the price above the stipulated minimum. Further, the cane price was linked to the sugar price as it prevailed during the crushing season, since the cane price was revised fortnightly during this time. This meant that the farmer did not benefit from the higher sugar prices that prevailed in the non-crushing season namely, May to October.

A second problem relating to cane pricing policy was that, given the monopsonistic position of the mill and its ability to push down the price of cane, the 'minimum' price in effect often became the 'maximum' price. In the 1930s the steep increase in sugar production led to a tremendous increase in cane cultivation and farmers were forced to part with their cane at very unremunerative prices. The minimum price legislation in such a context meant that the mill was legally forced to pay a fixed price - and perhaps this was paid, but rarely did mills pay anything more. During the 1937-38 and 1938-39 seasons the sliding scale system was abandoned and only an irreducible minimum price for cane was stipulated. While under the sliding scale system the minimum price for cane was linked to the sugar price and, therefore, could be depressed if the latter was itself depressed, in the new system the minimum price for cane had to be paid irrespective of the sugar price. The stipulation of such a minimum price assured the cane grower of at least the stipulated price. This concession to the grower was made to balance the more important concession given to the miller in 1937, namely, the permission to form a selling syndicate. The new system did not facilitate, however, the possibility of the farmer securing a share of the higher sugar prices that came to prevail under the impact of the Syndicate. Therefore, in 1939-40 the governments of U.P. and Bihar modified the pricing system once again. With the modified system, the cane price could not fall below a certain minimum (this minimum being fixed irrespective of the sugar price). Above the minimum price, the cane price was linked through the sliding scale to the sugar prices prevailing on the market. Despite these modifications, the cane price was still only linked to the price of sugar as it prevailed during the crushing season. This was rectified in the 1940-41 season when the grower was to be paid

an additional price based on the sugar prices in the non-crushing season. However, this system lasted only for one year, since in 1942 war time controls were imposed on the sugar industry and both the pricing and distribution of sugar came under complete government control.

An extremely important element that began to emerge in the pricing of cane from the mid-1930s onwards was the political element. There was, of course, an element of ambiguity in the role of the Congress Party introduced by the fact that while its political and electoral base rested with farmers, millers were its financiers. Radical elements in the Congress, would openly come out against the industry, charging it with exploiting both the grower and the labourer. On the other hand, more 'skilled' Congress leaders would fight for the farmers cause without alienating the support of the miller. In 1936-37, when there was a sugar crisis brought about by over-production, Rajendra Prasad succeeded in getting the mills to extend the crushing season so as to at least partly relieve the distress of the farmers. It has been argued that the millers responded to Rajendra Prasad's call because they believed that the Congress Party would soon form the provincial government and this gesture could later be used to demand concessions from the new government. Until this point, the cause of the peasant had never been championed in this manner; but the growth of electoral politics introduced a dimension to sugar policy that was to become even more obvious in later years. Nevertheless, the millers still had the greater say in policy making. Instances of Congress provincial governments acting in favour of the millers and against the workers are numerous in almost all regions and industries.

Thanks to the policies pursued with respect to sugar and cane pricing and the expansion of the home market, in the first few years after protection was granted the sugar mill industry made substantial profits, expropriating a docile peasantry, an ill-organized working class and a captive home market. The policy of protection facilitated the emergence of an influential and prosperous group of businessmen, while it did not fundamentally alter the position of the peasant, who continued to be at the mercy of the millers and the local landlord-money lender.

III. GOVERNMENT, THE SUGAR SYNDICATE AND THE SUGAR MILL INDUSTRY, 1937 TO 1947

While sugar imports declined from 500,000 tonnes in 1931-32 to 9,410 tonnes in 1937-38, domestic production shot up from 221,580 tonnes in 1931-32, to 1,137,000 tonnes in 1936-37. The per capita availability of sugar also increased from an average of 6.3 lbs in 1931-34 to 7.0 lbs in 1936-39, while the number of sugar mills in operation recorded a four-fold increase. After reaching a peak of 137 mills in operation in 1936-37, the rate of growth of both, the total number of mills and the total capacity and output, tapered off through the latter half of the 1930s. The peak-to-peak simple growth rate of sugar availability (domestic production plus imports) was 29.4 per cent for 1931-32 to 1936-37. This came down to 14.35 per cent for 1936-37 to 1939-40. In short, the phase of rapid growth following the grant of protection lasted for the duration of one sugarcane cycle (about 4 to 5 years) and then tapered off. This 'tapering off was not the product of a supply constraint, either in terms of cane availability or shortage of financial resources, but was in fact a reflection of a demand constraint. When sugar production peaked in 1936-37 the price of sugar rapidly came down from Rs 8-10-0 per maund in August 1936 to Rs 6-8-0 per maund in February 1937 (in the Kanpur market). What the sugar mill industry confronted in 1936-37 was an over-production crisis. The limited boost that the policy of discriminating protection had given was soon dissipated through the inability of the home market to absorb what was produced.

The Indian Sugar Mills Association came forward with two proposals: to restrict the further growth of the industry in U.P. and Bihar; and to regulate the price and sales of sugar in the home market. The move to form a cartel of sugar millers, called the Indian Sugar Syndicate, originated in this context.

Emergence of Market Control in Sugar

Together, the top 6 or 7 business houses controlled a large share of the output, though individually not one of them controlled even 10 per cent of the total. During the 1931-33 seasons the

seven dominant manufacturing business houses contributed at least 40 per cent of the total output. The other 60 per cent of the output, however, was distributed across a large number of mills with a highly dispersed ownership. Despite the obvious dominance of certain business groups within the sugar mill industry, so many small firms came into existence, due to two peculiar characteristics of sugar in India: the absence of product differentiation weakening entry barriers; and the structure of cane supplies to the mills. The absence of product differentiation meant that no sugar firm tried to utilize brand names nor differentiate quality in terms of colour and crystal quality (for reasons we have been unable to ascertain). The problem of cane supply was essentially that the existing mills could not expand capacity beyond a certain point since they would have to bring cane from greater distances than was practically feasible. This implied that a new entrepreneur with a new mill in a new location did not face any handicap vis-a-vis the established entrepreneur. Further, in several places in U.P. local landlords were involved in setting up mills. For all these reasons ownership in the sugar mill industry was generally dispersed. This dispersed ownership, and the absence of any single dominant firm made it possible for a cartel to emerge. Earlier, sporadic attempts were made time and again but in vain. ISMA realized that a cartel could succeed under these circumstances only if 'all sugar manufacturers could be persuaded to join the organisation'. Apart from the problem of over-production in 1936-38, other developments in the sugar industry also contributed to the formation of the Indian Sugar Syndicate in 1937, e.g., the growth of the mill industry outside U.P. and Bihar. The increasing volume of production in provinces like Bombay, Madras and Hyderabad began to threaten the mills in U.P. and Bihar because the former were the major markets for the latter's sugar. Therefore, any growth of the industry in these regions threatened the survival of the north Indian mills. Tropical peninsular India was emerging as a serious contender for new sugar mills when compared to sub-tropical northern India. The U.P. and Bihar mills sought to partly offset this growing competition by

securing freight concessions from the government so that their sugar could be sold more cheaply in the western and southern markets while at the same time their profit margins could remain unaffected. By 1937, the conditions favoured the formation of a syndicate. The top four producers had all gone in for an expansion of plant capacity. More than 60 per cent of the output in 1936-37 came from mills with a daily cane crushing capacity of 601 tonnes and above, while in 1933-34 as much as 70 per cent of output was produced in mills with less than 600 tonnes capacity. This dramatic skewing in the distribution of output in the higher size-classes of mill capacity was the product of the drive by sugar mils to increase their individual market shares.

Formation of the Indian Sugar Syndicate

In July 1937, the mill owners of U.P. and Bihar formed the Indian Sugar Syndicate (ISS) with a membership of 92 mills. It was set up to pool sugar and release it in the quantities required by the market and to allot quotas and fix prices for members. It was also to regulate and control production and had the power to buy, sell, import or export sugar and other by-products. The basic price of sugar belonging to members was fixed for the stocks pooled, with reference to the average prices at which the members' sugar had been sold at in February 1937. The selling rates, which were fixed at 'so many annas' above the basic rates, were gradually raised over time, so that on 30 November 1937 the difference between the basic and selling rates was 12 annas per maund. 'The basic rate represents the price at which the Syndicate purchases the sugar of members. Therefore, this difference between basic rate and selling rate accrued as a rate earning of the Syndicate and was distributed pro rata at a later date, among the members, according to the quantity of sugar pooled by them with the Syndicate. The fact that a syndicate was formed within an atmosphere of cut-throat competition among mills, that there was no single really important leader in the sugar industry, that some mills continued to remain outside the Syndicate and, finally, that there were some members of the Syndicate intent on sabotaging it, meant that the

Syndicate was under constant threat of failure and needed official support for survival right from the beginning. Also, prior to the Syndicate, the burden of financing stocks lay with the merchant. The Syndicate, however, had maintained no capital to finance the accumulated stocks, thereby pushing the burden onto the factories. This had created tremendous financial pressures within the industry that was bound to render the Syndicate ineffective. By October 1937 mills began to withdraw from the Syndicate. Such a crisis was only averted with the help of state intervention, which came in December 1937 and January 1938 when the Bihar and U.P. governments, respectively, granted official recognition to the ISS and made membership of the ISS compulsory for all mills.

Sugar prices reportedly escalated after the formation of the Syndicate, rendering U.P. And Bihar sugar very costly at the ports and in the south. Thus the working of the Syndicate allowed the Bombay and Madras mills to increase their prices and their share of the market. The demands were now being made for 'all-India' control and the extension of the Syndicate's activities to other provinces under official patronage. The Bombay and Madras mills opposed any control by the Government of India. Having failed to secure the help of the Government of India, the U.P. And Bihar mills settled for provincial government support. A ceiling was imposed on the growth of mills in these two states in 1937 and 1938, respectively, by the Sugar Factories Control Act. Thus under the Act, the Syndicate received official recognition, becoming a quasi-official body with government directors on it, though actual governmental control over the day-to-day working of the ISS was minimal. The Act stipulated that all factories in U.P. And Bihar had to secure a licence in order to continue crushing cane, and that this licence could be secured only by mills which would become members of the Syndicate. This rule naturally brought all the mills into the fold of the ISS. Before the act became operative in December 1937, only 35 of the original 92 mills had remained within the Syndicate. In 1938 the membership of the ISS had rose to 106 mills. The 'new' ISS standardized and classified all the sugar manufactured by its member mills. In 1935 the

Bureau of Sugar Standards (attached to the office of the director, Imperial Institute of Sugar Technology) had already drawn up a set of standards for sugar and circulated it to all the mills. The standardization of sugar now became imperative because the ISS had to price the various grades of sugar supplied by its member mills. It was stipulated that the price of sugar to be fixed by the ISS was to be a 'fair' or 'reasonable' price and not a 'monopoly' price. In other words, the government warned the ISS not to inflate the prices. The ISS ignored this condition when in the first half of 1940 it steeply increased the price of sugar. As a result, the government withdrew its recognition to the ISS in June 1940, pushing the ISS into a minor crisis when member mills began to quickly withdraw from it. The government once again extended its recognition in August 1940.

The Sugar Factories Control Act, 1938 provided for the licensing of sugar factories and control over production and capacity utilization by the ISS. It accepted in principle the concept of a 'fair price' (cost-plus) for both cane and sugar. It also brought into existence the sugarcane cooperative societies, which were to be growers' cooperatives responsible for supplying cane to the mills and organizing the cane growers. The Act also created what were called 'reserved' and 'assigned' areas for each mill, whereby each mill had an exclusive access to cane in its reserved area and had a priority over other customers for cane in assigned areas. The cane cooperatives became an important rural institution especially in U.P., where they became intermediaries between the cane grower (often a small or medium peasant) and the mill. Over time these cooperatives increasingly came to be controlled by rich peasants, cart owners, merchants and landlords, and while the cane cooperatives may have succeeded in extracting a higher price for cane from the miller they did not necessarily pass on this price to the actual grower, since the intermediaries who controlled the cooperatives skimmed off this surplus. In the Sugar Factories Control Act of 1938 we find the full blossoming of the political economy of sugar policy, as it had then emerged. It satisfied the interests of the mill owners by granting recognition to the ISS and it gave particular clout to the

leadership of these mills, those who had an effective say in the ISS, by awarding the ISS the right to grant licences to sugar factories. At the same time it allowed the millers' representatives to run the show, by asking the government nominees on the board of the ISS to remain 'passive' members. While the Act sought to help the grower through the institution of the cane cooperative and the concept of an 'irreducible, fair, minimum price' for cane, it was mainly the rural gentry who seemed to have benefited. The official recognition of the notion of an 'administrative price' administered by the Indian Sugar Syndicate was in practice the major outcome of this Act - and a major victory for the millers. Already assured of a home market and of the systematic supply of cane, the miller was now assured of stable profits as well. The formation of the Indian Sugar Syndicate was, therefore, an important event in the history of the Indian Sugar mill industry. It succeeded in restricting output after 1936-37, so that the problem of overproduction only emerged again after the lifting of wartime controls. The government played an extremely important role in making the Syndicate succeed by insisting upon compulsory membership for all the mills. The formation and operation of the Syndicate reveals the close nexus that existed between the sugar millers, the provincial government and, increasingly, the emerging nationalist leadership.

The Syndicate, Congress Leadership and Sugar Policy

Market controls are essentially of two types: there are those controls that the industry subjects itself to, what may be called voluntary controls, and those that the government subjects the industry to. Voluntary controls in the form of selling agreements, the division of markets, monopolistic pricing of raw material, the regulation of output, and so on, were attempted by the sugar industry in the period prior to 1938. In this period the important forms of state control were those of the regulation of cane prices and the important duties on foreign sugar. The first major state intervention following the Sugar Industry (Protection) Act of 1932, was the Sugar Factories

Control Act of 1938 in U.P. And Bihar. While the former was aimed at protecting the home market, the latter was aimed at regulating it.

In 1938 the second tariff enquiry on sugar was conducted by the Tariff Board, which recommended that tariff protection be continued till 1946. The Tariff Board drew the attention of the government to the need for rationalization of the industry under some form of 'state control'. Now assured of both continued protection and of official recognition for the Syndicate, the mills began to push their prices upwards. This pressure was aided by a shortfall in cane production and a consequent fall in sugar output during the 1938-39 seasons. During this time nothing was done towards rationalizing the sugar industry, though the Syndicate was once again allowed to increase the price of sugar. The market was buoyant and merchants now were willing to speculate and to allow prices to rise, because, after the experience of the 1936-37 crisis, warehousing and storage facilities had considerably improved and it was now possible for the trade to hold more stocks. As a result of this steep price rise in 1938-39, the sugar production increased sharply in 1939-40. This was 'natural increase' caused by cane coming out of the trough of the 1936-39 cycle. By March 1940, it was quite obvious to the industry that once again sugar production was going to touch a new peak and the markets would be saddled with excess stocks. The scenario was a familiar one. The mills decided to stop crushing early; the provincial governments and the Congress Party intervened to avert this; the mills were persuaded to extend the crushing season; still prices continued to rise under the pressure maintained by the ISS; convinced that this was the wrong strategy, many mill-owners wanted to leave the Syndicate, but this time the official status of the Syndicate prevented them from doing so. The ISS resolved that, 'The Syndicate should request the Government of India to control the sugar industry on an all-India basis including the Indian states, if possible, failing which it should at least force them to join a sales organization' [see letter dated 28-1-1941, from Chief Executive Officer, ISS to Secretary, GOI, WHC/NMML, *Walchand Hira Chand Papers*, Nehru Memorial Museum and Library, File No. 494, Part II]. With

Bombay and Madras free to increase production and undercut north Indian sugar prices, how could any U.P. And Bihar based cartel operate successfully? However, the demand for all-India control was rejected by the Madras and Bombay mills. The development of the sugar industry outside U.P. And Bihar was essential, because, natural calamities, like floods, pests, epidemics, etc., would destroy the whole industry, if it were concentrated in limited tracts. Under an 'all-India control' Bombay factories were afraid of not getting a fair deal. In the face of such opposition the Government of India could not accept the Syndicate's proposal and, having failed to secure an all-India status for the ISS, it was thought best that the ISS be dissolved. The threat of competition from Madras and Bombay was too grave and the Syndicate was doing nothing to meet their threat. Indeed, on the contrary it was taking a suicidal path by further pushing up prices and inviting even greater competition from the other regions. On the other hand, open competition may help in closing down several weak and high-cost mills in U.P. And Bihar and improve position in the market. In recommending protection which would add to the consumer's burden, the Fiscal Commission had visualized complete freedom of competition as the safeguard against prices being pushed up to unduly high levels, and with the formation of the ISS this safeguard had ceased to operate in the case of sugar. In June 1940, the U.P. And Bihar governments withdrew recognition to the Syndicate by rescinding the rule under Section II(a) of the Sugar Factories Control Act (the clause which required all factories to be members of the Syndicate in order to qualify for a crushing licence). Through the months of June and July 1940 the price of sugar fell drastically, from around Rs 8 to Rs 9 per maund, to Rs 5 to Rs 6 per maund.

Nehru seemed to support the idea of an all-India control over the industry, but of State control in co-operation with representatives of the industry and the cane growers. Absence of state control means cutthroat competition, chaos and disaster. Rajendra Prasad chose to support the idea of the revival of the ISS mainly because he believed that this would afford relief to the cane growers, who were being adversely affected by the falling sugar

prices. On 3 August 1940 the governments of U.P. And Bihar issued a joint communique restoring recognition to the ISS, but they made it imperative that the price of sugar be regulated within a specified range and decided to maintain a check on the sale of sugar and appointed a civil servant as Sugar Commissioner, who was responsible for the daily administration of the ISS. Regarding the problem of paying cane arrears to the farmers and of how to reach an agreement with the farmers on the amount of cane to be crushed in the 1940-41 season, Prasad played a very important role as a mediator between the millers and growers. Thanking him for his services, Karamchand Thapar wrote to Prasad on behalf of the ISS and ISMA hoping that he would 'exert (his) kind influence to make both limbs of the sugar industry (growers and millers) understand each other' [see letter dated 19-9-1940, K. Thaper to R. Prasad, RPP/NMML, *Rajendra Prasad Papers,* Nehru Memorial Museum and Library, File No. ix/40]. Needless to say, the Congress Party and its leaders, like Prasad, became increasingly involved in the political economy of sugar policy over the years to come. The Syndicate continued to operate till wartime controls came in 1942.

In 1937-40, the situation was slightly different in other sugar producing provinces where, for one thing, inter-firm rivalry was not so pronounced as in U.P. And Bihar, and where the sugar mill industry was still growing in an expanding market. In Bombay, Walchand Hirachand and his family had built up a network of support in the rural areas and had succeeded in finding a berth in the provincial assembly. In Madras, the major sugar producing business house of Parry's had all along enjoyed governmental support. Therefore, in each sugar producing province a close nexus began to emerge in this way between the sugar producers and the provincial governments. However, the most important aspect of this process was the emergence of the Congress Party (and its leadership) as important participants in the political economy of the sugar mill industry. The complex bonds the Congress Party had forged with the peasantry - its electoral base - on the one hand and the miller, on the other, had imparted to Congress policy towards the sugar economy a certain complexity, the inherent

contradictions of which seem to have increasingly characterized its policy in the years to come. While the various provincial governments supported the sugar mill industry, the conflict between the mills of the different provinces, had not been resolved. The move was now made to bring all the sugar factories in India under some form of central governmental control. In February 1941 the idea of constituting a Central Sugar Advisory Board (CSAB) was mooted. The CSAB, it was proposed, would, '(a) advise governments of provinces and states about opening of new factories and shifting old ones; (b) co-ordinate arrangements for (the) marketing of sugar; (c) advise authorities on fixing sugar and cane prices; and (d) guide research on utilization of by-products' [see letter dated 28-1-1941, *Walchand Hira Chand Papers*, Nehru Memorial Museum and Library, WHC/NMML File No. 494, Part II]. This proposal to award these functions to the CSAB was not acceptable to the Deccan Sugar Factories Association (DSFA). Of function (a), DSFA was doubtful whether this might not after all stand in the way of the expansion of this industry in the Deccan. As for function (b), DSFA was against any all-India marketing organization since this would not serve the purpose of the Deccan factories. Thirdly, the Deccan factories had their own cane farms, hence cane pricing did not concern them. And finally, as for research on by-products, ICAR and Imperial Institute of Sugar Technology (IIST) were already set up to do those things. The DSFA sent to the secretary to the Government of India, Commerce Department a 'strong protest' about the move to constitute the CSAB under the inspiration of the ISS. However, despite this protest, the Government of India went ahead in November 1941 to constitute the CSAB. And to add insult to injury, no representative of DSFA was nominated to the CSAB though both ISMA and ISPA were represented on it.

An important factor behind such 'inter-regional' tension, which was in essence a tension between the established mills and the new firms in the industry, was the feeling among the established firms that any further expansion of the industry would adversely affect their profitability. This feeling, however, underwent a change when new investment opportunities opened up during and after the Second World War.

In March 1942, the Government of India decided to invoke the Defence of India Rules to effect controls on the prices of several commodities which were rising on account of the scarcities created by the War. In April 1942, sugar became the first commodity to be brought under control by the central government.

The Second World War

The War had a direct bearing on the growth of the sugar mill industry. For one thing the protection of the home market was now complete. Even the trickle of imports that had persisted after 1932 stopped abruptly in 1941-42 (sugar imports into India during the period 1939-40 to 1941-42 averaged 28,600 tonnes, constituting a bare 5 per cent of domestic output; this fell to an average of 20 tonnes during 1942-45). Though in quantitative terms sugar imports were not significant in 1935-40, the fact that Javanese sugar was available at the ports if domestic prices had risen sufficiently to make imports attractive, had always remained a deterrent to any excessive price escalation by the mills. However, the War gave total protection to the industry, and sugar prices registered a steep increase during 1939-41, inviting the control on prices in 1942. In the long term the impact of the War on the sugar mill industry was of an altogether different nature. While actual investment and industrial expansion in the war years was limited, Indian enterprise had become enthused by the potential investment prospects that were bound to open up with the end of hostilities. During the war years there was a significant expansion of output stimulated both by the decline in imports due to the disruption of world trade, and by wartime demand. This demand expansion was met through an expansion in capacity utilization rather than through any additions to capital stock.

The prospect of the British granting independence to India after the War and the new confidence of Indian enterprise gained through entering into multilateral business ventures, injected an air of entrepreneurial optimism which had a significant impact on the inter-group

equation within the sugar mill industry. Indian big business, which was eagerly waiting to diversify into new areas of activity, had increasingly lost interest in their traditional areas like cotton, jute, sugar and so on. The opportunity to diversify that both the War and the subsequent post-War boom offered, changed the entire equation between different regional business interests within the sugar mill industry. Confident of the fact that U.P. And Bihar based business houses were no longer interested in preventing their growth, owing to these new investment opportunities, the sugar manufacturers of the south and west Indian provinces and states became more confident of their prospects and less suspicious of any renewed attempts at a more planned growth for the sugar mill industry. This changed business climate made it possible for new mills to come up in the tropical region. In the period 1940-41 to 1947-48 there was, on the one hand, a decline in the number of mills operating in U.P. And Bihar (which came down from 102 in 1940-41 to 92 in 1947-48) and on the other, an increase in the number of mills operating in Madras, Bombay, and other Indian states like Mysore and Hyderabad, (from 31 in 1940-41 to 38 in 1947-48). The new thrust of the sugar industry into the tropical areas was accompanied by a renewed drive on the part of the government towards improving the quality of cane, not only in the tropical regions, but also in the traditional sugarcane growing provinces. The two policies were in fact linked. The renewed interest in improving the quality of cane in U.P. And Bihar was related to the need to make the industry there competitive with the newly emerging mills in the tropical region.

In 1943, the Indian Central Sugarcane Committee (ICSC) emerged as an extension of the erstwhile sugar sub-committee of ICAR. The functions of the ICSC were to be: 'To undertake the improvement and development of the growing, marketing and manufacture of sugarcane and its products in India and of all matters incidental thereto. This includes items such as agriculture, technological and economic research on sugarcane, gur, sugar and their by-products, the improvements of crop forecasting and statistics, the production and distribution and testing of improved varieties, the adoption of improved cultural practices, enquiries and recommendations relating to banking and transport facilities and transport routes, the maintenance of an Institute of Sugar Technology and other similar matters.... The committee will also advise the central and provincial governments concerned on any points which may be referred by them' [see Constitution of the ICSC, Resolution F. 41-24/43A, June 6, 1943, Department of Education, Health and Lands, Government of India, New Delhi, WHC/NMML File No. 140]. The ICSC, as constituted, was to have some 40 members or so: 12 representing the Government of India and the provinces, 3 nominated by the Governor General-in-Council, 9 representatives from the sugar industry, 8 representatives of the agricultural interests and 3 for the trade - the others included representatives of the khandsari and gur industries and technical experts. The representatives of the 'trade' were in fact also manufacturers of sugar (there was a close nexus between the manufacture and trade of sugar) so that de facto the representation of the sugar manufacturers on the committee (12) was equivalent to the representation given to the government itself. The finances for the committee came from the proceeds of the Sugar Excise Fund, which were not at the disposal of the ICSC, and an interest-free loan of Rs 11.75 lakh. ICAR's activities with respect to sugar were transferred to the ICSC and the work of IIST, Kanpur was also brought under its purview. Given its largeness, the ICSC conducted its business mainly through sub-committees appointed by the general body of the ICSC from time to time. There were seven such sub-committees: (1) Finance, (2) Technical, (3) Agricultural, (4) Experts, (5) Gur and Khandsari, (6) Local Affairs and (7) Sugar Standards. The most powerful of these sub-committees was the finance sub-committee, which was the 'principal executive body of the ICSC'. By intent or by chance, in 1946 ISMA found representation on all the sub-committees of the ICSC, with a two-thirds majority on the finance sub-committee. The industry's control of the finance sub-committee and of ICSC lasted till 1947-48 when, owing to the political changes that

had taken place, the representation of the agricultural, and *gur* and *khandsari* sectors was increased, and the industry's position in the ICSC was downgraded.

The changing character of the inter-regional relationship within the sugar industry is further illustrated by the attempt to formulate a five-year plan for the industry in 1945. A sub-committee, and the Planning Sub-Committee, was constituted in March 1945 within the ICSC. A sum of Rs 125 lakh was allotted to the sub-committee to enable it to implement its recommendation for the five-year planned-development of the industry. The Government of India requested the provincial governments and Indian states to send their proposals to the sub-committee in order to receive funds. The sub-committee was required to guide the main committee in two important directions: (a) what should be the main features of the future plan for the development of the sugarcane industry; and (b) how the special grant of Rs 125 lakh which the Government of India had placed with the committee for furthering sugarcane development should be distributed to the provinces and states in the light of the proposals and schemes received from them. The planning sub-committee made several recommendations on improving the data on sugarcane, improving the procurement and quality of cane, and making investment in land and so on. The main recommendations of the committee were, first, to encourage the growth of the industry outside U.P. And Bihar, and secondly, to improve the quality of the cane and reduce cost of Indian Sugar [ICSC, 1945]. The sub-committee recommended that: (a) in U.P. And Bihar no new sugar factories should be set up; (b) no factory of less than 300 tonnes capacity should be permitted to expand; (c) the attention of other sugar producing provinces and states might be drawn to the action of the governments of U.P. And Bihar in permitting all factories of capacity above 300 tonnes but below 800 tonnes to expand up to 800 tonnes; (d) there should be no expansion of existing factories above 800 tonnes [ICSC].

The strategy is clear. The big sugar units of U.P. And Bihar, owned as they were by the big business houses, sought to protect their markets by preventing any new factories from coming up.

Further, by preventing small and 'uneconomic' units from expanding their capacity through rule (b) they sought to increase their share of the expanding market. This line of thinking among the mill-owners is also reflected in the *Report of the Panel on Sugar, Alcohol and Food Yeast Industries*. The report regarded it 'necessary that there should be central government control over all important matters relating to the industry, though the actual marketing (of sugar) may be left to an organization of the industry itself, within the limits of governments instructions' [GOI, 1946].

In the period 1944-48 the size distribution of mills in U.P. And Bihar, as well as in other provinces and states, moved in favour of larger sized mills, with plants of less than 500 tonnes per day crushing capacity decreasing in number. The shift to larger capacity plants was, of course, also technology determined since new sugar mill machinery was trying to exploit greater economies of scale. Also, sugar mill owners were showing greater caution in importing machinery unlike the early pioneers.

For the sugar industry as a whole, the 1940s were a period of stagnation. Per capita consumption had not greatly increased, nor had the total output risen significantly. There was also no growth in the number of operating mills, though there was shift in the location of mills to new regions. Yet the 1940s were a momentous period. Wartime controls had brought stability to an industry that had experienced recurrent crises between 1936-40. The War had also afforded new investment opportunities, easing the tensions within the industry somewhat. It was also during this period that a long term all-India plan was first attempted. And for the first time ISMA emerged as the united spokesman of all the Indian sugar millers. The dominant were no longer regional capitalists, but part of the emergent national bourgeoisie.

Emergence of the Sugarcane Growers' Lobby

Though the 1940s saw the dissolution of the earlier contradiction between the millers of the various regions, another contradiction now came into focus, which was to become important to the sugar economy in subsequent decades: the conflict between the cane growers and the *gur* processors, on the one hand, and the sugar millers,

on the other. In 1947, on the eve of Independence, this conflict once again emerged as a central issue. The imminent transfer of power had yielded the peasantry a new power - a power that had previously been kept in check by the operation of the ISS but which had now to be squarely faced since most cane growers had a Member of Parliament to approach.

The ISMA moved a resolution at the meeting of the ICSC in June 1947 stating: The ICSC recommends to the government that the manufacture of *gur* and *khandsari* sugar be prohibited in factory areas. The idea was that this would force farmers to depend more on the mill sector and tackle the problem of the 'diversion' of cane (to *gur* and *khandsari*). It is important to note the very central role *gur* manufacture plays in the farmers' economy. Once the sugarcane reaches maturity every farmer would like to harvest and convert it into sugar or *gur*. Any delay in harvesting, or in crushing following the harvesting, reduces the sucrose content of the cane. This the farmer would wish to avoid. For the farmer, therefore, the conversion of cane into *gur*, when he is not sure that the mill would crush the cane, is a way of retaining the value of the cane in a preservable form. This is the only security the farmer has against the factory refusing to crush cane or delaying it. It is also an important means of earning the cash required in order to repay debts and purchase commodities. Therefore to prevent the manufacture of *gur* within factory areas under all circumstances, would have been a serious blow to the cane grower. As for *khandsari*, while local landlords and merchants operate units which manufacture *khandsari* sugar, such units are relatively few in number, and a ban on its manufacture could not have been a major consideration. Finally, banning *gur* and *khandsari* manufacture in factory areas would give the mill the monopsonistic power it always sought *vis-a-vis* the cane grower. Therefore, when this resolution was moved at the ICSC in 1947, the representatives of the cane growers, who largely represented the rich peasants' and landlords' interests, considered that it was the 'bounden duty of the ICSC to see that the interests of the sugarcane growers in India are safeguarded; and if this resolution is passed in the way it is proposed, the grower would completely be left at the mercy of the factory owners' [ICSC, 1947]. A similar controversy existed in Madras Province

and hundreds of growers had been prosecuted for manufacturing *gur* even after supplying their allotted quota of cane to the mills. Several members of the ICSC criticized the resolution, but by adding an additional clause to the resolution which said, 'It also recommends to the Government to see that the cultivator gets a *fair* price for his cane and that it (the cane) is not allowed to be left over by the factory except in cases of *force majeure*' [ICSC, 1947], and by agreeing to certain other modifications as well, and to the condition that this ban on *gur* manufacture initially be for a period of one year, it was ensured that this resolution was passed. There was a strong body of opinion, though as yet a minority opinion, within the ICSC which believed that the ICSC was functioning as an instrument of the mill owners and that it had neglected the interests of the cane growers. '(T)he ICSC hardly deserved its name.... Up to now, the industry had been made the centre of all developments and having planned that way, very little had been done to improve the lot of the agriculturists in India...' [ICSC, 1947].

The big farmers, who had clearly emerged as a politically powerful group thanks to the working of the electoral process and the growth of the nationalist leadership, well understood the implications of this newly acquired political clout. As producers of cane, they were questioning the rationale of a system that, in their perception, seemed to yield more surplus to the processor of the product than to those who were in fact 'producing' it. It was a question of how to divide up the economic surplus. This tirade unsettled the ICSC. While the resolution on *gur* was passed, the ICSC sought to appease cane growers by nominating their representative to the high-power sub-committee of the ICSC constituted in June 1947 to help and guide the ICSC in all matters of vital importance and in questions of high level policy. The growing size of the ICSC made it unwieldy and necessitated the formation of a sub-committee which met more frequently to transact its regular business. This high-power sub-committee was the *de facto* 'cabinet' of the ICSC.

However, August 1947 had altered this equation in favour of cane growers. With the declaration of Independence and the coming to power of a democratically elected government at the all-India level, and with the consequential dependence of the central and state governments on the

massive vote bank of the peasantry, government policy could no longer ignore the interests of the farmer. This was all the more reinforced by the fact that the landed gentry had direct access to ministerial power. The political party in power in the provinces was also now in power at the centre, so the latter was now more responsive than the imperial government to 'pressures from below'. All the above factors combined to more effectively give expression to the cane growers' interests. With full knowledge of this changing equation, a resolution was moved at the ICSC in February 1948 which recommended to the Government of India that 'the composition of the ICSC be varied so as to give a clear majority to the cane growers' representatives and to totally exclude the representation of the sugar trade' [ICSC, 1948]. This resolution was of course not adopted by the ICSC, given its membership structure at the time. However the representation given to the manufacturers of *gur* and *khandsari* was increased from four to eight - most *khandsari* manufacturers being landlords and not peasants.

In February 1949 the all-powerful finance sub-committee was reconstituted, reducing

ISMA's representation to two (out of ten) and increasing the representation for the *gur*, *khandsari* and cane growers to six. This recognition of the importance of the raw material producers - the cane growers - and the assertion of their economic and political power, was to form the basis for a new policy of licensing sugar mills in the cooperative sector.

IV. STATE POLICIES AND STRUCTURAL CHANGE IN THE SUGAR MILL INDUSTRY IN THE POST-INDEPENDENCE PERIOD

In analysing structural change in the sugar mill industry in the post-Independence period, three aspects need to be noted. First, the locational shift of the sugar mill industry from the sub-tropics to the tropics (that is, from the north Indian region to western and southern regions); secondly, the change in the pattern of ownership and control of the sugar mill industry; and finally, the changes in the size-distribution of the mills across the different capacity ranges which showed a general increase in the number of larger mills and a decline in the number of small mills.

TABLE 1. STATE SHARES IN SUGAR PRODUCTION, 1950-51 TO 1985-86

(Percentages)

Year	Sub-tropical			Tropical				
	U.P.	Bihar	Total*	Mahara-shtra and Gujarat	A.P.	Tamil Nadu	Karna-taka	Total*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1950-51	53.3	20.1	73.4	10.9	2.1	8.2	1.4	22.6
1955-56	53.1	17.2	70.3	10.5	7.3	2.9	3.1	23.6
1960-61	47.1	12.7	59.8	18.5	5.9	4.1	4.1	32.6
1965-66	38.8	10.5	49.3	23.7	8.5	6.3	4.4	42.9
1970-71	34.7	7.8	42.5	30.5	7.1	8.0	5.5	51.1
1975-76	27.3	4.2	31.5	40.4	7.6	4.3	8.4	60.7
1980-81	23.8	3.8	32.2	40.5	5.0	8.3	7.2	67.8
1985-86	23.5	3.6	32.5	34.1	5.8	11.6	7.2	67.5

Note: * The total is for the region as a whole and includes states not mentioned in this table.
Source: *Indian Sugar Year-Book* (various issues), ISMA.

Locational Shift of Sugar Mills

As suggested by Tables 1 and 2, in 1950-51 only about 22 per cent of the operating mills were situated in the southern and western Indian states of Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Gujarat. However, by 1980-81 their share went up to over 50 per cent. Similarly, in

1950-51 these states accounted for only 23 per cent of the sugar produced in India, while in 1980-81 they accounted for over 60 per cent of it. On the other hand, while U.P. And Bihar together accounted for 70 per cent of the sugar produced in 1950-51, by 1980-81 this declined to a mere 30 per cent.

TABLE 2. SECTORIZATION OF THE SUGAR MILL INDUSTRY 1950-51 AND 1985-86

(number of mills)

Sector	Year			Number of mills operating			
		U.P.	Bihar	Sub-tropical region	Mahara-shtra	Tropical region	All India
Joint Stock	1950-51	68	· 29	108	12	27	135
	1980-81	54	19	86	10	42	136
Public Sector	1950-51	-	-	-	-	2	2
	1980-81	18	11	29	-	5	34
Co-op Sector	1950-51	-	-	-	1	2	2
	1980-81	17	-	30	67	109	139
Total	1950-51	68	29	108	13	31	139
	1980-81	89	30	149	77	166	315
	1985-86	100	23	158	88	183	341

Source: *Cooperative Sugar Directory and Yearbook, 1987,* National Federation of Cooperative Sugar Factories (NFCSF) Ltd., New Delhi, 1987.

Within the sub-tropical region the states of Punjab, Haryana and western U.P. have registered an increase in both the number of mills and in the output of sugar, especially in the decade 1970-80, both on account of the spread of irrigation in these regions and of the increase of cooperative sugar factories. In western U.P. some of the older sugar manufacturing firms owned or controlled by big business houses also expanded their plant size and modernized their equipment during this period, resulting in an increase in sugar output and in higher productivity at the plant level. As a result, sugar output recorded a higher growth rate in western U.P. compared to eastern U.P. And Bihar. However, in the sub-tropical region as a whole, there has been a clear deterioration in both the quality of cane and the efficiency of the mills processing the cane. The mills in these regions have some of the highest costs and lowest efficiency in India. Many have been taken over by the state governments having turned 'sick' (some have in fact simply been closed down). Some are still very 'sick' and continue to operate only because the sugar they manufacture, however inefficiently, caters to the local demand in a regime of control or partial control. Second, once transport costs are added south and west Indian sugar may still be more expensive in the north than 'high-cost' north Indian sugar. The political pressure brought by the growers cultivating the cane also helps to keep these mills functioning. Even where private management has found it no longer profitable to operate sugar mills, the government has not hesitated to take over these mills and to operate them, rather than to allow

them to be closed. Closure would cause hardship to the cane growers who are often, in the sub-tropical belt, unable to switch the acreage under cane to an equally remunerative crop.

The locational shift of the sugar mill industry was partly an outcome of state policy and of the decision of the big business houses to expand into new areas of investment. The fresh private investment forthcoming after 1947 mainly went to the south and west, not only because the market in these regions was large, facilitating the entry of new mills, but also because it was better suited to the cultivation of cane. The Development Council for Sugar Industries (DCSI) set up by the Government of India in 1954 recommended that the location of the sugar mill industry be gradually shifted to the tropical region. This recommendation formed the basis of the government's licensing policy with respect to the new capacity to be created under the first and second Five Year Plans. Consequently, most of the new sugar mills commissioned in the 1950s and 1960s came up outside U.P. And Bihar.

Emergence of the Cooperative Sector

The second significant factor is the change in the structure of ownership and control in the sugar mill industry since Independence. In the pre-Independence period the dominant business houses came to exercise considerable control over the sugar economy, both through the Indian Sugar Syndicate and through their access to governmental and semi-governmental bodies associated with sugar policy and the sugar mill industry,

despite the fact that no single business house dominated the sugar mill industry. Thus, at the time of Independence, as in most of the other major manufacturing industries, one clearly encounters the entrenchment of oligopolistic structures of control in the sugar economy. On the other hand, by the time of Independence the cane growers, especially the landlord and rich peasant classes, had become vocal and emboldened by the growth of the national movement and the formation of elected provincial governments.

During the First Plan period an important development occurred in the state of Bombay, which had far-reaching implications for the sugar mill industry and for sugar policy. Inspired by the success of the first major experiment in the co-operativization of industry, namely, the Big *Bagaitdars* (Pravara) Cooperative Sugar Factory in Bombay state, the provincial Government of Bombay announced that all new mills in the sugar mill industry would henceforth only be set up in the cooperative sector. The success of Pravara cooperative factory was due to the emergence of an agrarian class intent on asserting its economic power, now further consolidated with the emergence of a newly elected government, and to the dedicated effort of men like D.R. Gadgil and V.L. Mehta in promoting the concept of cooperatives. When the Pravara factory was set up in 1948 there was little protest from the private sector, but once it became clear that the government would only issue licences for new sugar mills to the cooperative sector, the Bombay-based business houses voiced strong protest. The opposition from the Bombay-based business houses to the co-operativization of the sugar mill industry had another important socio-political angle to it. Hitherto, most of the industry in Bombay was controlled by Parsi, Jain and Gujarati capital, with local Maratha capital remaining confined to non-industrial activities. The sugar cooperative, became an important vehicle for the transformation of the Maratha cane-growing community from that of a subordinate peasant community to becoming the dominant agrarian class. The landed Maratha families used the cooperatives to assert themselves *vis-a-vis* the metropolitan Parsi and Gujarati capital by preventing their entry into this lucrative new area. The constraint of capital, which initially shackled the Maratha landowning

class, was easily overcome through the financial support it secured from the state governments over which it had now considerable influence. Through this, it gained control over the cooperative credit societies. In A.P., Mysore and Madras, the newly elected state governments were facilitating the emergence of both a strong landlord and rich peasant class (who easily acquired control over the electoral process) and the emergence of the regional industrial capitalists, who in many instances were also landlords and/or rich peasants. In this way, the Reddys, Kammas, Chettiars, Gowdas, like the Marathas in Bombay, begin to enter the sugar mill industry through the institution of the sugar cooperative. They soon emerged as powerful regional capitalists. The various regional trends gave a great push to the policy of co-operativization of the sugar mill industry at the national level. However, the government also stressed the need for the already established private sector to be strengthened and re-established on the new foundation of modernized and rationalized mills.

The twin features of the new sugar policy were, therefore, the promotion of the cooperative sector on the one hand, and the modernization and rehabilitation of the existing private sector on the other. However, this did not rule out the licensing of new mills in the private sector, though these mills were always set up by regional entrepreneurial families or groups and rarely by any of the big business houses after 1947. The large business houses gained the financial assistance to rehabilitate and modernize their obsolete mills. The Government of India was concerned about the health of the ageing private sector mills in U.P. And Bihar and constituted the Committee on Rehabilitation and Modernization of Sugar Factories in India in 1965. This Committee recommended that 164 factories, mostly based in the sub-tropical region and private sector, needed to be expanded and their productivity and efficiency improved. To this end, it was advised that the government should create a fund from which soft loans could be given to deserving mills. It was calculated that nearly Rs 90 crore would be required to rehabilitate and modernize the sugar mills, of which two-thirds would be constituted

by contributions from the central and state governments and the remaining third by the beneficiaries (i.e., the mills) [GOI, 1965(a)].

The report of the Committee was received with hostility by the cooperative sector. Prof. Gadgil, the President of the National Federation of Cooperative Sugar Factories (NFCSF) Ltd., argued that the so-called 'sick' mills should be converted into cooperative mills so that the grower may develop a stake in cane and sugar development. Implicit in this suggestion was the notion that the private sugar mills had become 'sick' owing to the inadequate attention being paid to the improvement of cane quality in these regions, and on account of inadequate reinvestment in the modernization of the plants. Indeed, many plants were operating at extremely uneconomic levels of capacity. This clearly does point to irresponsible managerial policy on the millers part, who had mulcted both the mills and the farmers, drawing away the surplus product into other avenues of investment, and not reinvesting in improved sugar manufacture and cane cultivation. Gadgil, therefore, severely criticized the policy of reviving the sick mills using public money, suggesting that the sickness was caused by the shortsightedness and wrong policies of the mill owners themselves. The government could not take a similar view, given the kind of pressures that were brought upon it. Having yielded, as it were, to the pressures from the landlord and rich peasant groups through pursuing a vigorous policy of co-operativization, it could do little but compensate the big business houses by aiding their modernization. As a result, the government not only provided for the rehabilitation and modernization of the private sugar mills in U.P. And Bihar, but also discouraged the growth of the cooperative sector in these states as a way of ensuring them an adequate supply of cheap cane. It is obvious that the large-scale growth of cooperatives in U.P. And Bihar would have further accentuated the 'crisis' for the private sector mills. As a result of this policy, there emerged a complex structure of ownership and control, the like of which is rarely encountered in any other industry in India. There is a large cooperative sector, based mostly in the western and southern Indian states; a sizeable private sector, based mostly in U.P. And Bihar, and controlled by the

big business houses; and there are the large modern mills of the newly emergent regional capitalists spread across the country. There is also the public sector, comprising some very efficient mills, but consisting mostly of sick mills taken over by the state governments in U.P. And Bihar.

While it is true that the cooperative sugar mills were initially provided with leadership from well-intentioned, idealistic and dedicated persons who perceived cooperatives as an institution through which rural development could be achieved over time, these cooperatives have become vehicles of enrichment for the rich peasants and landlord classes. The vested interests of the landlord and rich peasant classes in the cooperatives led to concentration of control in the hands of the big farmers. Despite increase in the membership of cooperative sugar factories their control has become increasingly concentrated. The institution of the cooperative sugar factory today represents the rising economic power of the landlord-rich peasant class in this country. The composition of sugar cooperatives does vary from region to region. For example, in Maharashtra the board of management of a sugar cooperative is an elected board and directly represents the controlling groups within that cooperative, whereas in Andhra Pradesh cooperatives have only nominated boards (only recently attempts have begun in A.P. to emulate the Maharashtra model). However, since it is the state government that nominates these boards, the locally powerful groups can expect to have their nominees nominated to the board and hence exercise control indirectly. One thing that all the sugar cooperatives have in common is the dominance of the landlord-rich peasant interests. Both politically and economically the cooperatives are not truly cooperative institutions of all the 'growers'.

Leadership and Control

The control of the sugar cooperatives has become a means of acquiring political power for the landlord and rich peasant classes. The acquisition of such political power has allowed them to secure control over economic assets such as sugar cooperatives. This is a two-way relationship, central to which is the control of sugar

cooperatives themselves. Further, they have become an important source of funds for the political leadership in these areas. It is perhaps possible to view the growers who control cooperative sugar factories as belonging to a rural 'elite', to a particular caste and even to a faction within that caste. However, what appears to be common to all these classifications is the basic underlying feature of differentiation in cooperative factory membership in the ownership and control over land. For example, in a cooperative sugar factory in Andhra Pradesh, the total number of growers supplying cane to the factory never exceeded a third of the total membership. This would imply that a large number of growers either do not supply cane, or do so through more 'influential' members of the cooperative, who may help them in the prompt scheduling of cane crushing, early payment, and so on. Such a phenomenon is now widely recognized as taking place and accounts for the very high prices cooperative sugar factories are paying for the cane. The members who effectively control the factory channelize this cane in their name, pay a lower price to the actual grower and siphon off the surplus. Diverse *instruments* of control and subjugation are probably used to make this possible, given the dominant position of the landlords and kulaks in the credit, product and land markets.

Therefore, the control of cooperative sugar factories by their more economically powerful members is a real phenomenon. Such control is direct where cooperative societies are managed by elected bodies, and indirect when they are managed by nominated bodies. In both instance, however, it is the socio-economically dominant classes that assert themselves. Further, sugarcane growers, especially the landlord-rich peasant class, influence government policy through being directly involved in the process of government as ministers and party leaders.

Financing the Cooperatives: the Role of the Government

In referring to the 'control' of the cooperative by landlords or rich peasants, it must be recognized that such households may not in fact *own* a major number of shares in the cooperative they control. Their ability to control the cooperative is based on their local political clout. It is therefore useful to draw a distinction between ownership and control, the later being more important. The modern corporation is controlled by groups which may own barely 5 per cent of the shares. The same is true of the cooperatives. They are institutions in which a large percentage of the shares are actually owned by the state government and other financial institutions, while a small group of influential members is able to control the management of the mills. The cooperative sector first received government support with the Government of India's decision to mainly license sugar mills in the cooperative sector. Further support ranged from access to easy finance and credit, to investment in cane development, and so on. The most important support came in the form of financial backing. The early experiments with the co-operativization of the sugar mill industry were genuinely broad-based, in the sense that a large number of growers actually contributed the share capital, by the 'small deposits of small farmers' [Gadgil, 1975].

In the 1960s, the increase in project costs contributed to the increasing dependence of cooperatives on public funds. The expansion in the size of the optimum plant and the tendency to favour large-sized mills contributed to this. On the other hand, the number of growers each cooperative society could enlist as members was limited by the distance to which a mill could effectively spread out in search of cane (this distance being restricted by the problem of driage of cane and by the distribution of investable surplus within the hinterland of a factory). When the ceiling imposed on the ability of a mill to mobilize investable surpluses (because of these factors) fell below the liquidity requirements of the mill, it was only natural that it should approach the government and other financial institutions for support. Thus, the *necessity* to borrow funds from the state was balanced to a large extent by the *ability* of a group of influential landowners to secure the requisite funds. The growth of the cooperative banks and other development institutions helped make available the required funds in the countryside. As a result, it was no longer necessary to launch a mass movement among the peasantry to mobilize the capital to set up a

cooperative factory (as indeed, done in Bombay State in the 1940s and early 1950s) since cooperatives now had a very large measure of financial support from the government.

The Industrial Policy Resolution, 1956, spelt out in detail the role of public, private and cooperative sectors in the economy. It was considered that the sugar mill industry would be the appropriate industry for the development of the cooperative sector, hopefully with the help of state financial support. The Sugar Industry Enquiry Commission (SIEC) Report estimated that a cooperative sugar factory (of about 1,250 tonne daily crushing capacity) would cost in the 1960s about Rs 240 to Rs 255 lakh [GOI, 1974]. Because of inflation, it would cost about Rs 350 to Rs 360 lakh in 1973. Accordingly, the contribution of both grower and non-grower members and of the state government was increased to Rs 60 lakh each. The long-term and medium-term loans from the IFCI, LIC and the cooperative banks amounted to Rs 230 to 240 lakh [GOI, 1973]. While it is true that producer-members had to contribute only about one-sixth of the total capital cost of the sugar mill, it was difficult to raise even this amount from any given group of sugarcane growers, because, for any particular mill, the hinterland from which it could buy cane was limited, being fixed at not more than 20 to 25 km radius around the mill (ideally mills preferred a radius of 10 to 15 km) [NFCSF, 1966]. The contribution of the state governments and public financial institutions to the share capital of cooperative sugar factories (the long-term and medium-term loans from the Industrial Finance Corporation of India (IFCI), Life Insurance Corporation (LIC) and the cooperative banks) increased from Rs 6.5 crore in 1961 to Rs 25.6 crore in 1972. Ordinarily, the state governments' share is on a 'matching basis', corresponding to the amounts raised by the members. But, the prescribed or agreed ratio, or proportion, is not always strictly adhered to. Any gap in the growers' share capital contribution is usually made good by the cooperative banks through medium-term loans. Given the problem of raising the required share capital from among the members, the Reserve Bank of India prepared a scheme under which cane growers could be given term

loans for the purchase of shares to the extent of 75 per cent of the value of the share. In other words, the actual capital raised from the savings or capital accumulation of the grower himself, was even less than that indicated by the share of the grower-members in the total share capital.

Once the cooperative mill begins operation, the grower members secure sizeable profits from the consumer by charging high cane prices (see Part VII for a discussion of the movement in cane prices). The grower-members are required to contribute a 'non-refundable deposit' as their share of the loan repayments made through the cooperative to the various financial institutions. It is obvious, however, that this 'deposit' can in fact be extracted from the consumers through an escalation of the sugar price, thereby passing on the high cane prices. In effect, therefore, the grower-members who have acquired control over the sugar cooperative are not only able to control this economic asset, but also acquire access to political patronage with very little investment on their own part. It is the support from the state, on the one hand, and this ability to pass on the cost of the loan repayment to the consumer, on the other, which has facilitated the emergence of what may be termed 'cooperative capitalism'.

Cane Growers and the Sugar Mills

The control of the cooperatives has allowed these rural land-owning classes to secure favourable prices, at least through much of the late 1960s and early 1970s. There is a difference, however, between the position of the cane growing landlord or rich peasant in an area dominated by cooperative factories, as in Maharashtra, and that in areas where the private sector mills predominate, such as U.P. The fact that the number of cultivators supplying cane to sugar mills with a crushing capacity of not more than 2,000 tonnes per day does not exceed 3,500 to 4,000 in Maharashtra - as opposed to 25,000 to 30,000 in Uttar Pradesh - is itself indicative of the nature of land distribution among cane cultivating households in these two regions, and of the economic background of the respective cane cultivating groups. In Uttar Pradesh, cane largely being small peasant's crop, the 'peasant-oriented'

political parties have given emphasis to the nationalization of the sugar mills. In 1967, when an important peasant leader from U.P. became the Chief Minister of the State, the state government set up a committee on the take-over of sugar mills. The committee submitted its report in June 1970, recommending that the, 'future of the sugar industry will have to be in the cooperative or public sector rather than in the existing pattern through the domination of private management' [Government of U.P., 1970]. The Report charged the 'national and regional capitalists' investing in the sugar mill industry with inadequate maintenance of their plants, the absence of any investment of surplus in modernization of the mills, and a 'lack of interest in the sugar industry and indifference to the development of better quality sugarcane and other essential inputs. ... There has been a diversion of resources outside the sugar industry' [Government of U.P., 1970]. The Report provides evidence to suggest that several firms which had not declared dividends to their shareholders during the period 1964-68, and which had made little investment in the sugar mills controlled by them, had, on the other hand, sanctioned substantial loans to certain important shareholders without charging any interest. This suggests, the report argued, that there was a diversion of funds from the sugar mill industry to other activities by the owners of these mills, with disastrous consequences for the mills and the cane growers.

Interestingly, the Committee made it very clear that it was not advocating the nationalization of all industry, but merely recommending the state take-over of the sugar mill industry in U.P. It was not an ideological commitment to nationalization that motivated their demand, but a commitment to the acquisition of control over the sugar mill industry, and that too, by the 'growers'. The state take-over was only the means to an end, this end being the transfer of control of these mills to the upper sections of the peasantry. This was implicit in the strategy advocated by the committee, which recommended that once the mills were taken over by the state government they could be converted into cooperatives through selling shares to the cane growers. Any such floating of shares, with the small and medium peasants simply not being

able to mobilize the necessary funds, would ultimately lead to the transfer of shares from the business houses, and their share-holders, to the landlords and rich peasants. The recommendations of the U.P. Committee invited strong protest from the mill owners, especially the ISMA leadership, who questioned the legality of the state government taking over private mills. Urging the central government to intervene, ISMA argued that the working of the cooperative and public sector mills was no better than the private mills and that joint-stock mills would in fact perform better, if all controls were removed by the government. The Government of India decided to refer the subject of the nationalization of the sugar mill industry to the SIEC in 1972. There was no consensus within the SIEC on this subject. The representatives of the growers and agricultural labour argued in favour of nationalization, while those from the private mills strongly objected to it. Two separate notes were written on the subject, one by ISMA and the other by NFCSF, Ltd. The first note argued that the problems confronting the sugar mill industry in India were found in all the three sectors: public, private and cooperative; hence there was no justification whatsoever for the nationalization of the private sector alone; co-operativization would lead to an increase in the price of cane, and given then existing structure of the sugar cooperative sector, the 'rural oligarchy' alone would benefit and neither the small and middle peasants nor the labourers and consumers. The second note by the NFCSF, Ltd., recommended the nationalization of the, 'entire private sector industry, other than the cooperative sugar factories', that is take-over of 'sick-mills' but not wholesale nationalization [GOI, 1974, Pp. 109-142]. It also recommended the nationalization of the wholesale trade in sugar and the adequate representation of workers and growers on the boards of the nationalized and cooperative factories.

This ascendancy of the cane growing landlord and rich peasant classes has, of course, not been an unchallenged process. Indeed, the rejection of wholesale nationalization is itself an indication of this. The private sector had also sought to insulate itself from this trend. What had come to stay was this dual structure of the sugar mill industry.

There had been a relative weakening of the position of the pioneers, among them the Indian big business groups. The growth of the 'peasant' dominated cooperatives outside U.P. And Bihar has directly, weakened the influence of the U.P. And Bihar based business houses. Indirectly, it emboldened the peasantry in U.P. And Bihar to secure better terms of trade from the sugar mills.

V. SCALE, PROFITABILITY AND DIVERSIFICATION IN THE SUGAR MILL INDUSTRY

An important aspect of structural change in the sugar mill industry has been the change in the size-distribution pattern in favour of larger mills. It is useful to distinguish between three categories or units of size. The first is the *plant*, which comprises a single production process beginning with the crushing of cane and ending with the manufacture of white crystal sugar. Plant capacity refers to the capacity of a given production line to crush a given amount of cane in a working day. The second is the *mill*, which may consist of more than one plant, say, two or three plants assembled in separate sheds within a given premises. The third concept is that of *firm*, a business enterprise which may comprise one or more mills each located in different places. The discussion of the economies of scale refers to all three levels but mainly to the plant and mill level economies and, only briefly, to firm level economies - which are essentially managerial, organizational and financial in nature. Purely technical or engineering economies of scale are relevant only at the plant and mill level. Also, there is an important distinction between the potential economies of scale and those *actually* realized. Even when a case exists for the expansion of mill or plant size, this may not actually occur due to a variety of countervailing tendencies.

Economies of Scale

It is common postulate of the theory of the firm and the theory of costs, that economies of scale are derived from the reduction in the average costs through an increase in the scale of output. Two distinctions need to be made, however, in the characterization of economies of scale. The first, as already indicated, refers to the difference between firm and plant level economies. The second distinction, which applies both to firm level and plant level economies, is a distinction with reference to the unit of comparison, that is, whether one is making inter-temporal or cross-sectional comparisons of the economies of scale. An inter-temporal comparison would make an estimation of the changes in the average unit costs over time for the actual changes in plant or firm capacity. A cross sectional comparison would make an estimation of the average unit cost of production at a given point in time across the different firms or plants operating at different capacity levels.

Practical convenience apart, the latter method may be a more reliable way of measuring the economies of scale. Any assessment of the economies of scale is made with the proviso *ceteris paribus* - such a proviso cannot be expected to hold over time in dynamic industry, subject to technical change [Robinson, 1973, p. 338]. Apart from technical change, other factors, both internal and external to a firm or a plant, may also change. This being so, inter-temporal variations in the cost of production cannot simply be attributed to the changes in the scale of output.

Clearly, when identifying the sources of economies of scale and in measuring economies, it is important to consider the sources of the economies of scale at the firm and plant levels, and also to distinguish between the various types of industries. Important differences exist in the sources, extent, and implications of such economies of scale and in their relationship to market structure and control, technical change, and employment.

Economies of Scale in Sugar Manufacturing

Most Indian sugar mills operate with a standard specification plant with a daily cane crushing capacity of 1,250 tonnes. Even when a mill is stated to have 2,500 or 3,700 tonnes of cane per day (tcd.) capacity, it is normally operating with two or three standard plants. It is only recently that sugar technologists have argued in favour of larger capacity of about 2,500 tcd. for the standard

specification plant [Ramaiah, 1983]. Sugar manufacturers have also suggested that even for a 1,250 tcd. plant the standard specifications need to be altered, owing to changes in the design and fabrication of new sugar mills [GOI, 1981]. What sugar technologists and millers are therefore beginning to accept is that the 1,250 tcd. plant is no longer necessarily the 'minimum efficient size' plant, and that larger plants of about 2,500

tcd. capacity may be more efficient.

The discussion of scale, profitability and unit costs (and data in Tables 3 and 6) relates to sugar mills and not plants. Capacity expansion has typically come in the form of an increase in mill capacity through additional plants being installed, rather than through an expansion of the plant size itself.

TABLE 3. COST OF PRODUCTION AND SIZE OF MILLS 1976.

Daily Cane Crushing Capacity (tonnes per days)	Cost of Production per quintal			
	Low cost (Rs 162-169)	Medium cost (Rs 175)	High cost (Rs 182)	Total
Low capacity				
0-499	-	-	4	4
500-749	-	1	3	4
750-999	4^A	1	9	14
Medium capacity				
1,000-1,249	6^A	8	15	29
1,250-1,499	43	8	10^B	61
Large capacity				
1,500-1,999	23	9^B	6^C	38
2,000-2,999	28	3^B	2^C	33
3,000 and above	24	-	-	24
Total	128	30	49	207

Notes: The classification of mills into medium and low cost units is based on BICP classification. The 207 classified mills are operating in the states of U.P., Bihar, Maharashtra, A.P. And Tamil Nadu.
A = all old mills based in Maharashtra; B = Mostly situated Bihar and Eastern U.P. And C = All situated in Bihar and Eastern U.P.
Sources: Data collected from *List of Sugar Mills in India*, ISMA, 1978 and *Bureau of Industrial Costs and Prices (BICP) Report on Sugar, 1976* (mimeo).

TABLE 4. FREQUENCY DISTRIBUTION OF CANE CRUSHING CAPACITY 1948 TO 1980

Cane Crushing Capacity (tonnes per day)	1948		1963-64		1980	
	(1)	(%)	(2)	(%)	(3)	(%)
0-499	27	(17.3)	10	(5.3)	6	(1.9)
500-749	32	(20.5)	17	(9.0)	8	(2.6)
750-999	57	(36.5)	46	(24.5)	21	(6.8)
1,000-1,249	12	(9.1)	71	(37.8)	60	(19.5)
1,250-1,499	15	(9.6)	17	(9.0)	133	(36.7)
1,500-1,999	7	(4.5)	15	(8.0)	35	(11.3)
2,000-2,999	3	(2.0)	7	(3.7)	37	(12.0)
3,000 & ABOVE	-	-	5	(2.7)	28	(9.2)
Total	156	(100.0)	188	(100.0)	308	(100.0)

Sources: Column 1: M.M. Mehta, *Structure of Indian Industries*, Bombay, 1955; Column 2: *Report of the Committee on Rehabilitation and Modernization of Sugar Factories in India*, GOI, 1965; Column 3: *Cooperative Sugar Directory and Year Book*, NFCSF, New Delhi, 1981.

The minimum efficient scale (m.e.s.) Plant, or even the m.e.s. Mill size, is not very large in the Indian sugar industry - at least, not large enough to erect entry barriers. For instance, a mill with 5,000 tcd. capacity (single or multiple plants) can produce 0.75 lakh tonnes of sugar over a sugar season spanning 150 days. Assuming that the recovery per cent of cane is 10 per cent, the daily sugar production would be 500 tonnes. For most of the early 1980s this would constitute barely one per cent of the total annual output.

An important determinant of mill size in the sugar industry is access to raw material. Sugar mills operate within two kinds of cane-supply environments. The first, where cane is already being cultivated and where mills have come up because of an assured availability of cane (typically, this is the case of U.P.) And the second where cane cultivation is in fact encouraged and planned in order to set up a sugar mill (typically, this is the case in much of the tropical region). In the first case, the mill encounters a given structure of cane cultivation and is unable to alter it significantly, whereas in the second case a mill may in fact be actively associated with the planting, the choice of cane and the harvesting of the crop.

TABLE 5. SECTOR-WISE SIZE DISTRIBUTION OF SUGAR MILLS IN MAJOR SUGAR PRODUCING STATES 1980

(no. of mills)

State/Sector	1-1,000	1,001-1,500	1,501-2,000	2,001-3,000	3,001 & above	Total (tonnes/day)
Uttar Pradesh						
Cooperative	1	19	-	-	-	20
Private	7	20	9	9	9	54
State	12	2	1	1	-	16
Bihar						
Private	4	9	6	-	-	19
State	5	3	-	-	-	8
Punjab						
Cooperative	2	2	-	1	-	5
Private	1	2	-	-	-	3
Haryana						
Cooperative	-	2	2	-	-	4
Private	-	-	-	-	1	1
Gujarat						
Cooperative	-	10	1	1	2	14
Maharashtra						
Cooperative	2	44	9	6	8	69
Private	1	5	2	2	-	10
Tamil Nadu						
Cooperative	-	5	3	2	-	10
Private	1	6	1	1	3	12
Andhra Pradesh						
Cooperative	1	9	4	-	-	14
Private	3	2	-	1	3	9
State*	-	2	-	1	1	4
Karnataka						
Cooperative	-	11	-	-	-	13
Private	1	2	1	3	3	10
Total						
Cooperative	6	93	19	10	12	140
Private	18	46	19	16	19	118
State	17	7	1	2	1	28
Total	41	146	39	28	32	288

Note: *The public sector mills in A.P. are not 'sick' mills taken over by the government as in U.P. And Bihar but mills of the Nizam Sugar Factory (NSF), Ltd. which was taken over from the Nizam of Hyderabad by the state government after Independence. The NSF commissioned new mills in the 1970s.
Source: *Cooperative Sugar Directory and Yearbook, 1981*, New Delhi.

TABLE 6. SIZE AND PROFITABILITY IN THE SUGAR MILL INDUSTRY (JOINT-STOCK MILLS), 1968-69 TO 1980-81

Size (Daily Cane Crushing Capacity) (tonnes/day)	Profitability (Average Rate of Return on Total Capital Employed*)
0-1000	-2.9
1001-1499	8.8
1500-1999	11.5
2000-2999	12.6
Above 3000	16.3

Note: *The Bombay Stock Exchange Directory utilizes various concepts of profitability. The Table uses the more commonly used concept of Rate of Return on Total Capital Employed. The Tariff Commission, 1969 proposed that 12 per cent rate of return was 'reasonable'.
Source: Bombay Stock Exchange Directory, Vol. 15, (Sample of 15 mills from which data collected).

TABLE 7. AVERAGE RECOVERY OF ALL MILLS IN U.P. AND BIHAR AND SIZE OF MILLS, 1976-77 TO 1980-81

Mill Capacity	Recovery Percentages (Average for Season)
(tonnes per day)	(per cent)
0-1,100	8.5
1,101-2000	9.3
Above 2,000	9.9

Source: Cooperative Sugar Directory and Yearbook, 1981.

The location of sugar mills in the early years following the introduction of protection was unplanned, resulting in over-crowding. Such unplanned growth of the industry has imposed a constraint on the concerned mills preventing them from expanding mill capacity owing to the inadequacy of raw materials in a given hinterland. The lag between harvesting and crushing may be seen as a 'duration gap', comprising a 'distance gap' and a 'waiting gap'. The 'distance gap' is the distance between the farm and the mill that the cane has to travel before it is crushed. The longer the distance gap, the lower the potential recovery of cane. The 'waiting gap' is the time taken at the mill (at the gate, the weighbridge and at the plant) before the cane is actually crushed. The larger the duration gap, the lower would be the recovery per cent of cane and, consequently, the higher would be unit cane cost and conversion cost-that is, the total unit cost of production of sugar. The duration gap is a function of the cane availability (that is, cultivation) structure in the hinterland of a mill

and the cane requirements of that mill (that is, the crushing capacity of the mill). Thus, the structure of cane availability and the duration gap have an important influence on the size of the mills in any given region. In Table 3, the unit costs of production of sugar is a summation of unit cane cost and unit conversion cost (that is, manufacturing cost). If the mills indicated by the notation A, B and C (which refer to mills located mainly in Eastern U.P. And Bihar where unit costs are very high irrespective of scale) are ignored, then we get an interesting relationship between cost and capacity size. It is found that there is a clustering of mills in the high-cost-low-capacity box, in the 'medium-cost-medium-capacity box, and in the low-cost-large-capacity box. It is possible to postulate from this data an inverse relationship between size and unit costs o production, which points to the existence of economies of scale in the sugar industry.

Table 3 presents cross-sectional data. The trends over time reinforce the conclusion that the size distribution in the sugar mill industry has become more skewed over time. Table 4 suggests that the number of larger capacity mills has increased in the post-Independence period, with the first very large mills being set up after the mid-1960s. That this is related to the locational shift to the tropical region is indicated in Table 5, which gives the inter-regional distribution of mills according to size. Indeed, Table 5 taken in context of Table 3 suggests that at the margin, location may be more important than size in influencing unit-costs, since in Bihar and Eastern U.P. even larger size mills have high unit costs.

There is an explanation for this tendency in favour of larger capacity mills. First, unit costs are known to decline with capacity size. It can also be shown that the recovery per cent of cane also increases with size, as does the average profitability of a firm in terms of rate of return on capital employed. The data presented in Tables 6 and 7 point to a positive relationship between profitability, sucrose recovery rate (a measure of mill efficiency) and mill size. The data in Table 6 is firm level data, while that in Table 7 is mill

level data. However, these are broadly compa-
rable since the firms chosen for analysis are single
mill firms, so mill level and firm level data here
refers to the same sample.

In formulating Table 6, care has been taken to
pick only those firms which are essentially sugar
manufacturing firms and which do not produce
important by-products (other than bagasse and
molasses). It is not possible to secure information
with respect to sugar alone at the firm level, since
any sugar manufacturing firm necessarily utilizes
the most important by-product, namely,
molasses. Bagasse, in recent years, has also come
to be used as a raw material in the paper industry.
Hence, the profitability figures of even a sugar
manufacturing firm relates to a number of other
activities as well.

Further Table 6 also suffers from the weakness
that it has not been possible to eliminate the effects
of being a member of a large business house upon
a firm's profitability. For instance, a large busi-
ness house-controlled sugar mill may-show better
profitability results than a mill owned by a local
business group. On the other hand, if the said large
business house is utilizing one of its sugar mills
for the laundering of black money or for diverting
its surplus to other activities, it is perfectly pos-
sible to find such a firm exhibiting an unusually
low rate of return, irrespective of the mill's
efficiency and capacity size. Finally, the selection
has been restricted to those firms for which data
is available over an adequately long period of
time. Despite these restrictions, the relationship
between size and profitability is nevertheless
strongly evident.

A question that naturally arises from Table 6 is
why, if there is such a strong relationship between
the size of a mill and its profitability, does this not
reflect itself in a higher incidence of larger
capacity mills? Why are the potential economies
of scale not actually utilized? In fact, there are a
larger number of mills in the middle capacity
range of 1,250 to 1,500 tcd. An important
explanation for this phenomenon is to be found
in the problem of overcrowding. This is essen-
tially seen as a product of shortsightedness and
the unplanned growth of the mills, Thus, in certain

areas, where sugar mills have been set up in close
proximity to each other, the distance which a
miller has to go in order to buy cane is naturally
increased. Larger distances extend the 'duration
gap', thereby aggravating the problem of cane
driage and hence of the cane cost for the mills.
Therefore, if in a given region a group of sugar
mills expand their crushing capacity, assuming
that the cane availability in the hinterland of these
mills is limited, the mills would have to travel
longer distances in search of cane. Further, in a
large mill, the 'waiting gap' may also increase if
cane delivery schedules have not been properly
worked out and the cane growers are required to
wait after arriving at the factory gate before their
cane is weighed. There is no fixed optimum
duration gap for the country as a whole. In
agro-climatic regions where the cane quality, in
terms of sucrose content, is higher, the duration
gap may be longer. That is, a mill can go to greater
distances in search of cane. Apart from cane
quality, the yield per acre of cane also plays an
important role in specifying the duration gap. In
the tropical region, where cane yield per acre is
almost twice that in the sub-tropical region, a firm
can set up larger capacity mills since a mill can
secure a larger share of its total requirements from
within a specified radius. This would explain why
there are more large sized mills in the tropical
regions, as compared to the sub-tropical region.

Another factor that may have influenced the
choice of scale in the sugar mill industry is the
distribution of land among cane cultivating
households. Consider two sugar mills with equal
capacity: if one mill is confronted with a land-
distribution structure that requires it to buy cane
from 20,000 growers and another is required to
buy cane from only 4,000 growers, these two
identical mills (in terms of capacity and tech-
nology) may have different unit costs of pro-
duction. The former mill will not only have higher
managerial costs, but it will also have less control
on the cane quality and harvest schedules. This
could be another factor in discouraging the
growth of very large mills in regions where cane
cultivating households operate on small plots of
land (see part VII for data on the size-distribution

of operational holdings in different cane culti-
vating states). The Sugar Enquiry Commission,
1965 said: 'The economies of scale which result
from having large units and captive by-product
plants, are well known. These will, however, have
to be weighed against certain disadvantages
peculiar to an industry which depends on a raw
material that is perishable and is produced by a
large number of small farmers. A large-size fac-
tory of 2,000 tonnes or more would require an
area of nearly 20,000 acres to feed it in the
sub-tropical belt. Unless such an area consists of
big plantations or (is) distributed over a small
number of large-size farms, the above economies
may be offset to some extent by (the) increase in
cost of transport of cane from long distances and
greater driage of cane leading to loss in recovery.
In addition, sugarcane cultivation in small hold-
ings scattered widely would render intensive
development work by factories difficult' [GOI,
1965(b), P. 144].

The duration gap hypothesis is also supported
by the evidence on recovery rates presented in
Table 7, which shows a steeper increase in
recovery with an expansion in capacity from the
0-1,100 tcd. range to the 1,100-2000 tcd. range,
than that with expansion above the 2,000 tcd,
range. Finally, implication of the duration gap
hypothesis is that for any sugar manufacturing
firm, capacity expansion beyond the point dic-
tated by the duration gap would require a loca-
tional shift for the additional plant capacity. This
compulsion to make a locational shift - with all
its attendant problems of cane supply manage-
ment and so on - may offer another explanation
for the observed clustering of mills in the middle
capacity ranges.

While the above factors would explain to some
extent the current observed size-distribution of
mills, in more recent years, especially in the
tropical region, the tendency has actually been in
favour of big sugar mills. It has been reinforced
by the recent trend of utilizing the by-products,
like bagasse and molasses, for setting up large
paper and alcohol-based industries. In sum, while
significant mill level economies of scale do
operate in the sugar industry, such economies may

not always be exploited due to the specific his-
torical, institutional and locational barriers which
act as fetters to capacity expansion. Further, even
while technical economies of scale may exist,
they may not always be exploited due to the
managerial or financial diseconomies in specific
instances. Where a sugar manufacturing firm
finds itself incapable of exploiting such econo-
mies, or regards capacity expansion within the
sugar industry as unprofitable, it typically
chooses to diversify into new avenues of invest-
ment. Such diversification of activity can very
well be considered as one response to a firm's
inability to exploit the economies of scale.
Another response is to record the mill as 'sick;
and either close it down or invite state take-over.

Diversification and Modernization

Even in the pre-Independence period, particu-
larly during and immediately after World War II,
many of the older sugar firms began to diversify
into new avenues of activity. The growth of the
sugar mill industry in the tropical region during
the 1950s and 1960s (in particular, the growth of
the cooperative sector) once again exerted pres-
sure on the joint stock sugar mills in the sub-
tropical region to diversify, in order to hedge
against the instability of the market for sugar. The
response of the U.P. And Bihar mills is more
significant, since they were the worst affected by
the structural changes underway in the industry.
The following analysis of diversification is based
on a study of 33 mills located in U.P. And Bihar
which are owned or controlled by big business
houses. It does not refer to such mills as are owned
by regional or local entrepreneurs in these states.
An analysis of the information reveals three broad
strategies that have been pursued by the big
business houses. The first strategy was clearly to
both expand capacity and to modernize machin-
ery and equipment. The extent of expansion was
probably influenced by both the availability of
funds and of raw material. Such capacity expan-
sion has more often than not occurred through the
addition of new plant to existing plant. Only rarely
has it meant a complete replacement of the old

plant. The second strategy has been that of the diversification of the investment profile of the concerned business house, diversification being pursued both as the policy of a growing firm and as an insurance against otherwise uninsurable risk and uncertainty. Finally, in the Indian context, diversification has also to be seen as a business strategy of an Indian 'business house' which seeks to secure greater marketwise control spanning across several industries, rather than to acquire monopoly control in a single industry.

A business house or firm manufacturing a particular commodity may diversify into other areas even when its original activity is still profitable and it continues to operate in it. Alternatively, it may diversify precisely because its original activity is no longer profitable. However, it is the first type of diversification that is more likely, since only a profitable venture can generate resources for further investment. Also, the credit rating of a profitable firm allows it to acquire capital for its plans for diversification. Diversification itself can be of two types. The first type is related to the main area of activity. In the case of sugar, this strategy means entry into alcohol-based, bagasse-based, and sugar-based activity. The second type of diversification involves entry into totally new and unrelated areas. The first type of diversification is very common, though few mills have gone into confectionery and paper, with molasses-based and alcohol-based activities being more popular. It is only recently that bagasse-based paper mills have begun to be set up by the sugar mills. In the Indian context the second type of diversification is very common, given that investment decisions are rarely taken at the level of the firm and the relevant decision-making unit is the business group or family. Indian business houses are reputed for their strategy of spreading their investment thinly across several unrelated areas. Monopoly power in the Indian context is derived not so much from domination in one product, but from the acquisition of control across a wide range of products. Sugar, along with textiles, is one of the two industries from which almost all the major Indian business groups have emerged before moving

into other areas, such as vanaspati, soap, ice, oil mills, spirits and alcohol and distilleries, malt, malted milk, paper, chemicals, etc. One unit even stopping the manufacture of sugar altogether now produces a wide range of totally unrelated products like cement and spun pipes. If the business house is looked at as a whole, then *all* such houses which began with interests in sugar in the 1930s and 1940s have in fact diversified into a very wide range of products. This diversification has not only insulated them from the fluctuations in the performance of the sugar mills, but has also reduced the importance of the sugar mills in the overall performance of the business house. Thus, the disadvantages of age and location, which the original sugar mills of U.P. And Bihar faced, have been neutralized to some extent by the strategy of diversification both at the firm and the house level. Of those that continue in sugar, some have sought to insulate themselves from the duration gap problem by setting up their own cane farms.

From the sample of firms analysed two important points can be made. First, that firms have often preferred diversification to modernization or capacity expansion beyond the m.e.s. level. Secondly, that even where firms have chosen capacity expansion, they have not expanded much beyond the m.e.s. level of 1,250 to 1,500 tcd. Of the 35 mills listed, only seven mills have a daily capacity of more than 2,000 tonnes. This is attributable to the limits imposed by the duration gap on mill-level capacity expansion.

That firms have preferred diversification to modernization has received severe criticism from the local cane growers in U.P. Bihar. The Committee on Takeover of Sugar Mills, 1970, accused the business houses in U.P. of 'diverting resources' outside the sugar mill industry (and indeed outside the state of U.P.), 'instead of investing the same for renovation of or expansion of the sugar mills' [Government of U.P., 1970]. Further, when a sugar firm opts to move its investable resources out of sugar, an important consequence of diversification can be the 'sickness' of the sugar unit of the concerned business house. This can be seen as a strategy of siphoning

off the surpluses from one area of activity, which is seen as being chronically loss-making or constrained by low rates of profit, to another new area of activity with a higher rate of profit. As of 1983 as many as 35 of the 120 mills commissioned in U.P. And Bihar have been taken over by the respective state governments after being declared 'sick'. Such sick public sector units continue to operate at sub-optimal levels of efficiency, owing to pressure from local cane-growers.

In short, the firms have either modernized, or diversified with or without modernization. In some cases modernization and diversification have been accompanied by capacity expansion to varying degrees. In other parts of India similar trends are discernible. Most of the profitable sugar mills in the tropical region, have set up very large mills with over 3,000 tcd. And many of them have diversified their investment profile. Interestingly, even cooperative sugar factories have begun to see diversification as an important insurance against the instability in fortunes of the sugar industry.

VI CARTELS AND CONTROLS: OILGOPOLY, STATE INTERVENTION AND TECHNICAL CHANGE

Structural change in the sugar industries has, occurred, within a regime of extensive controls and regulation. For a greater part of the post-Independence period, sugar prices and distribution or sales have been subject to regulation and control. What is the motivating force of such structural change within a regime of price and sales controls? Why are firms motivated to modernize, when output prices are regulated by the government? In the context of a highly regulated, even if not fully controlled, industry and market (in the case of both cane and sugar) relationships between the market and the industrial structure are clearly more complex. Through imposing controls on sugar prices, by regulating its sales, and by specifying monthly quotas for each mill and so on, the government has, in fact, operated a cartel on behalf of the mills. Why the government has been forced to replace a cartel operated by the millers themselves, namely, the

ISS, with a state-sponsored cartel is a question that needs to be examined. Technical change has happened on account of a combination of two factors, competitive pressures of the market and administrative fiats.

From Cartel to Controls: The Decline of The Syndicate

Despite a change in the ISMA leadership in the closing years of the pre-Independence period, the ISS remained an organization of the U.P. And Bihar based business groups even immediately after Independence. In the first two sugar seasons after Independence the ISS utilized the prevailing atmosphere of scarcity to push up sugar prices. Since the bulk of Indian sugar came from the heartland of northern India, the steep increase in the price of sugar, from about Rs 23-0-0 per maund in 1946-47 to over Rs 37-0-0 in 1947-48, could not have been on account of any excess domestic demand arising as a consequence of the partition of India (Table 8). Two developments caused the increase in the price of sugar during this year. First, the Tariff Board's assurance of a continuation of tariff protection up to 1951; secondly, the prospect of exporting sugar to Pakistan bolstered speculative tendencies and created an artificial shortage of sugar.

In October 1948, the Sugar Commissioner issued a warning to the ISS against either hoarding stocks or any further escalation of sugar prices. This warning appears to have had only a mild effect on the mills and traders, since sugar prices dropped only marginally in 1948-49. The spurt in sugar prices in 1947-48, and the role of the ISS in generating speculative pressure, invited scrutiny from the Government of India, which then appointed a committee to examine the sugar price rise 1949 [GOI, 1949]. The government was convinced that the activities of the Syndicate would have adverse effects, both for sugar prices in general and for the prospects of what was as yet an infant mill sector in the tropical region, and so it withdrew recognition of the Syndicate in 1949.

TABLE 8. PRICE AND THE PRODUCTION OF SUGAR

Year	All India Produc-tion (in tonnes)	Average Annual Wholesale Prices (rupees, annas, pies)			
		Kanpur	Bombay	Calcutta	Madras
1946-47	9,01,100	22-03-03	21-06-05	23-07-0	24-01-8
1947-48	10,74,800	35-12-08	37-11-05	37-10-0	38-02-5
1948-49	10,07,600	32-09-06	34-05-11	35-01-4	34-15-8
1949-50	9,78,600	31-08-0	32-01-0	32-14-6	33-08-4
1950-51	11,00,500	33-10-0	34-9-10	35-15-1	36-1-8

Source: *Indian Sugar Industry, 1952-53 Annual*, p. xvii

The ISS was able to play a far more effective role in influencing the sugar market during the 1947-49 seasons than it ever did in the pre-Independence period. In 1937-38 the sugar market was far less concentrated than it was in 1947-49, and the dominant producers were still not very powerful. Earlier, the important breach between the two factions had weakened the ISS, but during the 1948-49 through the twin processes of concentration and centralization the dominant sugar manufacturing houses had acquired control over the market. Secondly, the newly emerging policy of the government in support of the demands of the cane growers and the growth of the mills in the western and southern regions, helped in uniting all the joint stock mills based in U.P. And Bihar (which effectively controlled the ISS). However, despite the greater unity within the Syndicate in 1947-49, the organization suffered from the inherent weaknesses like weak entry barriers and lack of product differentiation, and therefore, failed to prevent the growth of new firms, especially in the cooperative sector. Due to its extreme self-confidence, the Syndicate decided to push up sugar prices immediately after Independence. The government did not appreciate the attempts of the Syndicate to manipulate the market. In its report, the ITB also recommends that protection be withdrawn to the sugar mill industry altogether. The ITB argued that the continuance of protection over the previous 18 years has produced an attitude of complacency on the part of the government, the industry and the cultivator, who were meant to be responsible for the efficiency of the industry. In consequence, they had not taken sufficient steps to improve the overall efficiency of the industry so as to bring down its cost of production [ITB, 1950, Vol. 1].

In August 1949, the Government of U.P. issued a Sugar Stock Freezing order by which it took control of all the stocks in the factories. On 2 September 1949, the central government promulgated a similar order for all the sugar factories in India. Full control was imposed on the sugar mill industry, and sugar was procured by the government at fixed prices from the factories.

In banning the working of the Syndicate in 1950, the government had essentially acted in the interests of the vocal, and now politically influential, middle class consumer [ITB, 1950, Ch. XII]. In 1949-50, this newly emerging concern for the consumer and the desire to promote the cooperative sector within the sugar mill industry played no small role in the eventual withdrawal of recognition from the Syndicate and its closure even when it appeared internally most cohesive, and its leadership politically influential. The new ministry and bureaucracy were suspicious of a cartel dominated by a few business houses.

The entire First Plan period and almost half the Second Plan period were characterized by relative price stability and the absence of inflationary pressures in general. The inability of the sugar mills to push up prices, in conjunction with the pressure of competition emanating from the growing cooperative sector, put pressure on the mills to reduce costs through modernization and technological upgradation from the latter half of the 1950s onwards. The constitution of a committee on the modernization and rehabilitation of sugar mills in the early 1960s, must be viewed in this context [GOI, 1965(a)]. In this period, therefore, technical change was enforced by the absence of entry barriers, the cessation of the cartel, and the growth of a more efficient, lower

cost, mill sector in the tropical region. Even if the market is characterized by the existence of oligopolies, the constant pressure to expand market share is an important lever promoting technical change. Therefore, it is not difficult to see why in the 1950s the older joint stock mills were under pressure to modernize and expand capacity. However, in a situation of price controls and market segmentation where the individual mill had a sale quota specified by the government, the rivalry between firms and their struggle for expansion of market share got subdued.

Competition, Controls and Technical Change

Through most of the 1950s no controls on sugar prices were imposed, and despite this sugar prices remained more or less stable. The reintroduction of price and distribution controls in the 1960s may be attributed to several factors, like concern for the consumer, to protect the older, higher-cost mills from the 'competitive' pressures exerted by the lower cost mills of the tropical region. This pressure was not particularly important in the 1950s, but from the 1960s onwards it has become an important feature of the Indian sugar mill industry.

What the regime of control or partial control has meant is a market segmentation, or division, on the basis of the existing stated capacity of the mills. The government specifies, on the basis of its cost of production studies, a certain ex-factory value for sugar. In the regime of full control, this constituted the basis for calculating the final price of sugar, while in the regime of partial control it is only the 'levy' sugar price which is based on this estimate. In the regime of partial control, the government has not fixed an all-India price marked up against the highest recorded cost. Instead, it has specified regional cost-schedules and fixed the levy price for each region at a point which normally covers the cost of production of two-thirds of the mills, but which is below the cost of production of the highest-cost mills. This procedure has had two important results. First, it has exerted pressure on the highest-cost mills to cut costs and secondly, since the levy price is 'region specific' it offers protection to the mills in the sub-tropical region as a whole. Even this

'protection' is partial, however, to the extent that the government cannot simply raise sugar prices to accommodate all cost escalations at all points in time. There are limitations imposed through the competing fiscal obligations of the government, the interests of the consumer (especially true at election time) and so on, which restrain the government from fully protecting sugar mills from cost escalation. These 'built-in' objectives of government policy as it were, act as levers of 'competition', exercising pressure on the mills to modernize and reduce unit costs even within the control or a partial control regime.

The government operated regime of controls is in many respects similar to a cartel. For even within a cartel, while member mills are protected through a cost-plus pricing system, constant battles are waged among these mills for a share of the expanding market and constitute the basis for technical change. Thus, while the pace of technical change may be subdued, it is by no means absent in a cartelized industry. Similarly, even in an industry subject to extensive government controls or regulation, the pressures in favour of technical change do operate - albeit with less force and success. While a purely miller-organized cartel is interested in protecting the interests of its members alone (having a single purpose), a government-operated cartel has to meet several, varied and probably contradictory objectives. While the 'cost-plus-mark-up' pricing policy and the market segmentation associated with a government cartel aim to protect the interests of the millers, the controlled or regulated price and distribution system are supposed to protect the urban consumers' interests. These twin goals of a control or partial control regime come into conflict only when the notional 'fair' price that millers seek, or at least some millers seek, is far above the notional 'fair' price that consumers are willing to pay. While a tension between the two is inherent to the situation, it is exacerbated in the seasons when there is a sugar shortage and an upward pressure exercised upon sugar prices. When such pressures arise, not on account of an excess demand but on account of pressures from the sugar millers, or on account of pressures from the cane growers, the government is forced to intervene on behalf of one or other of

the contending groups.

An escalation of cane costs can be expected to invite demands from the millers, who seek to protect their profit margins through an escalation of the administered price of sugar - this is mainly true of the private sector mills but not as true in the case of the cooperative or public sector mills. If the government is unable to fulfil such demands or does so only partially, then the sugar mills, facing the prospect of higher cane costs, are thereby forced to reduce conversion costs. If, however, cane cost escalation is only a seasonal problem, the pressure in favour of conversion cost reduction may not be as great as when the increase was a long-term phenomenon. Cane cost escalation has been a long-term trend throughout the 1960s and 1970s. Therefore, even within a regime of control or partial control, pressures are exerted in favour of indigenous technical change through the need to reduce the conversion costs of sugar. In the first decade after Independence (following the dissolution of the Syndicate) the pressure of competition from the new mills in the tropical region constituted the single most important, albeit weak and limited, source of technical change within the sugar mill industry. In the subsequent period, through the 1960s and 1970s, with the price and distribution of sugar controlled, motivation came from pressure from the government, which was unable to pass on all the cost escalations to the consumer, and which therefore forced the mills to cut costs through modernization and technological improvement (an important source of such cost escalation, was the increasing cane price).

Cartels, Controls And Crises

After having encouraged the growth of the cooperative sector, and thereby ignoring the demands of the joint stock mills, the government intervened in the latter's interest in order to operate this cartel-like price control regime. The imposition of price controls and market segmentation through specified sales quotas was seen by the government as a way of appeasing these private sector mills, which were opposed to the growth of the sugar cooperatives. The controls

on sugar price and sales have remained in operation often due to conflicting pressures and therefore to meet conflicting objectives. Instability is reinforced by the fact that the government has to fulfil not only the interests of those who constitute the cartel, but also those with whom the cartel is dealing, namely, the suppliers of the raw material and the consumers of the final product. The experience of the 1978-79 crisis illustrates this complexity very well [Baru, 1980]. The high-cost joint stock mills of U.P. And Bihar, demanded the continuation of controls in the fear that a bumper cane crop would push sugar prices down to uneconomic levels. Likewise, the lower cost mills in the cooperative sector, especially those based in Maharashtra, demanded decontrol precisely for this same reason - they hoped that a price war would eliminate the higher cost mills and increase their own market share. The government tilted in favour of decontrol, not so much due to the success of the lower cost millers, as because of the ideological predilections of the then Prime and the Finance Minister who favoured decontrol of all commodity prices. Even the system of regulated monthly releases onto the open market was dispensed with for the first time in over two decades. For a period of six months after the controls were removed - which happened in July 1978 - sugar prices fell under pressure of excess supply and the expectations of another good crop year. It was only when prices had fallen to levels that even the Maharashtra mills felt were dangerously low, that they were willing to join hands with the ISMA in forming a millers' cartel, much like the old Syndicate, which was to fix mill sales quotas and a floor price below which sugar prices were not a allowed to fall. The cartel arrangement, called the Voluntary Distribution Control, lasted from February 1979 till 4 June 1979, at which time the government decided to restore the system of an official monthly regulated release mechanism. This was done, it was at the time speculated, because of attempts to declare the cartel illegal under the provisions of the Monopolies and Restrictive Trade Practices Act. The Voluntary Distribution Control was simply converted into a compulsory distribution control under the legal aegis of the government - which is the way it was before the NFCSF decided to

wage a price war with ISMA.

There were several interesting aspects to this episode. ISMA, which was capable of operating as an all-India cartel just a few decades before, was now unable to successfully influence either the mill sector as a whole or the government. This was entirely due to the NFCSF decision to take a very strong position in favour of decontrol, and that the mills in the cooperative sector now accounted for more than fifty per cent of the total output. On the other hand, that ISMA did have some remaining influence is illustrated by the fact that when the industry decided to enter into a voluntary distribution control arrangement, it was ISMA which was asked to operate the cartel, with the ISMA President, acting as the chairman of the steering committee which was to administer the cartel arrangement.

The nature of the conflict between the ISMA and NFCSF mills was not as simple as it seems, however. Both sectors comprise high and low cost mills. But the leadership of ISMA, in general, reflects the interests of the 'high cost' mills, simply because such mills happen to be of greater importance within ISMA, owned as they are by the big business groups, while the NFCSF, though an all-India body of cooperative sugar mills, is essentially dominated by the so-called 'sugar lobby' in Maharashtra, and therefore normally represents the interests of these 'lower cost' mills. A few dominant business houses provided the leadership to ISMA and the Syndicate on the basis that they controlled a large share of the total output of sugar. Their collective ability to influence the price of the commodity, and to exercise tremendous clout within the industrial economy of the country as a whole, allowed them to dominate and discipline the sugar market. It is this group which found its influence increasingly atrophied with the growth of the cooperative sector. However, the emergence of the cooperative sector did not facilitate the emergence of a new 'leadership' capable of asserting its authority vis-à-vis the big business houses. This was inevitable given the nature of ownership and control within the cooperative sector. The only centre of authority within the cooperative sector comprised the elected leadership of the NFCSF. Congress Party leaders emerged as leaders of the cooperative

sector by virtue of their political power, and not necessarily on the basis of their stake in the sugar mill industry. It may have been for this reason that the market control of sugar was mediated through the intervention of the state - a state which was in an administrative and political sense amenable to the so-called 'sugar barons'. So, the Syndicate welcomed state intervention because it protected their mills from the ravages of competition with the lower cost, tropical, and cooperative sector mills. While on the other hand, the latter welcomed state intervention because it was through the mediation of the state that the leadership of the cooperative sector exercised its influence and control within the sugar mill industry. State intervention had become a means of exercising control, of operating a cartel, and managing crises. It is fair to suggest that the government operated cartel-like arrangement is really a mechanism of maintaining stability in an industry where there is rapid structural change. This pace of change is being tempered by the government, under pressure from various lobbies.

VII. THE POLITICAL ECONOMY OF PRICE FORMATION AND STRUCTURAL CHANGES IN THE SUGARCANE ECONOMY

There are important inter-regional, inter-sector and inter-class differences in the process of the formation of the price offered for cane by the sugar mill industry. The cane grower in India encounters three different market situations: the first is the 'unorganised' or 'unregulated' market, which is the market in which cane is sold to the gur or khandsari producers; the second is the market provided by the private sector mills, and the third is provided by the cooperative mills. In each of these markets a different price for cane may prevail. The process by which these different prices are determined also varies.

In the 'unorganised' market, the price more or less reflects the current supply and demand situation. In general, this price tends to be the lowest of the three market situations, except in seasons of sugar shortage, when the 'free' price of cane rises faster than the 'controlled' price. In the case of the cooperative sector mill, the tendency is to offer prices which are higher than the Statutory Minimum Price for cane (SMP), as fixed by the Government of India. If the price offered by the gur producers constitutes a notional floor to the

cane price, the price offered by the cooperative sugar mills constitutes the ceiling. In general, the private sector mills tend to pay only the SMP or State Advised Price (SAP) and rarely do they offer a higher price.

Early Trends in Cane Pricing

Until 1950 the Statutory Minimum Price for Cane (SMP) was fixed only in certain cane growing states, and that too was established separately for each state by the respective state government. It is not surprising, therefore, to encounter inter-regional variations in the price fixed for cane. While these variations partly reflect inter-regional differences in cane quality and cost of production, they also reflect the presence in certain provinces, or the absence in others, of a policy of a minimum price for cane.

In 1950, the Tariff Board suggested that uniform prices be determined for the entire country. The government acquired the powers to do so through the Sugar and *Gur* Control Order, 1950 [GOI, 1974, p. 167]. Under this order the cane SMP was initially fixed purely on weight basis and not in terms of cane quality (or sucrose content). In 1955 a modified Sugarcane Control Order was passed, which stipulated that the minimum price for cane payable by white sugar mills be determined with respect to the following factors: '(a) the cost of production of sugarcane, (b) the return to the grower from alternative crops and the general trend of prices of other agricultural commodities, (c) a fair price of sugar for the consumer, (d) the price at which sugar produced from cane is sold by producers of sugar, and (e) the recovery of sugar from cane'. The Sugarcane (Control) Order, 1955, thus introduced the principle of 'rational procedure' in the determination of the cane price payable by sugar mills. Further, it also recommended an explicit linking up of the cane price to the cane quality in terms of the recovery percentage of the cane [Tariff Commission, 1961].

It was not until 1962-63, however, that the minimum price for cane was actually fixed with respect to its quality. Through most of the 1950s (1952-53 to 1958-59), the SMP did not vary perceptibly. However, during this period there

continued to be inter-regional variations in the price of cane and in some states special formulae were developed to link its price to that of sugar. For instance, in 1952-53 the Government of Madras introduced the South Indian Sugar Mills' Association (SISMA) formula, which sought to 'pass on to the growers a portion of the benefit of higher sugar prices realised by the factories' [Tariff Commission, 1961]. The additional cane price was paid over and above the minimum cane price, so that the proportionate share of the sugar price awarded to the cane grower increased with the price of sugar. In 1953-54 the growers in U.P. And Bihar demanded that the mills in these states also adopt the SISMA formula. After a lot of resistance, the mills agreed to a revised version of the SISMA formula under pressure from the Government of India. The basic principle of the formula adopted in U.P. And Bihar was that the growers supplying cane to a sugar mill should share with the mill the net sugar price realised by it during a year, in the same ratio as the cost of the cane bears to the mill's cost of production of sugar during that year.

The revised formula stated

$$C = \frac{X}{100} \cdot \frac{P - (t \pm d + 0.01s)}{Y}$$

where C = Additional Cane Price; X = growers' percentage share of the net amount realised by a factory from the sale of one tonne of sugar, i.e., of the average price realised, after deduction of excise duty, direct taxes on mills, selling agency commission, etc.; Y = sugar recovery from cane; P = Average price of sugar per maund realised by a mill and adjusted to ISS grade E27; t = taxes paid by the mill; d = the difference between the cost of manufacture of sugar of a factory and the region as a whole, on account of the differences in duration of season and recovery; and 0.01s = one per cent of the sales commission(s) paid by mill.

In the 1953-54 sugar season, this formula was applied to the entire country in determining the additional realisation for cane growers over and above the statutory minimum price payable under the Sugar and *Gur* (Control) Order, 1950. The variable was separately determined for each region. The sugar mills were henceforth required to pay both the SMP for cane and an Additional

Cane Price (ACP). The price-linking formula had nothing to do with the cost of cultivation of cane, however. Its purpose was only to pass on a certain share of the sugar price to the raw material producer, on the assumption that both sugar quality and the cost of production are functions of the cane quality and the cost of cultivation. The principle of arriving at a cane price on the basis of the cost of cultivation and the quality of cane was not yet implemented, though in theory it had been accepted by the government in the Sugarcane (Control) Order, 1955. Till the early 1960s the SMP of cane was determined purely in terms of the value of gur (a competitor in the market for cane), and the value of competing crops. As a result, the concept of the 'additional cane price' did not automatically imply a cost-plus pricing of cane.

The concepts of price-linking and of an additional cane price can only hold true in the context of a free, or partially free, market. Since the price of sugar in a complete control regime is itself fixed

on the basis of the price of cane (the SMP), the question of an additional price of cane does not arise. Table 9 clearly shows how the actual price paid for cane was above the SMP for cane in the partial control period, of 1967-68 to 1973-74, and even in the control period of 1961-62 to 1966-67, both at an all-India level and in Maharashtra (for Uttar Pradesh, the difference is negligible). This, is essentially due to the differences in cane quality and due to the dominance of sugar cooperatives in Maharashtra. The reason why the actual prices rose so sharply above the SMP in 1967-68 and 1973-74 can be attributed to a shortage of cane in the former year, and a change in the pricing procedure in the latter year. Only from the 1962-63 sugar season, the joint stock Sugar mills were explicitly required to pay a cane price that fully accounted for the cost of cultivation of the cane. The principle of cost-plus pricing of cane was formally accepted with the constitution of the Agricultural Prices Commission (APC) in the mid-1960s.

TABLE 9. ACTUAL PRICES PAID AND MINIMUM CANE PRICE, 1961-62 TO 1973-74.

Season	All-India			Maharashtra			Uttar Pradesh		
	RR	SMP	AP	RR	SMP	AP	RR	SMP	AP
1961-62	9.8	4.34	4.53	12.0	4.34	5.15	9.3	4.34	4.37
1962-63	10.3	4.54	4.63	11.8	5.14	5.38	9.6	4.26	4.27
1963-64	10.0	5.09	5.63	11.8	5.46	6.32	9.5	4.89	5.47
1964-65	9.7	5.36	5.72	10.2	5.36	6.56	9.1	5.36	5.48
1965-66	9.7	5.36	5.72	11.4	5.36	6.71	9.0	5.36	5.39
1967-68	9.9	7.64	13.25	9.8	7.58	17.17	9.7	7.55	12.42
1968-69	9.5	7.91	10.08	9.7	7.53	11.80	8.9	7.37	9.13
1969-70	9.3	7.37	7.84	8.9	7.37	9.05	8.3	7.37	6.89
1970-71	9.3	7.64	8.46	9.8	7.37	10.37	8.9	7.37	7.56
1973-74	9.6	9.03	13.18	9.8	9.24	15.29	8.9	8.38	12.91

Note: RR-Recovery Rate; SMP-Statutory Minimum Cane Price; AP = Actual Price paid.
Source: Calculated from Annual Survey of Industries, (A.S.I.), Vol. II (various years) and APC Report on Sugarcane Price Policy (various years).

Linking Cane Price to Quality

For nearly a decade, from 1952-53 to 1961-62, the SMP of cane did not show any significant change. The cost of cultivation could not have remained so stable during this period. It is more likely that the upward pressure on cane prices, that became more manifest in the latter part of the post-Independence period (after the mid-1960s), was not yet an important phenomenon. From the beginning of the 1962-63 season the minimum price for cane was linked to a 9 per cent recovery

level. For every 0.1 per cent increase in the recovery level, the mills were required to pay a premium of four paise per quintal of cane. All the sugar mills did not necessarily adhere to this procedure in actually paying the growers. Even the Agricultural Prices Commission hinted at this in its report on price policy. 'An important weakness inherent in these methods of cane price determination is that the individual grower is not adequately rewarded or penalized, as the case may be, for the quality of cane he supplies to the mill because the procedures adopted to estimate cane

quality are highly aggregative and do not distinguish between the different producers of cane. ... At discrete intervals, ... the sucrose content of cane or its recovery percentage is calculated as: maund/kg of sugar produced by a mill, divided by the sugarcane purchased at the gate and at outstation centres, minus the quantity of cane lost in driage subject to a ceiling of 1 per cent on (the) sugarcane purchased at outstation centres' [APC, 1968]. Everyone is therefore paid at the average recovery level. While the grower suppliers as a whole would benefit if the average cane quality improves, this procedure does not provide any incentive to individual growers to improve the quality of cane. Such improvement is now possible only through a collective decision of the growers or by a planned intervention by the mill through its cane development agencies. In areas where several thousand farmers supply to a mill, as in most parts of northern India, particularly in U.P., such a system of collective decision making is not possible among growers, nor are the mills known to have any extensive or effective cane development agencies. Most of the cane development work is left to local government agencies, except in the case of a few forward looking mills. This disjunction between the agencies involved in the utilization of the cane and those involved in its qualitative development, has resulted in the rather slow progress of cane development [SISTA, 1983; GOI, 1974].

Another drawback of this system of cane quality determination and compensation, is that it links the price a grower-supplier secures for his cane to the mill's extraction efficiency, rather than to the inherent quality of the cane, since the sucrose content is calculated on the basis of the actual production in the mill and not on the basis of any experimental testing of cane quality. The Sugar Enquiry Commission [1965] noted that the National Sugar Institute, Kanpur, had evolved a method by which it was possible for mills to assess the quality of the individual grower's cane [GOI, 1965(b), Pp. 92-93].

In the period 1961 to 1966 (when sugar prices were mostly controlled) the actual price paid, on an average remained above the SMP at a given level of recovery. While mills were able to offer prices marginally higher than the SMP even under a regime of full control, they were quite clearly handicapped from competing with other processors of cane, such as the *gur* and *khandsari* manufacturers whose prices are not regulated. Indeed, this is an important drawback in the system of full control on sugar prices. This disadvantage the mills face particularly acutely in seasons of cane shortage. The steep decline in sugar production in the 1966-67 and 1967-68 seasons was largely on account of this inability of the mills to offer higher cane prices in the regime of control, these years being the trough of the cane output cycle. This is indicated by the fact that while cane output declined by about 25 per cent between 1965-66 and 1966-67, sugar output declined by nearly 40 per cent.

Another important drawback of the system of cane price determination was that it did not sufficiently penalize the growers of inferior quality of cane, i.e., with sucrose content less than the minimum with respect to which SMP was fixed. The specification of the minimum price of cane at such high levels of sugar recovery, as 9.0 per cent during the 1962-63 to 1963-64 period, at an even higher level of 10.34 per cent in the 1964-65 to 1965-66 period and 9.4 per cent until 1971-72, as also the calculation of the average recovery on the basis of the total cane crushed by the mill, did not encourage any improvement in the quality of cane. As a result, the recovery content of cane and the yield per acre did not register any significant improvement throughout, this entire period (see Table 10 and Table 11). As far as yield per acre of cane is concerned, for the period 1964-65 to 1971-72 there was an actual deterioration in the growth rate, since the compound rate of growth for the cane yield for the period 1952-53 to 1964-65 was 1.82 per cent, while it came down to 1.24 per cent for the period 1950-51 to 1971-72 (these figures can be regarded as comparable since none of the terminal years are abnormal years, either in terms of yield rates or output).

TABLE 10. RATES OF GROWTH OF YIELD, AREA, PRODUCTION AND RECOVERY PER CENT OF SUGARCANE, 1950-51 TO 1971-72
(all India)

Year	Compound Rates of Growth of Area@			Compound Rates of Growth of Sugarcane$			
	Cane	Wheat	Paddy	Area	Production	Yield	Sugar Recovery
1950-51 to 1967-68	2.52	2.12	1.25	-	-	-	-
1951-52 to 1971-72	-	-	-	2.40	3.56	1.24	(-)0.34

Note: All-India index numbers of area, production and yield, for the triennium ending 1961-62 as the base, have been used for the estimation of the respective growth rates. For working out the rate of growth of sugar recovery, the all-India recovery in each year has been derived, this being the weighted average of the actual recoveries of the major sugar producing states-the weights being the percentage distribution of sugarcane crushed in these states during the triennium ending 1961-62.
Source: @ - *Report of the APC on Price Policy for Sugarcane, 1969-70 Season.* $ - *Report of APC on Price Policy for Sugarcane, 1974-75 Season.*

TABLE 11. COMPOUND GROWTH RATES OF SUGARCANE ACREAGE AND YIELD, 1952-53 TO 1964-65

Region:	All India	U.P.	Bihar	Maharashtra	A.P.	Karnataka
Area	4.03	3.17	1.92	6.02	6.28	5.81
Yield	1.82	0.28	-1.21	0.98	2.26	3.49
Production	5.91	3.46	0.69	7.06	8.69	9.50

Source: *Report of the APC on Price Policy for Sugarcane for 1967-68 Season.*

The Sugar Enquiry Commission [1965] observed in its report that the cane price policy had contributed little towards improving cane quality and yield per hectare, though the acreage under cane had expanded considerably thanks to the expansion in the sugar mill industry and the general increase in the demand for sweeteners in India. The report drew attention to the poor record of the traditional cane growing states in the sub-tropical region vis-à-vis the new tracts in the tropical region. By the end of the Third Plan period, Maharashtra and the other southern states recorded higher yields per acre and a higher recovery per cent of cane. Given the fact that the average recovery in most states was over 9.0 per cent, and in some cases even over 10 per cent, it was right for the government to have pegged the price of sugarcane at such high levels of recovery because this gave little leeway for the mill to underweigh the cane and deprive the farmer of his due. That would over-compensate the grower for the quality of cane, thereby neutralizing the effect of the under-compensation for the quantity. However, it was not a satisfactory method in terms of its ability to improve cane quality. Hence, the Sugar Enquiry Commission recommended that the specific level of recovery (linked to the minimum price) should be lowered, and a discount provided for, so that the mills paid a lower

price for cane of inferior quality; and that for the 1965-66 season the specified level of recovery (linked to the minimum price) of cane should be brought down to 9.4 per cent from the then prevailing level of 10.4 per cent, and if possible to 9.0 per cent by 1966-67 [GOI, 1965(b), p. 92]. The recommendations of the Commission were implemented through the Sugarcane (Control) Order, 1966. While the APC [1967] recommended that the minimum price for cane should be linked to a recovery level of 8.4 per cent, the government declined to accept this recommendation until the 1972-73 sugar season on the grounds that it would have, '(a)n adverse effect ... on the price received for sugarcane by a majority of the growers in the states ... where the percentage of recovery is comparatively low' [APC, 1967, Preface, p. i].

It is apparent that cane pricing involves several different things: the minimum price for cane at a given level of recovery; the recovery rate, with respect to which the minimum price is fixed; the specified premium for higher recovery levels, linked to a minimum cane price. Each of these factors has different distributional implications for the grower and the miller. Any increase in the minimum price for cane, without a corresponding increase in the recovery level (linked to the minimum price), would clearly benefit the grower

and not the miller. This would imply a scalar increase in cane costs across all varieties or quality of cane, since only the minimum price would have been increased without any changes in the recovery rate to which the price corresponds. On the other hand, if the minimum price is not altered, but the premium for higher recovery above the 'minimum recovery level' (that is, the recovery level to which the minimum price is linked) is raised, then only those growers benefit who can supply cane with a sucrose content higher than that of the minimum recovery level.

It is not suggested that the different groups of growers supplying cane to a single mill could benefit in different ways. This is not possible, since the recovery rate of cane is an average seasonal figure arrived at for the mill as a whole. What is implied, however, is that the procedure of holding the minimum price constant, but increasing the premium for higher rates of recovery, is benefitial to growers in those regions where the sugar recovery rate is higher. Because the recovery rate is a function of water availability, climatic factors, and mill efficiency, the procedure of awarding a higher premium to higher recovery rates tends to be to the advantage of the growers in the tropical region. The implementation of this policy has not only an inter-regional income distributional effect, but an inter-class income distributional effect in the case where the better quality cane is cultivated on the larger farms. For the sucrose content is not entirely the responsibility of the grower. If cane of low sucrose content is paid for at a lower price, the grower is being penalized for reasons that are often beyond his control - the more so, since cane quality is not determined in the field, but in the factory. Similarly, the sugar mills are also differentially affected by these different forms of price changes. Changes in the SMP affect all the mills equally, but changes in the premium or recovery rates alone affect only such mills as which buy cane which falls into the relevant quality category. Thus, if a mill reports a higher sucrose recovery percentage from the cane

crushed by it then it is required to pay a higher price. This is often the cause of the private mills concealing the real recovery rates.

Problem of Rewarding Improvements in Cane Quality

The problem of locating the source of quality improvement (in terms of an improved recovery rate) is not purely the technical problem of estimating cane quality at the mill, but that of the division of the appropriated surplus between the grower and the miller. Though this has always been a bone of contention between the growers and the millers, it is not of particular relevance in the case of the cooperative sector, where the grower-miller distinction is nebulous. The problem in assessing the source of improvement in the recovery rate arises because there are no independent estimates of cane quality. Whether a higher sugar recovery is due to the better quality of the cane or better mill efficiency can be more easily determined where perceptible improvements are known to have occurred, either on the field or in the factory: such as in the introduction of new cane varieties, the extension of irrigation, faster modes of transportation of cane to the mill, the modernization of plant and machinery, the introduction of new chemical processes, and so on. If both the improvement in cane quality and mill efficiency proceed simultaneously, as was indeed the case in India during the 1960s and 1970s, then it is difficult to isolate the precise source or extent of the contribution of any given source of quality improvement.

In answering this question at the Sugar Industry Enquiry commission, (SIEC) 1974, the Indian Sugar Mills' Association took the view that: '(i) Recovery depends on the sugar content and the total sugar losses in a factory. The sugar factories play a very important role in improving the quality of cane.... After the cane reaches the factory, extraction depends entirely upon the efficiency of factories... (ii) Farmers are only interested in improving (the) yield per acre of cane and are not concerned about the quality of cane ... (iii) Ever since the system of payment of cane price on recovery basis has been instituted, the major portion of the benefit due to better quality of cane

has been passed on to the cane growers. At present it is as much as 84 per cent. Even this has not resulted in any improvement in the quality of cane as evidenced by the fact that recoveries have not shown an increase in any state ... (iv) In no other industry (is) the cost of raw materials per unit of finished product the same. It varies from factory to factory depending upon the efficiency of the factory... ' [GOI, 1974, p. 176].

This view of ISMA went against the opinion expressed by a government committee in 1970 (the Talwar Committee) which was of the opinion that the demand of the growers for the payment of a premium for a higher sugar recovery on a full proportionality basis was a, 'fair and reasonable

demand' [GOI, 1974, p. 176]. The concept of 'full proportionality' essentially implied that if the minimum price for cane was fixed with respect to a given recovery level, then any increase in cane price should be of equal proportion. Thus, if SMP is Rs 5 for 10 per cent recovery, then at 10.1 recovery the SMP should be Rs 5.05, that is, the premium on a 0.1 per cent improvement is 5 paise. On the basis of 'full proportionality', the premium on a 0.1 per cent increase in recovery in 1963-64 would have worked out to 5.21 paise per quintal. The government in fact fixed the premium at 4.0 paise per quintal. What the cane-growers demanded was this additional 1.21 paise.

TABLE 12. PREMIA FIXED BY GOVERNMENT AS PAYABLE ON A FULL PROPORTIONALITY BASIS FROM 1962-63 TO 1971-72

Season	Minimum Cane Price rupees/quintal	Basic Recovery per cent	Premuim as Fixed by Government (paise)	Preium Payable on Full Proportionality Basis (paise)
1962-3	4.34	9.8	4.00	4.44
1963-4	4.69	9.0	4.00	5.21
1964-5	5.36	10.4	4.00	5.15
1965-6	5.36	10.4	4.00	5.15
1966-7	5.68	9.4	4.00	6.04
1967-8	7.37	9.4	5.36	7.84
1968-9	7.37	9.4	5.36	7.84
1969-70	7.37	9.4	5.36	7.84
1970-1	7.37	9.4	6.60	7.84
1971-2	7.37	9.4	6.60	7.84

Source: SIEC Report, p. 174.

In opposition to the ISMA stand, the cooperative sugar mills held that: '(i) Sugar is produced in the field and not in the factory, and as such, improvement in the quality of cane is the direct result of the efforts of the growers. They should, therefore, receive in full the benefit of the improvement in quality of cane. (ii) (The) premium is primarily intended to encourage cane-growers to improve the quality of their cane.... (iii) The claim of the factories for a share in the benefit on the ground of their contribution to (the) improvement in quality of cane is unreasonable.... (iv) Even after allowing the full benefit of increased recovery to (the) cane growers, a substantial advantage remains with (sic) factories on account of (the) production of more sugar from a given quantity of cane and lower conversion charges.... (v) In the present system of averaging of cane prices in a zone for the purpose of calculation of levy sugar prices, factories with

recoveries lower than the average recovery of the zone suffer losses. These losses will be reduced by adopting the principle of proportionality in the fixation of the premium' [GOI, 1974, Pp. 175-176].

The SIEC fully endorsed the position of the growers and the NFCSF, stating that '...to allow (a) premium on (a) proportionality basis ... will mean a marginal increase in the price of cane and the consequential increase in the price of sugar. ... We (still) recommend the adoption of the principle of proportionality in fixing the sugar-cane price for individual sugar factories, as in the long run, the acceptance of this principle will prove to be beneficial to the industry as a whole, and will provide a further incentive to cane growers to improve the quality of cane' [GOI, 1974]. ISMA was not in principle opposed to any escalation of the cane price or any change in the conceptual basis as long as the mills were fully

compensated for such cane price escalations through similar sugar price escalations. In a regime of 'cost-plus' pricing, the mills would be insulated from cutbacks in their profit margins caused by cost escalations alone. In recommending the adoption of the principle of full proportionality, SIEC also recommended a lower basic recovery related to the minimum cane price. It suggested that the minimum cane price of Rs 8.00 per quintal be related to an 8.5 per cent recovery, with a premium, based on the principle of full proportionality, for every 0.1 per cent increase in recovery. The government accepted both recommendations. With effect from January 1973 the minimum price for cane was fixed at Rs 8.00 per quintal linked to an 8.5 per cent recovery rate with a premium of 9.4 paise (estimated on a full proportionality basis for every 0.1 per cent increase in recovery). This implied a sharp increase in the price of cane in the 1972-73 season as compared to the 1971-72 season.

SMP and the State Advised Price of Cane

The statutory minimum price of sugarcane is announced by the Government of India on the basis of the recommendations of the APC. This price only constitutes a floor price which the sugar mills are required to pay for cane. From the early 1970s onwards a new concept came into existence, namely, the concept of a State Advised Price (SAP). The SAP can be viewed as a 'mark-up' over the SMP, and reflects the power of the sugarcane growers' lobby in any given state, since it is the state governments which 'advise' the mills to pay a price for cane over and above the SMP. Though such state advised prices can be seen simply as arbitrarily determined, they also reflect that cane growers in the various regions view the centrally determined SMP as not adequately compensating them for their cost of cultivation, because the APC tries to take into account inter-regional comparative cost advantages in fixing cane prices.

The source of the SAP is located in the political economy of state intervention at the provincial level, as opposed to the national level. The central government has to respond not only to the demands of the cane growers and the cooperative

sector mills, but also to ISMA. The provincial governments, however, are more prone to be influenced by local pressures, and are forced to respond to the demands of the growers or cooperatives to a greater degree. SAP has considerably inflated the price of sugarcane and has introduced serious distortions in the production of sugarcane. The phenomenal increase in prices during the second half of the 1970s resulted in a steep increase in cane cultivation and the manufacture of sugar. Consequently, cane and sugar production was sustained at uneconomic levels, resulting in the over-production crisis of 1978-79. Part of the explanation for this crisis lies in the fact that this steep increase in output occurred on the basis of fairly high unit-costs of production. The domestic market could not absorb the available output without sugar prices falling to 'uneconomic' levels. In the standard literature on the theory of pricing, the concept of the 'degree of monopoly' defines the 'mark-up' over prime costs. In the case of the SAP, one could use the concept of the 'degree of manipulative power' which determines the mark-up over the SMP. The greater the power of a cane grower's lobby, the higher would the SAP be pegged.

Determination of the Free-Market Price of Cane

Of the total output of cane, only a third goes into the manufacture of sugar while nearly half of the output is utilised for the production of *gur* for India as a whole. There are however widely divergent patterns in the different cane producing regions. In parts of the tropical region, for example, in Maharashtra in particular, the part of cane output utilised for the manufacture of sugar is as high as 80 per cent of the total locally available cane. In parts of U.P. And Bihar, on the other hand, less than 20 per cent of the cane cultivated in certain districts is used by the sugar mills; most of it is used for the manufacture of *gur* and *khandsari*.

The second point is that cane cultivation is essentially aimed at its eventual conversion into one of the three important sweetening agents: sugar, *gur* or *khandsari*. What is left for other purposes, such as seed, feed and chewing, is essentially a residual. Thus, the cultivation of

cane is a function of the demand for sweeteners, and the final price of cane is an outcome of the relationship that prevails in any given region between cane cultivators and the various processors of cane (taking account of the bargaining power of the grower as a function of the kind of market he is operating in). The price paid by the mills is a fixed price. The non-mill price for cane, on the other hand, is a flexible price. In general, the price of cane in the unregulated market is a function of the total output of cane and the relative mill demand for cane. Assuming that the Farm Harvest Price (FHP) of cane is a proxy for the flex price (that is, the price paid by non-mill users of cane) it can be shown that sale to the mills is in general preferred by the growers, since the SMP and the actual prices paid compare favourably with the FHP of cane (Table 13).

TABLE 13. FARM HARVEST PRICE AND STATUTORY
MINIMUM PRICE OF CANE

(Rs per quintal)

Season	SMP	FHP (Uttar Pradesh)	Difference (SMP - FHP)
(1)	(2)	(3)	(4)
1957-58	3.85	3.62	+0.23
1958-59	3.85	3.64	+0.21
1959-60	3.85	3.62	+0.23
1960-61 ·	4.34	4.05	+0.29
1961-62	4.34	3.80	+0.54
1962-63	4.34	3.86	+0.49
1963-64	4.69	5.09	-0.40
1969-70	7.37-9.35	4.84-7.86	+2.53-1.49
1970-71	7.37-9.22	5.37-8.02	+2.00-1.20
1971-72	7.37-9.48	7.17-9.60	+0.20-0.12

Note: The difference between SMP and FHP partly reflects the transport costs of the cane to the sugar mill, since the SMP is paid at the mill gate and the FHP paid at farm. However, transport costs alone cannot explain the observed gap, at least in some seasons. Further, the actual price paid is higher than the SMP (see Table 9).
Source: i. APC Reports (various years); ii. Bulletin of Sugarcane Statistics in India (Districtwise), Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of India, 1976.

As long as the market is unregulated and gur prices can in fact rise without any check on them, the diversion of cane away from the mills to the non-mill processors in a trough output season continues to destabilize the sugar mill industry.

Further, in most parts of India gur manufacture is a cottage industry, and is within the technological reach of the cane grower. The grower can convert his cane into gur with ease. This places the mill in a precarious position. On the other hand, this ability of the cane grower to convert his cane into gur is perhaps the only guarantee he has against the risk of his cane being rejected by a mill, or of delayed harvesting reducing its quality in terms of sucrose content.

The problem of diversion is compounded by the peculiarities of the demand structure for sugar and gur. The price elasticity of sugar demand is -0.64 while that for gur is estimated to be -0.216. Hence, a one per cent increase in the cane price during a trough output year has different consequences for sugar and gur demand. Since gur prices are not regulated, the tendency for a higher escalation of gur prices is obvious. This relative inelasticity of gur demand, along with absence of controls on gur prices, allows gur producers to cushion a cane price hike and to divert cane away from the mills. While these are the first round effects of an excess demand for cane, in the second round the initial increase in sugar prices results in an increase in gur demand. This increased demand is produced by the cross price elasticity of gur demand with respect to the sugar price, which is 3.01 (that is, a 1 per cent increase in sugar prices results in a 3 per cent increase in gur demand). This causes a second round increase in gur prices, given the relative inelasticity of gur demand [GOI, 1979; BICP, 1983]. In other words, any shortage of cane in a trough output year can result in a diversion of cane to the non-mill users of cane. As a result, the sugar mills may be forced to pay even higher prices for cane, over and above the SMP (the SMP itself may be pegged at high levels in a trough year to allow the sugar mills to compete for cane). A further consequence is that any escalation in the cane price, as a result of both the rising gur and sugar prices, induces growers to expand the area under cane. It is this very process of expan-

sion that soon results in an over-production crisis, depressing the cane price, and turning the cane cycle downwards.

Structure of Cane Cultivation

It is clear that the 1960s and 1970s were a period in which the cane grower witnessed an improvement in his bargaining power vis-a-vis the sugar mills due to two factors: first, to the increased clout of the landlord and peasant classes with the government; secondly, to the emergence of the sugar cooperatives, which have in general exercised an upward pressure on cane prices.

The sugar cooperative factor is the more important of the two, but has had an uneven impact across the cane cultivating regions. This is clearly established in Table 14 which shows that for a given level of recovery, the U.P. mills pay a lower price for cane as compared to the Maharashtra mills. The former are mainly private sector mills, the latter mostly cooperative sector mills. It can, therefore, be inferred that these price differentials reflect the difference in the economic power of the respective cane growing peasants in the different regions. The data presented in Table 14 is highly aggregative, covering all the mills in the two states. Even the inference drawn regarding the differential impact of the prevalence of cooperatives must be interpreted with caution, since in both states one encounters a mixture of private and cooperative sector mills. However, the argument is valid to the extent that in Maharashtra the cooperative sector is dominant, while in Uttar Pradesh the private sector is the dominant one. In Maharashtra cane is largely cultivated in medium and large holdings, while in Uttar Pradesh cane is largely cultivated on small and semi-medium sized holdings. The structural differences in the pattern of cane cultivation across the different classes of agricultural households is obvious from Table 15. On the basis of this data, and on the basis of the information available on the actual prices paid for cane and the ownership structure of the sugar mill industry, it can safely be asserted that the observed price

differentials in cane are largely due to the predominance of the cooperative sector in one region, and to the fact that cane is cultivated here by big landowning households.

TABLE 14. ACTUAL CANE PRICE PAID AND SMP OF CANE
(WITH 9.8 PER CENT RECOVERY)

(Rs per quintal)

Season	SMP	Actual Cane Price Paid		
		Uttar Pra-desh	Maharasht ra	All India
(1)	(2)	(3)	(4)	(5)
1967-68	7.58	12.45	17.17	13.20
1968-69	7.58	9.61	11.85	10.24
1969-70	7.58	7.69	9.53	8.11
1970-71	7.64	7.90	10.70	8.46
1973-74	9.24	13.96	15.29	13.40

Note: The SMP of cane relates to cane with 9.8 per cent recovery. The Actual Prices have been estimated from the A.S.I. data and appropriately adjusted for the above recovery rate. In standardizing the data for comparability, the official discount and premia rates for differences in cane quality have been used.
Source: i. APC Reports (various issues); ii. Annual Survey of Industries, (A.S.I.), Vol. II.

TABLE 15. SUGARCANE CULTIVATION BY SIZE-CLASS OF
OWNERSHIP HOLDINGS, 1970-71

(percentage share)

Type of Holding (1)	Size-Class (hectares) (2)	All India (3)	Uttar Pradesh (4)	Mahara-shtra (5)
Marginal	0.0-0.5	-	6.8	2.1
Marginal	0.0-1.0	13.7	17.2	6.3
Small	1.0-2.0	16.4	19.3	10.5
Semi-Medium	2.0-4.0	24.6	27.2	19.5
Medium	4.0-10.0	29.6	26.9	35.3
Large	10.0 & above	15.7	9.6	27.3
Total		100.0	100.0	100.0

Note: Given this pattern of land distribution, it is not surprising that for a 1,250 tcd. mill in Maharashtra only 3,000 to 4,000 growers supply cane, while in Uttar Pradesh nearly 30,000 growers sell cane to a single mill.
Source: All India Report on Agricultural Census, 1970-71, Ministry of Agriculture and Irrigation, Government of India, 1975.

Such an inference is further strengthened by the fact that the observed price differentials are not due to variations in the cost of cultivation. The data is standardized for a uniform recovery percentage, which neutralizes, to a large extent, any differences in the unit cost of cultivation that may

exist across the regions. Therefore, the unit cost variations at a given recovery level (in this case 9.8 per cent) should not be very significant. Even if they are, it would be expected that unit costs would be lower in Maharashtra than in Uttar Pradesh, since the cost of cultivation of cane per quintal is lower in Maharashtra (where sucrose content is higher) as compared to U.P.

The data available for 1973-74, (cost of cultivation per quintal in Deoria and Muzaffarnagar in U.P. of Rs 6.79 and Rs 5.77, respectively, and in Ahmednagar, Maharashtra of Rs 4.56) together with the fact that over time unit costs could only have increased, would suggest that such cost differentials cannot explain the price differentials. Hence, it appears fairly clear that the higher price derived from the sale of cane to the sugar mills in Maharashtra is mainly due to institutional rather than purely economic factors (cost, quality and so on). These institutional factors include the existence of a cooperative sector dominated by landlord and rich peasant households, which in turn constitute the majority of the cane-cultivating households.

Such inter-regional, inter-class and inter-sectoral variations in cane prices also affect structural change. For example, the increasing share of the cooperative mill sector within the sugar industry has played an important role in influencing the process of cane price formation over the last three decades (not just in the case of Maharashtra but in other states as well). One can postulate a 'wage drift' kind of argument, where the escalation in cane prices in one region, ceteris paribus, must have influenced cane price formation in the other regions as well. This cane price escalation and the consequent output and acreage expansion is both a cyclical phenomenon and partly a specific phase in the evolution of the sugar mill industry in India, which has also been influenced by the 'exogenous' factors of agrarian change: the 'green revolution' in both cane and competing crops, the spread of subsidized irrigation, the changes in the demand pattern for sweeteners with increasing urbanization, and so on.

The specific trends in cane price formation - the emergence of the State Advised Prices in the 1970s, the decision to link cane price to its quality

in the early 1970s and so on - must also be viewed in the context of the overall trends in agricultural price movements in this period. The movement of the terms of trade in favour of agriculture during the late 1960s and 1970s has clearly had its effect on sugarcane, an important commercial crop [Mitra, 1977, Chapter 8]. An exercise conducted on the movement of the terms of trade with respect to sugarcane and other commodities, shows that the net barter terms of trade and the income terms of trade have improved in favour of sugarcane cultivation at a compound rate of 0.2 to 0.5 per cent and 3.3 to 3.5 per cent per annum, respectively, for the period 1961-62 to 1977-78 [Thamarajakshi, 1978]. However, this being a 'cyclical' trend, the compound rate of growth would work out to much less if estimated, for say, the period 1963-64 to 1974-75, sensitive as it is to the choice of end points. Further, any aggregative analysis of this nature is misleading to the extent that it does not take cognizance of the important inter-regional and inter-class variations in the distribution of gains. In addition, cane arrears - whereby, through delayed payment for cane the miller accumulates the interest rightly due to the grower - are a further burden. The accumulation of cane arrears, even when the cane price paid on paper may be high, deprives the grower of his actual share, influencing his investment decisions, for the next season. As a result, one can still confront cyclical fluctuations in output even in a situation where the long-term trend suggests an improvement in the prices realised.

VIII. THE STRUCTURE OF DEMAND AND THE PRICE POLICY FOR SUGAR

In India, mill-made white crystal sugar entered the consumption basket of Indian households only in the early part of the twentieth century. However, its current importance within the urban and semi-urban consumption basket cannot be underestimated. The sensitivity of the consumer to the price of sugar is indeed enormous, so much so that no government can afford to neglect a steep increase in sugar prices. It is, therefore, not surprising that sugar is one of the commodities sold through the largely urban-oriented 'public distribution system'. Even as government policy has been to assure the cane grower a 'fair price'

and the sugar mills of a 'reasonable rate of return', it is also constrained to ensure that the consumer secures sugar at an acceptable price.

Demand Structure

Sugar is the second most important sweetening agent in Indian households, next to *gur*, the traditional sweetener used both in cooking and in the preparation of beverages, sweets and so on. Sugar is fast replacing *gur* in the urban upper income consumption basket. The annual per capita consumption of sugar in urban areas was estimated to be 15.15 kg in 1971, as opposed to a rural per capita consumption of 5.35 kg per annum [GOI, 1976, Part III, Appendix III.3, p. 51]. Given the distribution of the population between urban and rural areas during 1971-81, it can be estimated that the urban consumption of sugar accounts for nearly 40 per cent of total sugar sales. This may indeed be an underestimate, since the share of 'levy sugar' in total sugar sales, the sale of which is largely confined to the urban areas, is 60 to 65 per cent. Secondly, the urban consumption figure may be an underestimate because it does not take into account the sugar consumed indirectly in the form of confectionery, chocolates and so on. Finally, the National Sample Survey (NSS) estimate of consumption, particularly with regard to commodities like sugar, the consumption of which increases rapidly with increases in income, is known to in general understate consumption and, in particular, to understate the consumption of the upper income groups [Dandekar and Rath, 1970; Gupta and Ramaratnam, 1975]. Despite the fact that the NSS underestimates the consumption of the rich, it can still be seen that the consumption of sugar is highly skewed (see Table 16).

The underestimation of skewness on account of the shortcomings of the NSS methodology may be neutralized by the fact that the skewness itself may have been reduced on account of the introduction of price controls and the sale of sugar through the ration shops in the post-1961 period. In sum, Table 16 probably gives a fairly reliable account of the extent of the inter-class skewness in consumption of sugar, at least for urban India, even if it is still an underestimate for rural India

(where there is generally no effective public distribution system, except in a few states like Kerala).

TABLE 16. CONSUMPTION OF SUGAR ACCORDING TO POPULATION DECILES, ALL INDIA, 1961-62

Income decile	Rural		Urban	
	Relative share	Cumulative share	Relative share	Cumulative share
(1)	(2)	(3)	(4)	(5)
1	1.32	1.32	3.62	3.62
2	2.21	3.53	6.23	9.85
3	5.26	7.47	6.09	15.94
4	6.62	11.88	8.28	24.22
5	10.63	17.25	8.34	32.56
6	6.88	24.13	9.72	42.28
7	9.41	33.54	10.57	52.85
8	12.50	46.04	14.78	67.63
9	18.37	64.41	21.44	89.07
10	35.59	100.00	10.93	100.00

Source: Computed from the *NSS Report on Consumer Expenditure*, Report No. 200, 1961-62 (17th round).

Despite important urban-rural and inter-class inequalities in the consumption of sugar, the average per capita consumption of sugar for India as a whole has increased rapidly. Yet, it still compares very poorly to the per capita consumption levels in most developed and developing countries. The per capita consumption of sugar increased from an average of 3.5 kg in 1950-53, to 5.1 kg in 1960-63, and to 8.1 kg in 1980-83 (Table 17). And yet, consumption remains below the average for the Asian continent and is barely a third of the level of the other major Asian sugar producing country, the Philippines. This data suggests that there is significant scope for expanding domestic consumption of sugar in India. This is partly supported by the estimates of the expenditure elasticity of demand for sugar, especially for rural areas. The urban expenditure elasticity of demand is estimated to be 1.11 while for rural areas the figure is 1.65 [GOI, 1976, Part III]. Given that the price elasticity of demand for sugar is estimated to be -0.64, it would appear that the sugar demand would increase with the increase in income even when there is moderate inflation. The sugar mills can easily cushion the negative impact of a price escalation if the income growth is of an order that would more than compensate for the price rise. On the other had, in a season of excess supply in the sugar market,

a reduction in sugar prices when real incomes remain constant or increase only marginally, would not help to clear that market, unless it is substantial enough to induce extra demand.

The implications of these trends are important for the management of the sugar cycle. What this relationship suggests is that in a season of excess demand price increases may not help to restore equilibrium, just as price cuts may not help in a season of excess supply. In both cases, if household income is held constant, the manipulation of prices alone would not help to ensure equilibrium between supply and demand. This emphasises the importance of physical intervention, of non-price intervention in the form of buffer stocking, of rationing, and of increasing export or imports (depending on the nature of the market disequilibrium) in reducing the impact of output fluctuations. The weak relationship of consumer demand to price suggests that in a season of excess demand there is an excessive pressure on prices causing them to rise, while in a period of excess supply, any pressure as may exist is resisted by the millers and traders, thereby causing a glut in the market. That is, in a season of excess demand the lack of well-articulated consumer resistance in the semi-urban and rural areas, may allow sugar prices to rise sufficiently to restore market equilibrium. On the other hand, in seasons of excess supply, the resistance of the millers and traders to a fall in prices forces an over-production crisis. The only solution to this is to build buffer stocks in sugar or to export, as appropriate. It is easy to envisage in such a context the crucial role of state intervention in restoring stability to an inherently unstable sugar market.

Logic of Price Controls

In a season of excess demand, state intervention is necessitated by the demands of the consumer in order to prevent sugar prices from rising sharply. Controls on the price and sales of sugar became an obvious form of state intervention. In a season of excess supply, it is the millers and the growers who demand state intervention to prevent sugar prices from falling to uneconomic levels. State intervention would then require the 'pegging' of sugar prices at some notional 'floor' and

the financing or managing of the accumulated stock. Through the course of a cycle, therefore, both groups recognize the utility of state intervention. So despite their mutually contradictory goals or objectives, both producers and consumers acquire a stake in the price and distribution controls.

However, not all categories of producers are in favour of price and distribution controls. Indeed, the lower cost millers - the more 'efficient' producers - may be willing to accept free-market conditions when this helps them to increase their share of the home market. The pressure in favour of controls, therefore, comes mainly from the higher cost producers who view state controls on sales as a way of forming a cartel to freeze the market shares. Consequently, the existence of controls is not simply a result of market instability, but is a result of the prevailing structural disjunction in the mill industry wherein a few high cost mills see their position within the market threatened by the emergent low cost mills. If state intervention only helps to deter rather than hasten a process of structural and technical change within the industry, then it can be argued that state intervention merely perpetuates itself rather than creates the conditions for its elimination. The longer structural change is delayed the more unstable the market becomes.

Other factors have also been responsible for the imposition of controls at particular points in time. The imposition of price controls during 1950-51 was a direct sequel to the role played by the Indian Sugar Syndicate in 1949-50 in pushing up the price of sugar. After the withdrawal of recognition from the ISS and after stability was restored to the sugar market, prices were without controls up to 1957-58. This interim period, 1951-52 to 1957-58, was a period of price stability (see Table 17, last column).

The second round of price controls was associated with the foreign exchange crisis of 1957-58, when sugar exports became an important source of foreign exchange [GOI, 1975]. During the period 1958-59 to 1960-61 sugar price control appears to have been motivated primarily by the concern to restrict the domestic consumption of sugar without inflating prices, and to generate exportable surpluses.

As a result, while the domestic output of sugar for the period 1958-59 to 1961-62 was nearly 102 lakh tonnes, domestic consumption was restricted to only about 89 lakh tonnes. From the accumulated stock of nearly 13 lakh tonnes, as much as 11.52 lakh tonnes were exported during 1960-63

(see Table 17). The imposition of price and distribution controls were quite clearly motivated by the foreign exchange requirements and by the government's unwillingness to allow domestic prices to rise unduly.

TABLE 17. SUGAR 1950-51 TO 1982-87

(figures cols (4) to (8) in lakh tonnes)

Sugar Season	Pricing & Sales Regime	Ratio of Free Sale to Levy Sugar	Output	Stocks on 1 October	Total Available	Consumption (Home)	Export (+) Import (-)	Per Capita Consumption (kg.)	Index of Sugar Prices $
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1950-51	-		11.34	0.91	12.82	10.98	-0.57	3.0	50.5
1951-52	Decontrol		15.20	1.84	17.04	11.82	+0.08	3.2	52.5
1952-53	Decontrol		13.17	5.14	18.91	16.79	-0.60	4.4	50.7
1953-54	Decontrol		10.30	2.06	19.65	18.36	-7.29	4.8	50.2
1954-55	Decontrol		16.20	1.29	23.25	17.51	-5.74	4.5	52.9
1955-56	Decontrol		15.90	5.74	25.35	19.72	-0.64	5.0	47.8
1956-57	Decontrol		20.78	5.61	26.35	20.18	+1.47	4.9	48.0
1957-58	Decontrol		20.06	4.70	24.79	20.75	+0.36	5.0	55.8
1958-59	Control		19.51	3.68	23.19	21.13	+0.30	5.0	61.2
1959-60	Control		24.84	1.76	26.58	20.53	-	4.7	62.6
1960-61	Control		30.29	6.05	36.34	21.27	+2.47	4.8	64.4
1961-62	Decontrol		27.14	12.60	39.74	25.87	+3.61	5.8	63.6
1962-63	Decontrol		21.52	10.26	31.78	24.88	+5.14	5.4	89.3
1963-64	Control		25.73	1.76	27.45	23.36	+2.50	4.9	70.6
1964-65	Control		32.00	1.59	33.59	24.50	+3.00	5.1	76.4
1965-66	Control		35.41	8.59	44.00	28.10	+3.74	5.7	77.6
1966-67	Control		21.51	12.16	34.73	26.01	-2.35	5.1	82.8
1967-68	Partial control	60:40	22.48	5.37	27.85	22.11	+1.39	4.3	93.3
1968-69	Partial control	70:30	35.59	4.35	39.89	26.04	+0.79	5.0	100.8
1969-70	Partial control	70:30	42.62	13.06	55.68	32.61	+2.17	6.1	99.9
1970-71	Partial control	60:40	37.40	20.90	58.30	40.25	+3.95	7.3	100.0
1971-72A	Decontrol	60:40	31.13	14.10	45.23	37.80	+1.44	6.7	121.7
1972-73	Partial control	70:30	38.73	5.99	44.72	35.11	+0.97	6.1	152.7
1973-74	Partial control	70:30	39.48	8.64	48.09	35.18	+4.05	6.1	151.1
1974-75	Partial control	65:35	47.97	8.78	56.83	34.76	+9.24	5.9	169.7
1975-76	Partial control	65:35	42.62	12.84	55.45	36.89	+10.21	6.2	168.9
1976-77	Partial control	65:35	48.40	8.35	56.75	37.57	+3.12	6.2	173.1
1977-78	Partial control	65:35	64.61	16.06	80.67	44.82	+2.02	7.3	159.4
1978-79**	Decontrol	65:35	58.41	33.83	92.24	62.14	+8.63	9.7	-
1979-80@	Partial control	65:35	38.58	21.47	62.05	52.08	+2.90	8.0	-
1980-81@	Partial control	65:35	51.48	6.87	60.35	49.80	+0.61	7.2	-
1981-82	Partial control	65:35	84.37	10.09	94.46	57.11	+3.83	8.1	-
1982-83	Partial control	65:35	82.30	33.52	115.82	64.61	+4.22	9.0	-
1983-84	Partial control	65:35	59.17	46.80	106.61	75.70	+7.06/-0.64	10.5	-
1984-85	Partial control	65:35	61.44	23.85	98.18	80.20*	+0.38/-12.89	10.9	-
1985-86*	Partial control	65:35	70.16	17.60	108.76	83.13*	+0.33/-21.00	11.1	-
1986-87*	Partial control	65:35*	85.02	25.30	119.85	87.45*	+0.20/-9.53	-	-

Note: A Prices decontrolled from May 1971 to May 1972.
** Prices decontrolled from August 1978 to June 1979.
@ Sugar imports of about 2 lakh tonnes per year in 1979-80 and 1980-81.
$ Last column gives Index of Sugar Prices (deflated by Index of All Commodities) with Base: 1970-71 = 100.
* Provisional = including imported sugar.
Total availability₁ = Domestic Output₁ + Stock₁, Imports₁ - Exports₁.
Source: i. *Indian Sugar* (various issues), ii. *Report of the Sugar Enquiry Commission*, 1965, iii. H.L. Chandok, *Wholesale Price Statistics, 1947-78*, ESRF, October 1978.

While price controls motivated by the above considerations may be called 'demand-oriented' price controls, or price controls aimed at demand management, there are also 'surplus-oriented' price controls. When some mills are unable to face the competitive pressure of other mills, they may welcome price and distribution controls as a means of protecting market shares and profit margins. In a season of excess supply, when sugar prices are falling in the free-market, but the mills are still constrained to pay a minimum cane price, they invite controls in the final product price as a way of protecting their profit margins and retaining the ability to pay the required cane price.

The price controls which are motivated by the structural requirements of the mill industry are, however, qualitatively different from the controls introduced for the restoration of market equilibrium, or for meeting short-run requirements of either the domestic or external markets. The latter controls, tantamount to an intervention in the normal workings of the free market, are aimed at correcting a distortion, or a disequilibrium, or at meeting a temporary objective (like the generation of an exportable surplus). The former controls, however, are fundamental to the preservation of the existing structure of the industry, and are in operation for long-term objectives - like the protection of high cost mills, providing support to cane cultivation in a specific region, and so on. Such price controls can be eliminated only if fundamental structural changes have been carried out.

Given the fact of a highly differentiated industrial structure it is obvious that the choice between different policy options is not merely a choice between a 'controlled' market and a 'de-controlled' market, but that between the various locational, sectoral, and other structural characteristics. The complexity of the situation is often not understood. The Sugar Enquiry Commission [1965] considered alternative price regimes, rejecting the then existing system of full control, (with its region-specific cost-plus pricing, which assured a uniform rate of return to all mills irrespective of their unit costs of production) which militated against the long-term efficiency of the industry and protected high cost units [GOI, 1965(b),p. 87,para 3.2]. Further, the Commission

categorically stated that, 'While realizing the need for providing some protection to high cost regions in the immediate future, the system of sugar price fixation should not be allowed to degenerate into a "cost-plus" basis' [GOI, 1965(b), p. 87, para 3.12].

The Commission's views thus went against the thrust of the Tariff Commission's recommendations, which had legitimized the system of cost-plus pricing administered for sugar. It not only advocated 'a fair price payable for sugar' but also calculated this for the different regions on the basis of the regional cost schedules [Tariff Commission, 1959]. Implementing the recommendation in 1960, the government announced that the price of sugar would henceforth not only cover the cost of production, derived from the separate cost schedules prepared for different regions, but would also allow for a 12 per cent rate of return on the capital employed so as to, '(p)rovide sufficient funds for each unit to meet its commitments under bonus and gratuity (schemes), interest on borrowed capital and debentures, dividends on preference shares, managing agent's commission, income-tax, and finally leave a residue to a large majority of the units in all regions to declare reasonable dividends' [GOI, 1974, Resolution No. 49-1/59-62, dated April 1960, Ministry of Food and Agriculture, Government of India, cited in ISMA Memorandum to SIEC, 1974]. The adoption of cost-plus pricing under the regime of control was, therefore, accompanied by a move to a less aggregated costing system. While the Tariff Commission prepared regional cost schedules for four regions, the government worked out separate cost schedules for another 16 sugarcane cultivating regions which were virtually coterminous with the administrative regions of the states, and fixed separate ex-factory prices for each region. The government's decision to increase the number of regions for which separate cost schedules were prepared, implied that within each region more mills would be protected from competition from the lower cost mills. The lower cost units naturally objected to this procedure, not only because they did not secure any 'advantage' from being a lower cost unit, but also because the final price of sugar - pushed up by the high cost units

- would tend to restrict the size of the home market for sugar and impose a demand constraint on the growth of the industry as a whole [Gadgil, 1965]. For their part the cooperative sector also preferred no control of prices and sales, and continuation of regulated monthly releases. Given these differing positions any policy of sugar pricing had to reconcile the conflicting interests of equally influential segments of the industry, to take into account the welfare of the consumer, especially the urban consumer, which meant that any price regime would also have to ensure price stability as well. Neither full control nor the lack of it could meet such diverse requirements.

The solution the Sugar Enquiry Commission (SEC) put forward appears limited under the circumstances. The SEC offered two alternatives: (a) full decontrol of sugar with a buffer stock in sugar, wherein this buffer stock would be used to stabilize sugar prices; (b) full control of sugar prices, with provision to allow the sugar mills to compete effectively with the uncontrolled *gur* and *khandsari* producers for cane. The SEC argued that in the case of the first alternative, 'A buffer stock policy for sugar will not only stabilize, within reasonable limits, the prices and consumption of sugar but also, by preventing the sugar prices from falling below a specified level, enable the factories to pay the minimum price of cane without hardship. Further, by leaving the cane price free above the minimum specified level, it will enable the factories to compete with *gur* and *khandsari* for cane supplies, thereby minimizing the fluctuations in sugar output. In addition, since *gur*, *khandsari* and sugar will be left free to compete amongst themselves for the overall demand for sweetening materials, their price parity will tend to be preserved, so that the same buffer stock which stabilizes sugar prices will also help exert a stabilizing influence on *gur* and *khandsari* prices. This would be particularly so if the buffer stock policy is operated with an eye not only on sugar but also on *gur* prices, releasing more sugar out of the stocks, when the upward pressure on *gur* prices is specially acute and acquiring more sugar when *gur* prices are declining sharply' [GOI, 1965(b)].

In the case of the alternative of complete control, the SEC formula would have required a fairly

high price for sugar and/or a high excise duty component, which would be used as a flexible margin between unit costs and prices. This would enable the mills to be able to compete with the unregulated processors of cane, so that in a year of cane surplus when the mills have no cane availability problem, the entire proceeds of the excise duty would go to the government, while in a season of cane scarcity the government would give an excise rebate to the mills. With this money the mills could pay a higher price for cane and successfully compete with *gur* manufacturers.

The first solution of full decontrol required the maintenance of a substantial buffer stock by the government, while the second alternative required both considerable excise duty rebates in seasons of cane shortage and the maintenance of sugar prices at fairly high levels. Both solutions implied a burden on state expenditure, which in the circumstances may have dissuaded the government from accepting the SEC recommendations. It was in this context that in 1967 a regime of partial decontrol was evolved by the then Union Minister for Food and Agriculture, Jagjivan Ram.

Regime of Partial Decontrol

There were essentially two different sets of considerations that motivated price and distribution controls in the case of sugar. First, the need to make sugar available at a 'reasonable' price to the consumer and, secondly, the need to protect the economic interests of certain mills, and of the growers dependent upon them. These two goals are clearly contradictory and could be reconciled only for short periods of time, under specific conditions. During the regime of control, 1963-64 to 1966-67, it became increasingly difficult for the government to maintain these conflicting objectives. The crisis of 1966-67 and 1967-68 focused the urgent need of reform in sugar policy. It was in this environment that the regime of partial decontrol (which proved to be the longest continuously operated system of price and distribution control in sugar) came into existence.

Under the regime of partial decontrol, the domestic sale of sugar is divided into two distinct categories: levy and free-sale. (The ratio of levy to free-sale has varied over time, with the levy

quota ranging from 50 to 70 per cent of the total output.) The levy price of sugar is determined on the basis of the ex-factory value of sugar as assessed by the government for the various sugar producing regions. While the levy price of sugar was a cost-plus price, it did not necessarily protect all the mills in a given region. If in the case of some mills the levy price was below the mill's unit costs of production, it was expected that the mill would make up for this loss through the sale of free-sale sugar at a higher price on the open market. However, the price of free-sale sugar is also not completely free since the government stipulates a free-sale quota for each mill, just as it stipulates a levy quota. This is a two-tier system of pricing rather than a 'dual' pricing system, since the free-sale price differs from the levy price to the extent that the free-sale price is allowed to prevail at higher levels.

The purpose of such a two-tier pricing system is quite clearly to facilitate differential rates of return, so that, on an average, the sugar mills can still secure a notional 'fair rate of return' (as defined, for example, by the Tariff Commission). Implicit to this interpretation of partial decontrol, is an assumption that a 'fair price' for sugar and a 'fair rate of return' are irreconcilable in a single sugar price. The policy was, therefore adopted [Jagjivan Ram, 1968].

The Agricultural Prices Commission recognized the merits of partial decontrol, stating: 'The consumer has been provided his basic requirement of sugar at a fair price and yet, through the provision of a free market in the commodity, the sugar industry has been allowed the flexibility, not available in a regime of complete control, of paying for cane a price higher than the minimum statutory price so as to enable it to compete with gur and khandsari' [APC, 1972, p. 1].

It appears that the decontrol of sugar prices in 1971-72 and 1978-79, are exceptions which prove the rule. During these two intervals the decontrol of sugar prices had disastrous consequences. The period 1971-72 was a trough year of the 1969-70 to 1974-75 cycle (see Table 17). In consequence, the decontrol of sugar pushed up prices by over 20 per cent; the Index of Sugar Prices (deflated by the All Commodities Price Index) rose sharply

from 100.0 to 121.7 after having remained in the range of 93.3 to 100.8 during the preceding four years. In the 1978-79 episode, sugar prices were decontrolled during a peak output year and accompanied by a withdrawal of the regulated release mechanism. As a consequence, sugar prices slumped from an all-time peak of 173.1 in 1976-77 to below 150.0 in 1978-79.

The 1978-79 over-production crisis only underscores the critical role of the system of controls operating in the pricing and distribution of sugar. The withdrawal of controls would precipitate a crisis in the sugar market only in seasons of excess supply (a peak output year) and of excess demand (a trough output year), and not in normal years, but such peaks and troughs arrive with systematic regularity in sugar and sugarcane production. Unless such cyclical fluctuations are themselves eliminated, the withdrawal of controls could still prove disastrous - to the consumer, the grower, or the miller, depending upon the combination of circumstances within which decontrol occurs.

IX. PRICE CONTROLS, OUTPUT FLUCTUATIONS AND THE POLITICAL ECONOMY OF STATE INTERVENTION

An important aspect of the sugar and sugarcane economy in India, is the problem of output fluctuation: a chronic instability in the acreage under cane, and in the output of sugar and sugarcane. While such fluctuations do not follow a systematic pattern, they do produce a four - to five-year cycle with varying amplitudes of fluctuation. Such instability in output has not been eliminated either by controls on pricing and sales of sugar, or by the widespread structural changes that have occurred in both the sugarcane and the sugar economies.

Interaction Between Price and Output

In any market in which a producer's current supply is a response to the price prevailing in the previous period of production, market equilibrium can only be established through a series of adjustments over several successive periods. Such a process of arriving at an equilibrium through an iterative process of price and output adjustments forms the basis of the 'cob-web' cycle. The speed of adjustment is determined by

the supply and demand curves , that is, by their respective elasticities. A 'price and output' cobweb may be stable or unstable, either tending to or moving away from an equilibrium point. The less steep (that is the more elastic) the demand curve, and the more steep (the less elastic) the supply curve, the more rapidly will the cobweb pattern of adjustment, set in motion by a temporary disturbance, converge towards equilibrium. The notion of a cobweb type of adjustment has commonly been used to explain such price-output interaction and the phenomenon of cyclical fluctuations in the case of a long gestation crop like cane. However, any empirical analysis of a cobweb type price-output adjustment mechanism must distinguish between a purely theoretical and an historical sequence of events. An output cycle is the product of both price and non-price factors. What the cobweb explanation captures is only the role of the price factors, while non-price factors are not taken into account.

The first major study of cane output and acreage cycles in India for the period 1900 to 1939 establishes the existence of a cobweb cycle. 'The price-area relationship uncovered embodies a two-way causation. Price cycles are, in the main, supply cycles and area cycles are, in the main, price inspired" [Dharm Narain, 1965]. The cobweb explanation is valid only within a purely competitive model where prices are flexible and not fixed. The period chosen for analysis was by and large characterized by a free market in cane. The policy of stipulating a minimum price for cane began only in 1934, and then it was confined to only those parts of U.P. And Bihar where the sugar mills had already been well-established.

Any analysis of output fluctuations in cane can no longer operate within a simple cobweb model, since it has to account for two important developments which have altered the character of the cane market in post-Independence India. These factors are, first, the stipulation of a 'cost-plus' statutory minimum price for cane announced at the time when the grower makes the investment decision, and, secondly, the emergence of the sugar cooperatives, in which the growers not only

find a secure market for their produce, but where the 'minimum' price is only a floor price for cane and the actual realisations are normally higher.

Alternative Models of Price-Output Interaction

Model One: In the simple cobweb type model of adjustment, commodity prices are flexible and the producer is unaware of forward prices and all 'forward' production decisions are taken on the basis of the existing or 'spot' prices. In the case of sugarcane, such a process would automatically transmit any instability in cane output to the output of all processed cane products (namely, *gur*, *khandsari* and sugar), because cane is a highly perishable crop and the cane crop has to be converted almost immediately after harvesting into one or another form of its processed products. However, the demand elasticities of the various processed products are incompatible with the sensitivity of the consumer to price fluctuations. To this extent, the magnitude of the fluctuations induced by cane instability would naturally be different in the case of each product. In such a case, even if the organized mill sector was able to maintain a nominal buffer stock of sugar, it would still not produce stability in cane prices and output, unless the share of the cane output sold to the sugar mills was sufficiently large, or the buffer stock was big enough to 'discipline' the entire market for sweeteners. Unfortunately, in the case of cane in India, it is *gur* which occupies the largest part of the demand for cane. Given the dispersed and unorganized structure of *gur* production, it is far more difficult to maintain a buffer in *gur* than in sugar. Also, *gur* buffer stock will deteriorate in storage.

Model Two: This model explains the cane and sugar cycle by the operation of price controls on sugar and cane but ignores factors explained by a cobweb type model, such as the uncertainty regarding 'forward' prices. Any policy aimed at assuring a minimum price for the commodity has to eliminate output instability. However, it is argued in this model: 'The basic cause of periodic fluctuations in the area under sugarcane, and in sugar output, resides in the fact that the fixation

of the minimum sugarcane price prevents sugarcane farmers from adapting the supply of sugarcane to the demand for sugar while, because of sugar price control or artificial stimuli to 'maximize' sugar output, sugar production either seriously falls short of demand or overshoots it' [Joshi, 1975]. This analysis attributes the sugar and cane cycle mainly to non-price factors, since it cannot see any positive role for price policy in stabilizing the cycle.

On the other hand, the existence of appropriate controls can, in principle, reduce the instability in output. Clearly, however, any explanation of the instability in the cane market must incorporate aspects of both these models; the existence of a time-lagged response, the uncertainty regarding prices for a substantial part of the output, and the role of state intervention in this segment of the market.

Model Three: The problem with the earlier models is that while the former is theoretically sound, its empirical basis is weak, and while the latter is based mainly on empirical observations it does not offer a full explanation of the phenomena. The extent of intervention in both the cane and sugar markets reduces the uncertainty faced by the producers. However, the fact that the sugar industry is not operating within a fully planned economy and not all the output automatically gets consumed, results in a periodic accumulation and reduction of stocks. To the extent that this influences the actual prices received by the producer, either adversely or beneficially with respect to the anticipated prices, it means that some sort of output fluctuation is bound to exist. In India, cane and sugar output instability is a long-standing phenomenon. During the post-Independence period the output of sugar has fluctuated widely, despite the operation of controls. In any case, the nature of such controls has changed over the years.

Assuming that cane is actually processed into only two commodities, *gur* and sugar, the production decision regarding cane is a function of the prices of *gur* (g_p) and sugar (s_p). The demand for cane can be viewed as a purely derived demand and, therefore, as a function of g_p and s_p. In a regime of partial decontrol, s_p is a weighted average of the levy and free-sale price of sugar. The cane grower derives a certain share of the free-sale price of sugar, hence, any increase in the free-sale price, even if the levy price remains constant, would imply an escalation of S_p. The cane price C_p, is itself a weighted average of the price derived from the conversion of cane into *gur* (we have assumed that this is represented by the FHP of cane) and of the SMP or SAP of cane. Thus, the C_p would increase not only on account of an increase in g_p and s_p, induced by an excess demand for *gur* or sugar, but also on account of the escalation in the SMP of cane. Thus, both the sugar price and cane price have a *fix* price and a *flex* price component. Even when the *fix* price is not sensitive to changes in demand, the *flex* price would be.

The *spot flex* price may induce an output level that is not cleared by the *forward flex* price. To complicate matters, if the *fix* price of cane is pushed up in response to the demands of the growers, or on account of the existence of the cooperative sector (see Part VII above), then even the changes in the *fix* price may transmit the wrong production signals to the growers (in terms of the existing demand). Thus, the deviation between supply and demand can come about either on account of purely market determined factors (through changes in the *flex* price of cane) or on account of structural or institutional factors (through changes in the *fix* price of cane).

An important institutional factor that can contribute to the escalation of cane prices is the role of cooperative mills, which are known to offer cane prices to their members higher than the SMP of cane. Even such a price escalation gets transmitted to the other regions through the growers' or peasants' organizations, the various political parties, and so on. A 'wage-drift' argument can be postulated, where the actual prices are not simply market determined, but are institutionally articulated prices. Once the market is confronted with an excess supply problem, or by an excess demand problem, even if the *fix* prices do not adjust in appropriate directions, the *flex* prices tend to adjust. These signals are then transmitted, after a time-lag, and influence the investment decisions. This can be described only as a *modified cobweb* process.

Apart from such purely price-induced signals, whether of the *fix* or *flex* type, there are also important non-price signals which influence the movements in cane, sugar and *gur* output levels. The accumulation of cane arrears, the shortage of bank finance for stock accumulation, the withdrawal or offer of excise rebates, export subsidies, and so on, are all non-price signals that modify the amplitude of the output cycle. Also, the consumer's resistance to price increases in a season of excess demand, and the grower's resistance to price falls in a season of excess supply, are also forms of non-price intervention in the market. These form the upper or lower limits, to price fluctuations and thereby moderate output fluctuations.

In a season of excess supply, when the *flex* prices of *gur* and sugar begin to fall, an effective countermeasure would be to build a buffer stock. (A buffer stock must be distinguished from the normal inventory holding, since it is used as an instrument of intervention in the market.) Such a buffer stock can only be maintained by the government, if such intervention is to be in the interests of 'stability' in both prices and production. Indeed, the role of a buffer stock has long been recognized in the Indian sugar market [GOI, 1965(b), Chapter IX]. However, it was not until after the over-production crisis of 1978-79 that any serious attempt was made in this direction. The current buffer stock of about 5 lakh tonnes is not regarded as adequate to manage a serious crisis of excess demand in the market. Indeed, if the buffer stock is to be seen as an unlimited stock, whose quantum is decided by the excess supply of cane in any given season, then there is no problem of instability, since the government simply buys up all the sugar that is available and the mills crush all the cane that is offered to them.

Another 'price-support' measure in a season of over-production, is the offer of sugar for export. However, even the export of sugar in the case of India involves a sizeable subsidy, since the world price of sugar is in general below the Indian cost of production [APC, (various years)]. Hence, both the maintenance of a buffer stock and the export of sugar entail an expenditure obligation and fiscal burden, which can be quite sizeable in some

years. Again, since such a buffer can be held only in the form of sugar, the buffer stock has to be large enough to induce stability not simply in the sugar market, but also in the market for cane and *gur* as well. It is in this context that the fiscal burden of the buffer stock has to be measured.

Further, the *fix* price of sugar is more or less downwardly rigid. Only the *flex* prices of sugar and *gur* can be reduced. However, even the *flex* price of sugar is normally not allowed to fall below its *fix* price, since the *fix* price is normally a cost-plus price and is fixed as a mark-up over total unit cost. Consequently, the mills resist any reduction in the *fix* price of sugar and the burden of adjustment falls mainly on the cane growers and *gur* producers, since the *gur* price is forced to adjust downwards. In a season of excess supply this rigidity of *fix* prices results in the accumulation of stocks. One way in which the mills compensate for the downward rigidity of the sugar *fix* price is by building up cane arrears. That is, since the mills are not allowed to officially pay a price less than the SMP of cane, they send non-price signals to the growers in a season of excess supply by delaying the payment of the procured cane. The accumulation of cane arrears plays a dual role. First, it warns growers to allocate less land for cane in the subsequent season, and secondly, it leaves the funds for financing the accumulated stocks at the disposal of the sugar mill. In other words, cane arrears act as a form of trade credit for the mills, who pass on the burden of excess supply to the cane grower [Ghosh, 1979].

Apart from these price and non-price signals transmitted by the mills, the non-mill users of cane also transmit price signals to the growers, since any softening of the sugar price also helps to soften the *gur* and *khandsari* prices as well, given the price and cross-price elasticities of sugar and *gur*. What is then the mechanism of adjustment in a *fix-flex* modified cobweb model and on whom does the burden of adjustment fall? It appears that the mechanism of adjustment occurs through changes in the *flex* price of cane and sugar, and that the burden of such change falls essentially on the growers.

In a modified *fix-flex* model, price adjustment can occur only within limits, and quantity

adjustments are forced onto the producers through both price and non-price signals. Further, raw material market is not a single market with a single *fix*-price, but is a segmented, *fix-flex* market, so output adjustments take place, through a delayed payment of *fix* price, or simply through a reduction in the *flex* price. Even if the SMP of cane was not reduced, the additional sugar price and the price secured from *gur* would fall, and thereby help to bring about a reduction in the cane area, the *flex* price having two different components; the *gur* price and the 'free-sale' price of sugar. Thus, the changes in the total realisation from cane, even when the SMP is fixed, influence the output trend in cane. Moreover, the maintenance of a *gur* buffer is not a feasible proposition, not only because of the decentralized and home-based nature of *gur* production, but also because *gur* cannot be stored for long periods of time.

Empirical Evidence

The available empirical evidence establishes beyond doubt the existence of cyclical fluctuations in cane and sugar in the recent past. In analysing these trends in price and output movements one must distinguish between short-period factors and long-period factors, and between market-induced trends and non-market trends. As a result of an escalation in sugar prices and the changes in the method of calculating the SMP of cane in 1967-68 (after the partial decontrol of sugar prices was introduced) both cane output and sugar output increased over the next three years. In 1969-70 sugar production was at the then all-time peak of nearly 43 lakh tonnes (almost double the trough year output of 21.51 lakh tonnes registered in 1966-67). Sugar prices in the open-market then began to decline (the open-market wholesale price of sugar fell from over Rs 280 per quintal to less than Rs 180 per quintal between 1968-69 and 1970-71), leading the government to switch to the full decontrol of sugar price. The mills utilised this opportunity to build up stocks and ease the excess supply in the market. Sugar stocks of up to 20 lakh tonnes were built up and about 8 lakh tonnes of sugar were exported during 1969-70 to 1971-72. Over the

next two seasons sugar output declined to 31 lakh tonnes. This was followed by a second cycle, which peaked at 48 lakh tonnes in 1974-75. A third cycle peaked at 64.61 lakh tonnes in 1977-78, and the fourth at 84.37 lakh tonnes in 1981-82. From these trends it is clear that the cycle's duration need not be constant. The duration can span from 3 to 5 years, with the amplitude of the fluctuation also varying.

In 1974-75, a peak output year, sugar stocks were exported in large quantities because the world price of sugar was extremely favourable to India [Nayyar, 1976]. This helped both to reduce the burden of stock holding on the mills and modified the downswing of the production cycle so that per capita consumption did not decline through the cycle. The management of the next peak, of 1978-79, was disastrous. The decision to decontrol prices and to stop the system of regulated monthly releases worsened the impact of the over-production crisis, resulting in a sharp decline in sugar and cane output in the subsequent year. While in 1978-79 India exported sugar amounting to 8.63 lakh tonnes, it imported nearly 4 lakh tonnes of sugar in 1979-80 and 1980-81.

Such variations in the actual course of a cycle - the magnitude of over-production or under-production, the extent of price rises and so on - are bound to exist in a *fix-flex* modified cobweb situation, since a variety of non-price or even non-economic variables influence the actual course of events. For one thing, the general tendency in favour of offering higher cane prices, which is a distinct phenomenon of the 1970s, has had an impact on the output cycle. It is possible to see the major over-production crisis of 1978-79, followed very soon by another season of over-production in 1982-83, as a culmination of this process. The subsequent decline in sugarcane and sugar output can be attributed to the fact that in recent years the State Advised Prices have not departed very markedly from the SMP of cane. The caution with which state governments have reacted to the demands for a higher cane price may well have dampened producer's expectations and moderated the output cycle.

It is clear that the structure of the sugar market, the sugar mill industry and of sugarcane cultivation impinge upon the processes of cyclical

fluctuation. The problem of output and price instability is inextricably linked to the cost structure of the cane and sugar economies (the ability of the grower and miller to cushion price falls), the structure of demand (the willingness of the consumer to accept a price escalation), and the ability of the government to intervene in the production and trade spheres (in offering subsidies, protecting profit margins or maintaining buffer stocks). The effectiveness with which the state can intervene would then largely depend on its ability to mutually satisfy a variety of pressure groups without coming up against fiscal barriers.

The Argument

The modified cobweb explanation of output fluctuations in cane and sugar production, illustrates how output fluctuations continue to occur even when state intervention has attempted to eliminate the 'uncertainty' and 'risk' of the cane and sugar markets through offering minimum 'cost-plus' prices (for part of the cane and sugar output), and by maintaining buffer stocks or by providing finance for the stock holding of the mills, and so on. Despite the fact that it has been sought to induce stabilities into the cane and sugar economies through a price policy, non-price factors have to an extent neutralized the stabilizing effect of such price intervention. The interaction between output, price and non-price factors (for example, the cane arrears) produces this modified cobweb cycle. Since non-price factors do not, or at least, need not, bear any systematic relationship to the output, such output fluctuations are not regular, but uneven.

To the extent that the non-price factors are seen as structural, institutional, and historically specific, each output cycle traces a course which is different from the previous cycle. For instance, the amount of cane arrears that the mills are allowed to accumulate depends upon political considerations, such as the proximity to an election, the law and order implications of an actual or potential growers' agitation, the ability of the political party in power in a cane-growing state to enforce its will upon the mills, and so on. Similarly, the extent to which the government can stabilize the sugar market would for instance,

(apart from political factors, like the proximity to an election) depend upon the fiscal feasibility of subsidized exports or foreign exchange-depleting imports and the ability to finance a buffer stock large enough to keep speculative activity under check.

Apart from such short-term considerations, there are other long-term elements which also influence the character of a cycle, and which distinguish one crisis from another. These are institutional or structural factors, like the increasing share of the cooperative mills in sugar output, the changing 'class' character of the cane-growing peasantry, and so on. The effectiveness of state intervention is then determined by the extent to which the government is willing to alter, and is capable of altering, the price and non-price signals in order to thereby attain stability in output and price.

The current explanation is a historically specific one. It pertains to a particular phase in the evolution of the sugar economy in India, and is relevant to a structure that is characterized by wide variations in the cost of production, the existence of a powerful growers' lobby, and the unwillingness of the vocal urban, middle and upper classes to accept a steep rise in sugar prices. It is also specific to a structure in which a large part of the raw material is still processed by an unorganized and decentralized processing sector which is not amenable to effective state regulation, and where 'local political' pressures keep alive an obsolete and 'sick' manufacturing sector whose high unit costs push up the 'controlled price' of sugar, thereby imposing a much higher floor to the sugar prices in seasons of over-production.

Thus this explanation pertains to a price regime in which the upper and lower bounds to price movements are narrowly defined, as regards sugar and the mill demand for cane. In the case of cane, the upper bound is defined by the inability of the private sector mills, particularly the less efficient mills in the sub-tropical region, to pay a cane price beyond the limits imposed by these mills' notional profit margins. The lower bound is defined, on the one hand, by the organized, sugar cooperative cane growers, and on the other, by the competition from the non-mill processors,

of cane in a trough output year. In the case of sugar, the upper bound to prices is specified by the resistance of the vocal urban and semi-urban consumers to further price hikes, while the lower bound is determined by the profit margins that mills in general, and the high cost ones in particular, wish to protect.

Within these limits imposed by non-price factors, price changes can determine the course, the span, and the amplitude, of a cycle. Needless to say, the upper and lower bounds to price intervention are not rigidly defined, nor are they static. They are defined, from time to time, by the extant political environment and the willingness or ability of the various participants to accept or concede certain economic penalties or rewards.

There are few other industries in the country in which the inter-play of the various economic and social factors (both urban and rural, industrial and agricultural, producer and consumer), is so vivid and so illuminating of the economic and political dynamics of industrialization.

ABBREVIATIONS

A.S.I.	Annual Survey of Industries.
AISMA	South Indian Sugar Mills' Association.
APC	Agricultural Prices Commission.
BICP	Bureau of Industrial Costs and Prices.
CSAB	Central Sugar Advisory Board.
DCSI	Development Council for Sugar Industries.
DSFA	Deccan Sugar Factories Association.
FHP	Farm Harvest Price.
GOI	Government of India.
ICAR	Imperial Council of Agricultural Research now Indian Council of Agricultural Research.
ICSC	Indian Central Sugarcane Committee, Government of India.
IFCI	Industrial Finance Corporation of India.
IIST	Imperial Institute of Sugar Technology.
ISMA	Indian Sugar Mills' Association.
ISPA	Indian Sugar Producers' Association.
ISS	Indian Sugar Syndicate.
ITB	Indian Tariff Board.
LIC	Life Insurance Corporation.
m.e.s.	minimum efficient scale.
NFCSF	National Federation of Cooperative Sugar Factories, Ltd.
NMML	Nehru Memorial Museum and Library.
NSF	Nizam Sugar Factory.
NSS	National Sample Survey.
RPP	Rajendra Prasad Papers.
SAP	State Advised Price.
SEC	Sugar Enquiry Commission, 1965.
SIEC	Sugar Industry Enquiry commission, 1974.
SISMA	South Indian Sugar Mills' Association.
SISTA	South Indian Sugar Technologists' Association.

SMP	Statutory Minimum Price for Cane.
tcd.	tonnes of cane crushed per day.
U.P.	Uttar Pradesh.
WHC.	Walchand Hira Chand Papers.

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FOOD CONSUMPTION TRENDS IN INDIA: TOWARDS A BETTER QUALITY OF DIET?

J.V. Meenakshi

This study highlights four major trends in food consumption in India. First, Engel's Law has operated in all regions. Second, the share of cereals in food expenditures has decreased despite a relative cheapening of cereals. Third, the quantity of cereals consumed has declined--this decrease is more pronounced among the richer quartiles, but it is not confined to them. Finally, consumers-both rich and poor--have switched away from the cheaper coarse cereals into the more expensive wheat and rice. This has translated into a more diversified diet, and indicates that consumers are making choices of quality over quantity at lower levels of income than one might expect.

It is now a common observation that cereal consumption levels per capita in rural India have declined despite modest increases in income. Between 1972-73 and 1987-88, according to the National Sample Survey data, the average consumption of cereals in rural areas declined from 15.3 to 14.5 kilograms per capita per month. It remained roughly unchanged in urban areas at 11.2 kilograms per capita per month. That this should have happened (a) with relatively low levels of per capita consumption, and (b) at a time when the rate of growth in cereal production has exceeded population growth rates is a paradox that is yet unsatisfactorily resolved.[1]

A decline in cereal consumption could have occurred if income distribution had changed in favour of those who consume lower quantities of cereals. Empirically, however, changes in income distribution have not been significant enough to influence average per capita consumption: the Gini coefficient was relatively unchanged between 1972-73 and 1987-88 in both rural and urban areas [Tendulkar and Jain, 1995].

It is also possible that cereal consumption among the poor has actually increased-- and that the declining average is merely a reflection of a rapid substitution away from cereals among the rich. Finally, a declining national average may also be an artefact of aggregation across regions.

The *first* objective of this study is, therefore, to establish whether the decline in cereal consumption in rural India is in fact an algebraic artefact. Unlike most other studies, it examines trends in consumption by *region* and by *quartile expenditure group*. This not only minimises aggregation biases, but also helps in understanding the changes in food habits of the poorest 25 per cent of the population, who are presumably unable to meet their calorie requirements.

A *second* objective of this study is to understand more fully the nature of change in the composition of foods in the diet, and its implications for the extent of hunger in the country. In particular, it focuses on the substitutions between cereals and other foods, as well as substitutions among cereals.

With economic development, certain changes in food habits come to be expected. For instance:

* According to Engel's Law, economic development is accompanied by declining food shares.

* By Bennett's Law, consumers typically switch to a more expensive diet, substituting quality for quantity. In particular, the starchy-staple ratio--the proportion of food calories derived from the cheaper sources of calories, namely, cereals and roots and tubers--declines with economic growth. Correspondingly, the contribution of commodities such as vegetables and fruits, milk and meat would increase. Bennett argued that 'General economic development and change in the composition of regional diets... in the direction of wider variety and greater expense, go hand in hand and are not separable one from the other' [Bennett, 1954, p. 33].

* An extension of Bennett's Law, more applicable to developing country situations, states that substitutions *within* the starchy staples

(principally cereals) toward the more expensive cereals is likely to occur before the switch away from cereals to the non-cereal foods. In the Indian context, this would translate into a switch away from the coarse cereals to either wheat or rice, or both [Poleman, 1981, Pp. 1-58].

Evidence of such substitutions can be interpreted as indicative of perceived nutritional adequacy. It is likely that dietary changes as suggested by Bennett's Law and its extension are occurring among the richer income groups in India. However given the high incidence of poverty, for the poorest quartile one would expect that increased incomes are being spent on the cheapest sources of calories: the cereals.

To minimise aggregation biases, the country is divided into six regions, based on geographic location, agroclimatic conditions and cropping pattern. These are: Northern, Central, Western, Eastern, Southern; one state, Uttar Pradesh is treated as a region in itself. Table 1 sets out the regional classification, along with some summary indicators.

TABLE 1. REGIONAL SPECIFICATION AND SUMMARY INDICATORS

	State	Per capita Cereal Production, Early 1990s (kg/year)	Per capita Cereal Consumption, 1987-88 (kg/capita/month)	Rural Population Growth Rates, 67-68 to 92-93 (per cent)
Northern	*Haryana* Himachal Pradesh *Jammu and Kashmir* *Punjab*	877	14.5	1.97
Uttar Pradesh		298	15.3	1.90
Central	*Madhya Pradesh* *Rajasthan*	265	15.9	2.11
Western	*Gujarat* *Karnataka* *Maharashtra* Goa	198	13.0	1.72
Eastern	Andaman Islands Arunachal Pradesh Assam *Bihar* Manipur Meghalaya Mizoram Nagaland *Orissa* Sikkim Tripura *West Bengal*	184	15.4	1.96
Southern	*Andhra Pradesh* *Kerala* Lakshadweep Pondecherry *Tamil Nadu*	185	12.8	1.38
All-India		257	14.5	1.98

Note: The number of states used in the construction of regions for the analysis of consumption is somewhat smaller, these are denoted in italics.
Sources: Computed from: Ministry of Agriculture, *Estimates of Area and Production of Principal Crops* (various issues); *Sarvekshana* (various issues) and *Census of India* (various issues).

1. DATA

The study considers trends in food consumption during the fifteen years ending in 1987-88. The data are taken from the National Sample Survey Organization's (hereafter NSSO) household surveys on consumer expenditure. For rural India, these correspond to the years 1972-73 (27th round), 1977-78 (32nd round), 1983 (38th round), 1986-87 (42nd round) and 1987-88 (43rd round); and for urban India, to the years 1972-73 (27th round), 1973-74 (28th round), 1977-78 (32nd round), 1983 (38th round), and 1987-88 (43rd round). Among these, 1972-73 and 1987-88 were years that were agriculturally poor: foodgrain production at the all-India level in these years was, respectively, 7 and 10 per cent below the trend. There were, of course, regional differences in the extent of production deficit: the Western and Central states were more seriously affected than other regions of India.

Quartile-specific consumption and expenditure for each state are estimated using simple linear interpolation. Regional estimates are then calculated as a population-weighted average of the respective states' consumption/expenditure.

Before examining consumption trends, a word on the quality of data is in order. In principle, food consumption includes purchases, home grown stock, receipt in exchange for goods and services, charity and so on. To avoid double-counting, transfers of uncooked food are accounted for in the recipient household, but not in that of the giver. The treatment of cooked meals is different. Here the practice is to include cooked meals in the consumption of the employer household, but not in that of recipient (employee) household. To the extent that more low-income[2] households are likely to eat out and high-income households are likely to have non-family members share their meals, the consumption of the richer households is overstated relative to that of poorer households.[3]

A criticism has been made that the sampling procedure adopted results in very few households belonging to the upper income groups being surveyed. This implies that estimates of consumption of the very rich have high associated standard errors. In response to this criticism, the sampling design was modified somewhat in the 43rd round (1987-88) to ensure a 'sufficient' number of upper income households [see Sarvekshana, July-September 1991].

The food consumption data published by the NSSO are aggregated over different varieties and grades of the same cereal. It is not possible to distinguish the consumption of basmati rice, say, from that of inferior grades of rice. Therefore, if there have been systematic substitutions within different grades or qualities of the same cereal, it is not possible to identify them. It is also not possible to distinguish food intakes of individual members of the household.

2. FOOD CONSUMPTION TRENDS IN RURAL INDIA

2.1 Engel's Law[4]

Table 2 presents the share of food in total expenditures on average, and for the poorest and richest quartiles. It is apparent that the fifteen years ending in 1987-88 have seen a steady decline in the food share--from about 73 per cent to 64 per cent at the all-India level.

This decrease has occurred in all regions, with the magnitude of the decrease between 5-10 percentage points. More importantly, perhaps, food shares have declined for all income groups, including the first (poorest) quartile. In fact, the magnitude of the decline for the first quartile was relatively higher than that for the fourth (richest) quartile. Thus, there has been a tendency towards equalizing food shares across expenditure groups, although the poor still devote much higher shares of their income to food as compared to the rich.

Engel's law is clearly manifest within each cross section: food shares are an inverse function of income. But Engel effects are evident even over time, and for all quartiles. The decreased importance of food items in the consumer budget has occurred despite a relative cheapening of food items and must therefore be attributed to increased incomes: the price of food items relative to non-food items declined from about 1.08 in 1972-73 to 0.87 in 1987-88 [Computed from Jain and Minhas 1991; Tendulkar and Jain 1993].

TABLE 2. THE SHARE OF FOOD IN TOTAL EXPENDITURES, 1972-73 AND 1987-88.

(per cent)

	Rural		Urban	
	1972-73	1987-88	1972-73	1987-88
All India				
Average	72.8	63.8	64.5	55.9
First quartile	82.2	74.0	78.0	70.6
Fourth quartile	63.1	52.7	54.7	51.0
Northern				
Average	65.0	59.4	62.2	56.6
First quartile	76.6	70.7	73.4	67.9
Fourth quartile	53.4	50.3	52.9	50.3
Uttar Pradesh				
Average	70.1	62.2	66.2	57.2
First quartile	80.1	71.8	78.2	69.2
Fourth quartile	59.0	55.3	55.5	52.5
Central				
Average	72.9	63.2	64.0	56.7
First quartile	84.1	70.3	78.8	70.2
Fourth quartile	63.8	55.7	54.5	51.3
Western				
Average	71.0	60.4	65.5	57.2
First quartile	81.0	70.8	78.0	70.1
Fourth quartile	58.2	51.5	55.9	52.2
Eastern				
Average	77.4	70.0	66.2	60.1
First quartile	84.1	65.0	79.6	75.1
Fourth quartile	70.2	62.5	57.1	55.1
Southern				
Average	42.1	36.6	65.5	54.4
First quartile	47.6	41.9	77.5	69.9
Fourth quartile	36.0	32.1	56.3	49.2

Source: Computed from data in *Sarvekshana* (various issues).

2.2 *Bennett's Law*

There are clear indications that the dietary changes which have come to be known as Bennett's law have occurred in India as well. This is apparent from Table 3, which presents changes in the composition of food expenditures, by region and expenditure group.[5]

There are important differences in commodity shares among the various regions. The cereal share, for example, is the lowest in the Northern states (26 per cent), and the highest in the Eastern states (55 per cent) in 1987-88. This is not surprising, given that the Eastern states are among the poorest in India, while the Northern states are among the richest. According to estimates provided by the Expert Group on Estimation of Proportion and Number of Poor [Planning Commission, 1993], the states of Orissa, Bihar and West Bengal--all in the Eastern region-- ranked the highest among the 25 states in terms of the percentage of rural poor in 1987-88. Punjab, Haryana and Himachal Pradesh--three of the four states that constitute the Northern region--had the lowest percentage of rural poverty in 1987-88. Similarly, while the Northern states devoted the highest shares of food expenditures to milk and meat products[6] (one-third), consumers in the Eastern and Southern regions only spent 12 to 13 per cent on this commodity group. What is common to all regions, however, is that over time the share of cereals in total food expenditure has steadily declined, while the relative shares of milk and meat products, vegetables and fruits, and other foods have steadily increased.[7]

TABLE 3. COMPOSITION OF FOOD EXPENDITURES, 1972-73 AND 1987-88: RURAL INDIA

(per cent)

	Cereals		Milk and Meat		Vegetables & Fruits		Other Foods	
	1972-73 (1)	1987-88 (2)	1972-73 (3)	1987-88 (4)	1972-73 (5)	1987-88 (6)	1972-73 (7)	1987-88 (8)
Northern: Average	35	26	30	33	6	9	29	31
First Quartile	44	35	21	23	6	9	29	34
Fourth Quartile	29	21	35	38	6	10	30	32
Uttar Pradesh: Average	58	39	15	20	7	10	20	31
First Quartile	69	54	7	9	7	9	17	28
Fourth Quartile	47	30	21	28	7	10	24	33
Central: Average	56	40	17	22	5	8	23	30
First Quartile	73	56	9	10	4	8	15	26
Fourth Quartile	43	30	23	29	5	9	29	33
Western: Average	56	31	11	16	6	12	27	40
First Quartile	63	42	7	12	6	12	24	34
Fourth Quartile	48	28	15	22	7	13	30	37
Eastern: Average	66	55	9	13	7	10	18	22
First Quartile	74	78	3	7	7	12	17	16
Fourth Quartile	55	45	14	19	9	11	23	25
Southern: Average	58	44	10	12	7	11	26	34
First Quartile	68	56	5	6	6	10	22	29
Fourth Quartile	48	35	14	16	8	12	30	36

Note: Columns 1, 3, 5 and 7; and 2, 4, 6 and 8 may not sum to 100, respectively, due to rounding errors.
Source: Computed from data in *Sarvekshana* (various issues).

This switch has occurred even among the poorer income groups: the share of cereals in total foods for the poorest 25 per cent of the population in rural India decreased in all regions, with the decrease being the smallest in the Eastern region. At the same time, the share devoted to milk and meat products, and vegetables and fruits increased.

There are of course differences in individual commodity shares among various expenditure groups. The poorest 25 per cent devote much higher shares to cereals than do the richest 25 per cent. Similarly, while the poor spend between 5 and 10 per cent of total food expenditures on milk and meat products (except in Northern India), the richest 25 per cent devote more than twice as much. The share of vegetables and fruits is nearly identical among all income groups. Thus while the poor continue to be the most vulnerable to erosion of purchasing power through inflation in cereal prices, the extent of this vulnerability appears to be declining over time.

What is also important to note is that these substitutions away from cereals have occurred at a time when the relative price of milk and milk products, meat and fish, and fruits and vegetables *vis-a-vis* cereals has been increasing, as indicated below:

	Relative Price with respect to Cereals:	
	1972-73	1987-88
Milk and milk products	1.0	1.5
Meat and fish	0.9	1.4
Fruits and vegetables	0.9	1.9

Source: Computed from Jain and Minhas [1991] and Tendulkar and Jain [1933].

The movement in food shares has therefore been towards the relatively more expensive commodities. This suggests that income effects, along the lines suggested by Bennett, are quite strong, and evident even among the lower income groups.

2.3 Trends in Per Capita Consumption of Cereals

Apart from an across-the-board decrease in the cereal share, the quantity of cereals consumed has also exhibited a systematic decline. Furthermore, important commodity substitutions have occurred within the cereal group—the fifteen years ending 1987-88 have seen substitutions away from the cheaper but inferior coarse cereals into rice and wheat. This broad trend holds surprisingly true for both the rich and the poor; and is often not correlated with movements in

relative prices of cereals.

Consider the evidence in Tables 4 and 5. Table 4 presents the consumption of rice, wheat and coarse cereals by quartile group. Coarse cereal consumption is derived as a residual, subtracting rice and wheat from total cereal consumption. The last columns of Tables 4 and 5 present trends in implicit prices (relative to wheat) over the same period. These prices have been derived by dividing expenditures by quantities.

There are no major differences in the trend in relative prices faced by the different quartiles, although the magnitude of increase or decrease does vary; therefore the last columns of Tables 4 and 5 depict trends in prices only on average; prices for each quartile are not presented.

At the all-India level, per capita consumption of cereals has declined from 15.3 to 14.5 kilograms per month over the fifteen year period. The decline among the richest income group was much greater, from 20 to 17.4 kilograms per capita per month (hereafter pcpm), while the poorest income groups essentially maintained their consumption at 11.2 to 11.5 kilograms

pcpm.

The decline in per capita consumption of cereals is entirely attributable to a decline in coarse cereal consumption, down from 4.8 to 2.5 kilograms pcpm. An increase in wheat consumption from 3.9 to 4.9 kilograms pcpm was not enough to compensate for the decline in total cereal consumption. The consumption of rice remained virtually unchanged during this period. The substitution away from coarse cereals into rice was particularly pronounced in the lower income groups, while the richest quartile experienced almost no change in the consumption of rice and wheat, only a decline in coarse cereals. This is probably because the richer income groups already consume fairly high quantities of wheat.

It is also important to note that the switch from coarse cereals to wheat does not seem to be price induced-- the relative price of other cereals with respect to wheat has remained constant since the 32nd round. The increase in the relative price of rice is, of course, consistent with the increase in wheat consumption.

TABLE 4. CONSUMPTION OF CEREALS BY QUARTILE AND RELATIVE PRICES: RURAL INDIA

(kg pcpm)

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	4.75	2.01	4.41	11.17	6.60	3.24	4.82	14.66	7.59	4.15	4.91	16.65
1977-78	4.86	2.15	4.42	11.43	7.05	3.35	4.11	14.51	8.07	4.20	3.93	16.20
1983	4.15	2.32	5.19	11.66	6.48	3.98	3.71	14.17	7.54	4.48	3.51	15.53
1986-87	5.11	3.42	2.72	11.25	7.11	4.15	2.49	13.75	7.96	4.93	2.26	15.15
1987-88	4.95	3.33	3.00	11.28	7.01	4.33	2.52	13.86	7.61	5.21	2.39	15.21

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	8.08	6.82	5.06	19.96	6.59	3.88	4.79	15.26	1.34	0.96
1977-78	8.50	6.48	3.88	18.86	7.12	4.05	4.08	15.25	1.36	0.87
1983	8.48	6.15	3.40	18.03	6.63	4.46	3.71	14.80	1.59	0.86
1986-87	8.25	6.57	2.14	16.96	7.11	4.77	2.40	14.28	1.52	0.89
1987-88	8.07	7.16	2.16	17.39	7.04	4.94	2.49	14.47	1.52	0.86

Note: Consumption in kg per capita per month (pcpm).
Source: Computed from *Sarvekshana* (various issues).

At the all-India level, a comparison with consumption trends during the 1960s is possible, thanks to a 1979 study by P.S. George. According to his calculations, cereal consumption for the poorest quartile was about 11.2 kilograms pcpm in 1961-62, peaked at 11.8 kilograms in 1964-65 and subsequently declined to 11.3 kilograms in the early 1970s. These are similar orders of magnitude to those presented here. Also, the commodity substitutions taking place in the 1970s and 1980s appear to be a continuation of trends found in the 1960s [see also Suryanarayana, 1995].

In the Northern region (Table 5), once again there is a decline in cereal consumption among all income groups, although there seem to be signs of some increase in consumption of wheat among the poorest 25 per cent between 1983 and 1987-88. The decline is largely attributable to a decrease in coarse cereal consumption. There is evidence of commodity substitution towards wheat only among the poorer expenditure groups. The consumption of rice has remained unchanged among the poor and has decreased somewhat among the richer income groups. At first glance, this seems somewhat surprising, given the phenomenal success with rice production in this region during the 1980s. However, apart from strong local taste preferences for wheat, the relative prices of both rice and coarse cereals have been increasing, suggesting that in this region, the commodity substitutions may well have been price-induced.

In Uttar Pradesh, consumption trends are similar to those found in the Northern region: cereal consumption has declined for all income groups, with the greatest decline being experienced by the richest 25 per cent. The decrease in coarse cereal consumption is entirely responsible for the overall decrease in cereal consumption. There was an increase in wheat consumption of nearly 2 kilograms per capita per month both on average and for the first quartile, but there was no secular increase in rice consumption.

However, unlike the case with the northern states, changes in relative prices do not explain the substitution away from coarse cereals: the price of other cereals with respect to wheat has remained unchanged.

The decrease in coarse cereal consumption is particularly pronounced in the Central region, a major consumer of these cereals. Between the 27th and the 43rd rounds, the consumption of these cereals declined more than half to 3.5 kilograms pcpm in 1987-88. There was also a decrease in rice consumption of nearly one kilogram pcpm. The decline occurred in all quartiles, with a partially offsetting increase in wheat consumption, particularly among the poorer quartiles. Wheat consumption for the poorest 25 per cent trebled over a fifteen-year period, from 1.7 kilograms pcpm to 5.9 kilograms pcpm in 1987-88. The total consumption of cereals thus fell by much less than it otherwise would have. On average, 15.9 kilograms pcpm of cereals were consumed in 1987-88 as compared to 17.6 kilograms pcpm in 1972-73. The decrease for the first quartile was somewhat lower: from 13.8 to 12.9 kilograms pcpm over the fifteen-year period.

One reason for the decline in coarse cereal consumption may be the lack of availability of this commodity group. As has been well documented, coarse cereals have not performed well in the post green revolution period-- having lost acreage initially to superior cereals such as wheat and later to oilseeds. However, the lack of availability cannot be the entire explanation, as is evident from the trend in prices. The relative price of other cereals with respect to wheat has increased only slightly since 1983, from 0.84 to about 0.88. This increase is clearly not commensurate with the magnitude of decrease in coarse cereal consumption and/or increase in wheat consumption. Moreover, the decrease in coarse cereal consumption predates the increase in relative price. Clearly, the inferior nature of this commodity group is also responsible for the decrease in its consumption.[8]

In the Western states also, cereal consumption declined: from 13.7 to 13.0 kilograms pcpm between 1972-73 and 1987-88. This is in general true for all income groups, only that the magnitude of decrease is greater for the richest income group. Coarse cereal consumption has declined, but not by as much as that found in other regions, especially the Central region. Once again, it is important to note that the decrease in coarse cereal consumption has occurred despite a decline in its

relative price *vis-a-vis* wheat. There is some increase in the consumption of rice, quite consistent with the observed decline in its relative price.

The Eastern region exhibits quite a different pattern from the other regions, in that it does not seem to have witnessed a decrease in cereal consumption, except in the richest quartile. While the average consumption of cereals has remained roughly constant at approximately 15 kilograms pcpm, cereal consumption among the first and second quartiles has increased. The poorest expenditure groups experienced an increase in consumption from 9.7 to 11.8 kilograms pcpm over the fifteen year period, while the increase for the second quartile was more modest: from 13.7 to 14.6 kilograms pcpm. This region is not a major consumer of coarse cereals, and their importance in the diet is diminishing over time. The increase in cereal consumption among the first quartile has been brought about by increased consumption of

rice (up from 5.1 to 8.3 kilograms pcpm) and to a lesser extent, wheat (from 2 to 2.5 kilograms pcpm). These increases are despite upward movements in the relative price of rice.

In the Southern region, average consumption of cereals does seem to have declined somewhat from 13.4 to 12.8 kilograms pcpm, but consumption of cereals among the first quartile has increased, from 9.8 to 10.5 kilograms pcpm. The consumption of coarse cereals has declined by approximately 2 kilograms pcpm across all expenditure groups, while the consumption of rice has increased in all but the richest expenditure groups. Wheat is not consumed in any significant quantities in these states. The relative price movements once again do not help shed light on why such commodity substitutions should have taken place: in fact, the ratio of rice to other cereal prices would indicate a substitution towards coarse cereals, the relative rice price having increased from 1.5 to 1.7.

TABLE 5. CONSUMPTION OF CEREALS BY REGION AND RELATIVE PRICES: RURAL INDIA

(kg pcpm)

NORTHERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	1.68	7.42	4.65	13.75	2.67	9.12	4.37	16.15	3.46	10.41	4.17	18.03
1977-78	1.77	7.93	2.75	12.45	2.67	9.31	2.71	14.69	3.44	10.13	2.63	16.21
1983	1.92	7.50	1.80	11.22	2.63	9.21	1.87	13.70	2.98	10.13	2.38	15.49
1986-87	2.08	8.51	1.42	12.00	2.67	9.16	1.51	13.34	3.23	10.01	1.65	14.89
1987-88	1.77	8.71	1.42	11.90	2.48	9.75	1.55	13.79	2.79	10.72	1.47	14.98

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	4.28	13.09	3.84	21.21	2.90	9.73	4.29	16.92	1.39	0.86
1977-78	3.91	11.92	2.66	18.49	2.94	9.83	2.55	15.33	1.31	0.96
1983	3.84	12.38	2.49	18.72	2.78	9.83	2.19	14.81	1.49	0.93
1986-87	3.40	11.61	1.68	16.69	2.84	9.69	1.55	14.08	1.62	0.99
1987-88	3.32	12.67	1.32	17.31	2.60	10.45	1.45	14.49	1.61	1.08

(Contd.)

UTTAR PRADESH

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	2.55	6.10	4.96	13.61	3.80	8.08	4.16	16.04	4.51	9.52	3.83	17.86
1977-78	3.32	6.68	3.06	13.06	4.61	8.44	2.66	15.71	5.42	9.34	2.51	17.27
1983	2.44	8.28	1.49	12.21	3.92	9.33	1.37	14.62	4.46	10.31	1.49	16.26
1986-87	3.52	7.78	0.79	12.09	3.57	8.93	1.99	14.49	5.03	10.60	0.98	16.61
1987-88	2.74	7.18	3.11	13.03	4.51	10.08	0.10	14.69	3.81	11.21	0.91	15.93

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	5.68	12.43	3.37	21.48	3.99	8.70	4.14	16.83	1.32	0.82
1977-78	5.68	12.04	2.49	20.21	4.76	9.13	2.68	16.57	1.28	0.85
1983	4.99	13.04	0.99	19.02	3.82	10.20	1.55	15.57	1.52	0.84
1986-87	5.46	12.16	1.13	18.75	4.66	9.87	0.95	15.48	1.49	0.84
1987-88	4.28	12.44	0.92	17.64	3.70	10.59	1.03	15.32	1.51	0.87

CENTRAL

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	4.30	1.75	7.71	13.76	5.53	3.19	8.28	17.00	5.83	5.54	7.21	18.58
1977-78	3.30	2.76	6.96	13.02	4.29	4.67	7.05	16.01	4.61	6.52	6.78	17.92
1983	2.60	3.34	7.40	13.35	4.09	5.11	6.41	15.61	4.88	6.59	5.58	17.06
1986-87	2.90	5.55	4.21	12.66	3.86	6.90	4.26	15.02	4.05	8.37	3.65	16.07
1987-88	3.33	5.94	3.63	12.90	4.56	7.31	3.40	15.26	4.35	10.31	2.01	16.67

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	4.98	9.84	7.51	22.33	5.11	4.79	7.71	17.62	1.15	0.94
1977-78	4.30	10.63	5.77	20.70	4.12	6.15	6.63	16.90	1.24	0.81
1983	4.38	10.16	5.05	19.58	3.99	6.27	6.11	16.37	1.54	0.84
1986-87	3.94	11.93	3.38	19.25	3.69	8.24	3.82	15.76	1.41	0.87
1987-88	4.05	11.45	3.06	18.56	4.07	8.34	3.47	15.88	1.40	0.88

WESTERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	1.44	1.98	6.18	9.60	2.35	2.13	8.58	13.05	2.84	2.47	9.58	14.89
1977-78	1.36	0.55	9.07	10.99	2.33	1.23	9.51	13.07	3.19	2.06	9.39	14.63
1983	1.46	0.60	9.04	11.10	2.69	1.17	9.24	13.10	3.86	1.75	8.95	14.55
1986-87	1.92	1.03	6.32	9.28	2.77	1.79	7.21	11.77	3.60	2.43	7.44	13.47
1987-88	1.88	1.56	7.39	10.83	3.00	2.12	7.41	12.52	3.61	2.41	8.02	14.03

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	4.50	3.24	9.73	17.48	2.50	2.38	8.78	13.67	1.62	1.03
1977-78	4.89	3.40	8.77	17.05	2.91	1.81	9.22	13.93	1.38	0.79
1983	5.11	2.95	8.72	16.78	3.26	1.60	8.98	13.83	1.30	0.67
1986-87	4.87	3.34	6.18	14.39	3.29	2.15	6.58	12.02	1.30	.0.75
1987-88	4.18	3.38	5.86	13.42	3.27	2.46	7.25	12.98	1.34	0.74

EASTERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	5.13	1.96	2.58	9.67	8.87	2.73	2.14	13.74	11.40	3.26	1.73	16.40
1977-78	6.69	2.29	1.64	10.62	10.07	2.95	1.40	14.43	12.11	3.46	1.31	16.88
1983	5.55	2.64	2.63	10.82	8.67	3.66	1.93	14.26	10.82	3.96	1.55	16.33
1986-87	8.16	2.28	0.99	11.42	10.80	2.90	0.65	14.36	12.52	3.39	0.49	16.40
1987-88	8.31	2.50	0.96	11.77	10.96	3.09	0.58	14.64	12.39	3.49	0.43	16.30

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	15.29	4.02	1.50	20.81	9.94	2.95	2.01	14.89	1.20	0.83
1977-78	15.49	4.15	1.08	20.72	11.09	3.21	1.36	15.67	1.25	0.88
1983	13.58	4.69	1.49	19.76	9.62	3.73	1.91	15.26	1.44	0.85
1986-87	14.75	4.37	0.53	19.64	11.56	3.11	0.78	15.44	1.31	0.61
1987-88	14.04	4.26	0.43	18.73	11.43	3.34	0.60	15.36	1.37	0.83

SOUTHERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	5.22	0.15	4.36	9.73	8.19	0.17	4.45	12.80	10.24	0.19	4.27	14.70
1977-78	5.83	0.03	4.36	10.22	8.78	0.11	3.93	12.82	11.00	0.12	3.45	14.57
1983	6.60	0.14	3.61	10.34	9.20	0.24	3.25	12.69	11.04	0.30	2.71	14.06
1986-87	7.05	0.10	2.84	9.99	9.59	0.17	2.50	12.26	10.99	0.34	2.62	13.95
1987-88	7.50	0.08	2.88	10.47	9.76	0.17	2.26	12.19	11.22	0.24	2.71	14.18

Year	4th Quartile				Average				Implicit Price Ratios Rice/ Other Cer.
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	
1972-73	13.61	0.29	4.18	18.08	8.88	0.20	4.33	13.40	1.52
1977-78	13.82	0.35	2.98	17.15	9.86	0.16	3.67	13.69	1.64
1983	14.03	0.61	2.08	16.73	10.18	0.33	2.92	13.42	1.74
1986-87	13.01	0.62	1.31	14.94	10.16	0.31	2.16	12.62	1.91
1987-88	13.22	0.60	1.40	15.22	10.42	0.27	2.11	12.80	1.71

Note: Consumption in kg per capita per month (pcpm).
Source: Computed from *Sarvekshana* (various issues).

3. FOOD CONSUMPTION TRENDS IN URBAN INDIA

The discussion of trends in composition of diet in urban areas presented below is somewhat brief, for consumption patterns here are far more stable than in rural areas, and only serve to reinforce the trends observed in rural India.

3.1 Engel's Law

Here, the trends are nearly identical to those found in rural areas (Table 2). The food share varies significantly across the regions and would appear to be culturally determined. However, over time, the food share has come down--with the decrease in the first quartile typically exceeding that in the fourth.

What is different from rural India is that the urban food share for the fourth quartile exhibits very little variation among the regions--from about 50 to 55 per cent. Also interesting is the fact that while urban food shares are typically lower than rural food shares, by 1987-88, there were virtually no rural-urban differences in the food share of the richest (fourth) quartile in four of the six regions. For India as a whole, the figures are 53 per cent for rural and 51 per cent for urban. The exceptions are the Eastern region where the rural food share is considerably higher than the urban food share and the Southern region, where the reverse holds. In the rest of India, it would appear that the richest 25 per cent of the population devote approximately 50 to 55 per cent of total expenditures to food.

3.2 Bennett's Law

The composition of food expenditures in urban areas (Table 6) is markedly different from that in rural areas: the cereal share is typically lower and the meat and milk share is typically higher in urban India. The trend toward a declining cereal share and an increasing meat and milk share, however, is common to both rural and urban areas. What is noteworthy is that such trends are not as pronounced among the richer quartiles where they might be expected, as they are among the poorer where they are not.

TABLE 6. COMPOSITION OF FOOD EXPENDITURES, 1972-73 AND 1987-88: URBAN INDIA

(per cent)

	Cereals		Milk and Meat		Vegetables & Fruits		Other Foods	
	1972-73 (1)	1987-88 (2)	1972-73 (3)	1987-88 (4)	1972-73 (5)	1987-88 (6)	1972-73 (7)	1987-88 (8
Northern: Average	26	20	30	31	10	13	35	35
First Quartile	36	29	22	23	8	12	33	37
Fourth Quartile	16	15	35	36	13	15	37	34
Uttar Pradesh: Average	39	26	21	24	9	13	31	36
First Quartile	53	41	12	17	8	10	27	32
Fourth Quartile	25	19	27	28	11	14	37	39
Central: Average	38	26	20	26	9	12	34	36
First Quartile	52	40	13	16	7	10	29	34
Fourth Quartile	25	18	30	30	13	14	33	38
Western: Average	33	22	18	23	10	15	38	40
First Quartile	49	34	11	16	7	12	32	38
Fourth Quartile	20	17	23	26	12	16	45	42
Eastern: Average	40	35	18	22	11	13	31	30
First Quartile	59	52	9	11	10	13	23	23
Fourth Quartile	22	23	26	28	12	13	39	35
Southern: Average	43	30	16	20	8	13	33	37
First Quartile	57	43	9	13	7	11	27	33
Fourth Quartile	28	23	21	24	9	14	41	40

Note: Columns 1, 3, 5 and 7, and 2, 4, 6 and 8 may not sum to 100, respectively, due to rounding errors.
Source: Computed from data in *Sarvekshana* (various issues).

The cereal share is the highest in the urban areas of the Eastern and Southern regions and lowest in the Northern. Correspondingly, the share of milk and meat products is the lowest in the Southern region and the highest in the Northern. The share of vegetables and fruits has been increasing in all regions and among all quartiles: in 1987-88 its share was between 10 and 13 per cent for the poorest quartile and between 13 and 16 per cent for the richest. There were no systematic differences among the regions. Once again, urban and rural trends in food composition are similar.

3.3 Trends in Per Capita Consumption of Cereals

Tables 7 and 8 present trends in the quantity of cereals consumed by region and quartile expenditure group. At the all-India level, cereal consumption was constant at about 11.2 to 11.3 kilograms pcpm. Thus the long term trend of decline in average consumption observed in urban areas since 1961-62 [George, 1979] has been arrested. Since 1972-73 there has been some increase in the consumption of rice and wheat, while that of coarse cereals has declined. This substitution within the cereals has occurred in spite of a relative cheapening of the coarse cereals.

There are marked regional contrasts. Average cereal consumption declined in the Northern, Central, Southern and Uttar Pradesh states, and increased somewhat in the Eastern and Western states. In all regions, however, the importance of coarse cereals has decreased relative to that of wheat and rice, despite becoming relatively cheaper (except in Uttar Pradesh). In fact, the coarse cereals have virtually disappeared from the average urban diet in the Northern, Uttar Pradesh, Eastern, and Southern regions.

Trends in average consumption in a region typify trends for most income quartiles. In particular, where average consumption has decreased, the consumption of the first quartile has also decreased or stayed the same; similarly, where average consumption has increased, as in Eastern and Western India, so has that for the first quartile. In both regions, the increase is entirely attributable to greater rice consumption--which became cheaper relative to wheat during the fifteen years ending in 1987-88. It is thus only in two of six regions that the increase in cereal consumption one might have expected among the poorest 25 per cent has, in fact, materialized.

TABLE 7. CONSUMPTION OF CEREALS BY QUARTILE AND RELATIVE PRICES: URBAN INDIA

(kg pcpm)

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	4.34	3.89	1.99	10.22	5.16	4.93	1.62	11.71	5.47	5.41	1.12	12.00
1977-78	4.63	3.32	2.23	10.18	5.66	4.48	1.68	11.82	5.92	5.05	1.41	12.38
1983	4.47	3.62	1.99	10.08	5.63	4.76	1.39	11.78	5.98	5.33	1.07	12.38
1986-87	4.31	4.02	1.69	10.02	5.37	4.60	1.30	11.27	5.79	5.14	1.00	11.93
1987-88	4.89	4.17	1.32	10.38	5.52	4.84	1.00	11.36	5.51	5.25	0.68	11.44

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	4.98	5.73	0.59	11.30	4.94	4.82	1.48	11.24	1.42	1.06
1977-78	5.64	5.28	0.62	11.54	5.38	4.32	1.62	11.32	1.35	0.92
1983	5.82	5.75	0.67	12.24	5.48	4.87	1.27	11.62	1.36	0.86
1986-87	5.88	5.59	0.66	12.13	5.32	4.82	1.16	11.30	1.51	0.82
1987-88	5.47	5.65	0.41	11.53	5.35	4.98	0.86	11.19	1.46	0.80

Note: Consumption in kg per capita per month (pcpm).
Source: Computed from *Sarvekshana* (various issues).

TABLE 8. CONSUMPTION OF CEREALS BY REGION AND RELATIVE PRICES: URBAN INDIA

(kg pcpm)

NORTHERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	1.93	7.71	0.89	10.54	2.31	8.99	0.56	11.86	2.56	9.20	0.46	12.22
1977-78	1.75	8.71	0.70	11.16	2.29	9.20	0.64	12.13	2.54	9.29	0.70	12.53
1983	1.90	7.70	0.52	10.13	3.24	8.74	0.30	12.27	2.40	9.13	0.26	11.79
1986-87	1.73	7.39	0.24	9.36	2.17	8.32	0.29	10.79	2.37	8.77	0.63	11.78
1987-88	2.11	7.73	0.08	9.92	2.56	7.84	0.08	10.48	2.52	8.72	0.12	11.36

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	2.68	9.44	0.36	12.48	2.30	8.67	0.62	11.58	1.12	0.84
1977-78	2.69	9.29	0.28	12.25	2.23	9.06	0.62	11.91	1.00	0.93
1983	2.35	9.51	0.40	12.26	2.49	5.98	3.13	11.60	0.72	0.07
1986-87	3.01	9.71	0.22	12.93	2.29	8.46	0.33	11.07	1.38	0.86
1987-88	2.63	9.14	0.10	11.88	2.46	8.35	0.10	10.90	1.48	1.30

(Contd.)

UTTAR PRADESH

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	1.62	7.67	1.77	11.06	2.37	9.27	0.84	12.48	2.91	9.49	0.46	12.86
1977-78	1.97	7.76	1.32	11.05	2.80	9.18	0.85	12.83	3.12	9.55	0.54	13.21
1983	1.93	8.33	0.41	10.67	2.44	9.36	0.34	12.14	2.84	9.71	0.35	12.90
1986-87	1.77	8.27	0.35	10.39	2.27	8.99	0.31	11.57	2.47	9.43	0.25	12.15
1987-88	1.89	8.81	0.05	10.75	2.20	9.31	0.04	11.55	2.42	9.25	0.03	11.70

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	3.42	9.92	0.26	13.60	2.39	8.86	0.99	12.24	1.42	0.82
1977-78	3.44	10.13	0.24	13.81	2.71	8.92	0.85	12.48	1.31	0.77
1983	3.28	9.87	0.22	13.37	2.62	9.32	0.33	12.27	1.45	0.86
1986-87	2.82	9.60	0.11	12.53	2.33	9.07	0.26	11.66	1.63	0.83
1987-88	2.91	9.56	0.05	12.52	2.36	9.23	0.04	11.63	1.63	1.00

CENTRAL

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	1.57	6.52	3.51	11.60	2.24	8.07	2.95	13.26	2.45	9.18	2.04	13.67
1977-78	1.83	6.24	3.19	11.26	1.96	8.22	2.60	12.78	2.44	8.86	2.46	13.76
1983	1.77	6.81	2.19	10.77	2.18	8.60	1.65	12.44	2.39	9.50	1.09	12.97
1986-87	1.97	7.49	1.93	11.39	2.28	8.49	1.54	12.30	2.61	9.02	1.25	12.88
1987-88	1.77	7.17	2.37	11.31	2.10	9.26	0.97	12.34	2.40	9.53	0.50	12.42

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	2.69	10.12	1.28	14.10	2.22	8.14	2.65	13.01	1.36	0.95
1977-78	2.86	10.20	0.92	13.98	2.18	8.00	2.53	12.71	1.29	0.83
1983	3.36	10.08	0.65	14.08	2.43	8.75	1.41	12.59	1.33	0.84
1986-87	2.89	10.14	0.90	13.94	2.42	8.74	1.41	12.57	1.57	0.79
1987-88	2.63	9.96	0.29	12.88	2.22	9.38	0.63	12.23	1.58	0.83

(Contd.)

WESTERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	1.65	3.76	3.86	9.27	2.66	4.43	3.18	10.27	3.42	4.67	2.35	10.45
1977-78	1.52	2.36	5.55	9.42	2.58	3.35	4.46	10.38	3.48	4.19	3.04	10.71
1983	1.94	2.67	5.15	9.76	3.18	4.07	3.36	10.60	4.35	4.58	2.48	11.41
1986-87	2.16	2.37	4.77	9.29	3.21	3.62	3.47	10.31	4.00	4.41	2.36	10.77
1987-88	2.45	2.93	4.39	9.77	3.43	3.88	3.07	10.37	3.89	4.60	2.02	10.51

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	3.71	4.67	1.44	9.82	2.67	4.30	2.99	9.96	1.58	1.10
1977-78	3.68	4.63	1.47	9.79	2.59	3.39	4.10	10.08	1.55	0.88
1983	4.36	5.07	1.46	10.88	3.45	4.11	3.10	10.65	1.32	0.79
1986-87	4.51	4.90	1.48	10.89	3.46	3.80	3.03	10.29	1.31	0.70
1987-88	4.05	4.94	1.19	10.18	3.46	4.09	2.67	10.21	1.31	0.70

EASTERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	5.98	4.12	0.54	10.65	7.37	4.80	0.27	12.44	7.47	4.91	0.14	12.52
1977-78	6.36	3.32	0.54	10.22	7.99	4.26	0.39	12.63	7.77	4.88	0.25	12.90
1983	6.83	3.82	0.31	10.97	8.35	4.60	0.18	13.13	8.49	4.96	0.11	13.56
1986-87	6.94	3.46	0.43	10.84	8.44	4.21	0.14	12.78	8.73	4.66	0.06	13.45
1987-88	7.85	3.40	0.12	11.37	8.87	3.84	0.07	12.78	8.84	4.06	0.12	13.02

Year	4th Quartile				Average				Implicit Price Ratios	
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Wheat	Other Cer./Wheat
1972-73	7.07	4.91	0.07	12.05	6.88	4.61	0.29	11.78	1.52	0.98
1977-78	7.46	4.77	0.07	12.31	7.35	4.18	0.35	11.88	1.33	1.04
1983	8.38	5.22	0.08	13.68	8.01	4.97	0.17	13.15	1.49	1.02
1986-87	8.36	5.06	0.06	13.47	8.11	4.34	0.17	12.63	1.45	0.82
1987-88	8.08	4.70	0.04	12.82	8.41	4.00	0.09	12.51	1.44	0.92

(Contd.)

SOUTHERN

Year	1st Quartile				2nd Quartile				3rd Quartile			
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals
1972-73	7.96	0.26	1.26	9.48	10.08	0.46	0.84	11.38	11.00	0.66	0.67	12.32
1977-78	8.16	0.20	1.17	9.52	10.61	0.34	0.59	11.54	11.74	0.60	0.54	12.88
1983	7.70	0.23	1.22	9.14	9.83	0.42	0.85	11.10	11.02	0.73	0.63	12.38
1986-87	7.64	0.43	0.98	9.06	9.45	0.57	0.63	10.66	10.32	0.93	0.41	11.66
1987-88	8.28	0.25	0.59	9.13	9.53	0.51	0.31	10.36	10.00	0.87	0.25	11.13

Year	4th Quartile				Average				Implicit Price Ratio
	Rice	Wheat	Other Cereals	Total Cereals	Rice	Wheat	Other Cereals	Total Cereals	Rice/Other Cer.
1972-73	11.25	1.10	0.34	12.69	9.85	0.55	0.84	11.24	1.43
1977-78	11.44	0.94	0.40	12.78	10.30	0.46	0.72	11.48	1.47
1983	11.25	1.26	0.41	12.92	9.94	0.67	0.78	11.39	1.60
1986-87	10.78	1.48	0.27	12.54	9.52	0.84	0.58	10.95	1.81
1987-88	10.41	1.50	0.17	12.08	9.55	0.78	0.33	10.67	1.75

Note: Consumption in kg per capita per month (pcpm).
Source: Computed from Sarvekshana (various issues).

4. CONCLUSIONS AND IMPLICATIONS

A major finding of this study is that the per capita consumption of cereals has declined, not just on average, but also among the poorest 25 per cent of the rural population, in four out of six regions. The exceptions are the Eastern and Southern states, where the first quartile witnessed an increase in the quantity of cereals consumed. While the evidence for Eastern India is consistent with high rates of poverty, that for Southern India is not. A part of the explanation may lie in the fact that the roots and tubers (especially cassava) consumed in parts of Southern India are not adequately captured by the National Sample Survey data. The relationship between the consumption of cereals and roots and tubers merits a separate investigation.

Furthermore, the decline in cereal consumption masks important substitutions: wheat and rice have replaced coarse cereals in the diet in all six regions. Until the late 1980s, coarse cereals were typically less expensive than wheat or rice. Given that the caloric content of wheat, rice and the coarse cereals is nearly the same, this implies that calorie for calorie, the average diet is becoming more expensive. When substitutions into the more expensive non-cereal foods are also considered, the increase in the cost of the average--and in particular the poor person's--diet becomes all the more apparent.

It is interesting to note that the switch towards preferred foods in the diet is occurring at much lower levels of income than one might expect. For instance, that even the poorest 25 per cent in four regions--who are well below the poverty line in most areas and therefore presumably have inadequate nutrition--are making choices in favour of quality over quantity, is contrary to what one might expect.

One resolution to this puzzle would be to argue, as Shah as done, that poor people for reasons associated with status, mimic the taste patterns exhibited by the richer income groups, even if it means less-than-adequate nutrition [Shah, 1983, Pp. 121-148].

Another explanation, and perhaps a better one, is that the existing poverty norm overstates the number of hungry. To the extent that the poorest 25 per cent in four out of six regions in both rural and urban areas are consuming fewer and more expensive cereals, they are presumably closer to perceived nutritional adequacy than the poverty norm would suggest.

In the Eastern and Southern regions of rural India, and the Eastern and Western regions of urban India, however, the poorest 25 per cent have clearly not achieved dietary adequacy. Increased incomes are spent on the cheapest sources of

calories, the cereals; therefore the increase in cereal consumption among the first quartile. It is here, then, that those most vulnerable to chronic hunger are likely to be located. Therefore, efforts to design an effective public distribution system in these states assume particular importance.

The evidence is also consistent with the findings of a study by Minhas [1991], who compares the extent of hunger as measured by the conventional norm versus two behaviourally-derived norms for the year 1983. Of note here is the relative ranking according to one of the two behavioural norms: the percentage of households who report not having obtained at least two meals a day throughout the year (that is, it includes both the chronically and seasonally hungry). For rural India, of the 17 states considered by him, Bihar, Orissa and West Bengal rank the worst, with 37 to 40 per cent of households reporting their inability to obtain at least two meals every day of the year. The Southern states of Andhra Pradesh, Kerala and Tamil Nadu also have high ranking: 10th, 12th and 14th, respectively of the remaining 14 states.

This is *not* to suggest that a more expensive diet has necessarily translated into commensurate gains in health. There continues to be a high incidence of childhood diseases in most parts of the country. Even infant mortality rates appear to bear little relationship, cross-sectionally, with food intake. Also, the benefits of higher calorie intake may be negated to a large extent if there is inadequate sanitation. Water-borne diseases such as diarrhoea are extremely enervating. Without a healthy living environment, increasing food intakes alone may not be enough [Radhakrishna and Narayana, 1993].

Although these issues are outside the scope of this study, there are important implications for both policy and further research. First, a detailed examination of consumer behaviour is a good indicator of where the most needy are located; this has consequences for effective targetting. Second, apart from eliminating chronic hunger through appropriate food policies--be they price interventions or a more effective public distribution system--government must also intervene in the area of health. There is need to understand more clearly the interaction between food intake,

the quality of the diet, and sanitation in determining positive nutritional outcomes. This is essential for the design of effective social safety nets.

NOTES

1. Some of these agricultural surpluses were, of course, used to substitute for imports/food aid.

2. The terms income and expenditure are used interchangeably in this study. Strictly speaking, NSSO figures pertain only to expenditures, not incomes.

3. For the purposes of the Survey, a household is defined as a group of individuals who share a kitchen. Thus, beggars and the homeless are not canvassed. The questionnaire is typically administered to the head of the household. The reference period is the one month preceding the date of the interview.

4. It is not possible to document increases in real income by quartile for each state, for lack of quartile specific deflators at the state-level. However, if total expenditures for the poorest quartile are deflated using state-specific General (all-item) Consumer Price Index computed by Tendulkar and Jain [1993] and Jain and Minhas [1991], it would appear that real expenditure did increase for the poor between 1972-73 and 1987-88 in almost all states, the major exception being Himachal Pradesh.

5. The discussion in this refers to shares in food expenditures, and not to sources of calories. The decline in the share of cereals in total food expenditures is not, strictly speaking, the same as a declining starchy-staple ratio, but is certainly consistent with it.

6. 'Milk and meat' refers to milk and milk products, meat, eggs and fish.

7. Other foods include oil, sugar, salt, spices, pulses and pulse products and beverages.

8. Interestingly, in some areas, there is a trend for coarse cereals to become superior commodities, preferred by the richer income groups. However, at this level of aggregation, this trend is not discernible. At the all-India level, coarse cereals are observed to have negative income elasticities of demand.

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COMPOSITE TEXTILE MILL INDUSTRY: RESPONSES TO THE CHANGED ENVIRONMENT, 1980-1990

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The textile industry of India which laid the foundation for industrialisation in the country was in the grip of sickness from the 1960s. The composite mills in the organised sector of the industry were the most affected section. However, the 1980s was found to be a comparatively better decade for the composite mills. This was due to the favourable changes in the environment, mainly brought about by the liberalisation policies of the government. The study discusses these changes, analyses the responses of the mills and comes to the conclusion that a major restructuring has taken place in the mills during the 1980s, in terms of output composition, product mix, market orientation, modernisation and subcontracting.

THE CHANGED ENVIRONMENT OF COMPOSITE TEXTILE INDUSTRY

The performance of the Indian textile industry appears to be extremely poor compared to its Asian counterparts despite the fact that it is the oldest and the largest manufacturing industry in the country. The industry is more than 150 years old and occupies a central position in the industrial structure of the country by virtue of its size, employment, contribution to the national product, exports and final consumption expenditure. It accounts for about 20 per cent of the industrial production providing employment to about 15 million people and contributing nearly 25 per cent of the total value of exports [Government of India, 1993a]. The structure of the industry is extremely complex with the unorganised hand spinning and hand weaving sectors at the one end and the organised, modern, sophisticated and highly mechanised mill sector at the other. In between, these sectors, fall the small scale power loom sector (unorganised) and the smaller mill sector (organised).

Apart from the poor overall performance of the industry, since the 1960s the organised sector (especially the composite mills) has been passing through successive periods of crisis. A number of attempts were made to explain this phenomenon in academic, official and business circles. The major reasons put forth include stagnancy of demand, skewed income distribution, competition from power looms, inadequate raw cotton availability, obsolescent machinery and controls and regulations on the industry. However, a number of positive changes have taken place in the environment of the mills since the early 1980s. These changes can be classified into: (1) changes in the policy environment; and (2) changes in the market environment.

Changes in the policy environment constitute changes in the macro policy environment and changes in the policy environment specific to textiles. The changes in the macro environment were brought about by the process initiated since the late seventies to move away from the regulatory policy. There has been a considerable relaxation in industrial licensing policy across a large number of industries. Attempts were also made to relax the restrictive clauses in the import of technology and capital. The duty structure on raw materials, components and capital goods was lowered considerably from time to time. The exchange rate policy has also been subject to change over time with an accent on liberalisation. Since 1978, a managed floating system has been brought in and the 1980s witnessed substantial devaluation of the rupee [Narayana and Joseph, 1993].

Up to the sixth Five-Year Plan, the direction of the textile policy was circumscribed by the overall direction of industrial planning as enshrined in the Industrial Policy Resolutions. The Indian textile industry has probably been the most tightly regulated in the world. It was one of the eighteen basic industries which were subject to a complex regime of licensing and controls implied by the Industries (Development and Regulation) Act of

1951. In addition to this, to promote the decentralised sector, weaving capacity in the mill sector was frozen at the existing level in 1956 with expansion permitted only for exports. However, along with the changes in the macro policy environment, policy changes specific to textile industry were also announced. The first among these was the Textile Policy of 1978 followed by the Integrated Textile Policy of 1981. These two policies shifted only marginally from the existing position over the years. Their overall objective was the promotion of exports. Two features of the 1981 policy need special mention. They are: (1) replacement of looms exclusively for purpose of modernisation; and (2) revision of duty structure on man-made fibres and their liberal imports to promote multi-fibre policy. The Textile Policy of 1985 [Government of India, 1985] constitutes a radical departure from the past, with which the Indian textile industry has been more or less liberated from the government intervention in production and marketing. The novel features of this policy were: (1) Removal of barriers to entry and exit. (2) Complete flexibility in the use of cotton and man-made fibres. (3) A better recognition of the export potential of the textile sector. (4) Equal treatment of power loom and hand loom for fiscal purposes. (5) Allowing for the expansion and contraction of installed capacity by existing units.

With these changes, the environment has changed considerably from one of controls to that of liberalisation of capacity, expansion, choice of technology, import of capital and the type of cloth to be produced. Controls on production through reservation of certain products for the hand loom sector and on the stipulated production of hank yarn for this sector are not regarded as serious constraints on profitability and are frequently disregarded by researchers and policy-makers.

The changes in the market environment constituted the changed demographic, sociological and economic conditions which were reflected in the trends in demand, such as: (1) an increase in the per capita and aggregate demand for textiles; (2) a shift towards blended or mixed fabrics; and (3) a sectoral shift in demand towards mill-made cloth [Neetha, 1994].

As a strategy for survival and growth, the textile mills responded in various ways to the changed environment. Consequently a number of changes have taken place within the composite mills. The mills started modernising rapidly so as to produce high value added fabrics and readymade garments to cope with the changed environment. Simultaneously, they started exporting and entering into tie-ups and agreements with foreign companies and stores. In brief, a distinct buoyancy could be seen in the industry after a long period.

RESPONSES OF THE MILLS TO THE CHANGED SITUATION

The responses of the composite textile mills to the changed environment can be identified in terms of changes in output, product mix, level of modernisation, improvement in quality and promotion of exports.

Changes in Output Composition

As a result of increased competition, the mills seem to have decreased the production of cloth and increased the output of yarn. Table 1 shows the production of mill-made cloth and its share in total production over the period 1980-1989.

The cloth output of the composite mills has declined steadily from 4,176 million meters in 1980 to 3,411 million meters in 1985 and to 2,674 million meters in 1989, reducing its share in the total cloth production from 38.4 per cent to 19.9 per cent during 1980-89. Correspondingly, the share of the decentralised sector has shown an increase. The steep fall in total production of cloth by the mills from 4,073 million meters in 1981 to 3,035 million meters in 1982 was presumably the result of the Bombay Mill Strike which led to the closure of a number of mills. Production picked up in 1983 and did not show any trend till 1985. Since 1985, there has been a steady decline when, in fact, the total cloth production showed a marginal increase.

As regards yarn production, separate data for the composite mills are available only till 1984 (Table 2).

TABLE 1. PRODUCTION OF MILL-MADE CLOTH

Year	Mill-Made Cloth (million metres)	Total Cloth Production (million metres)	Percentage Share of Mill-Made Cloth in the Total
1980	4,176	10,873	38.4
1981	4,073	11,145	36.5
1982	3,035	10,514	29.0
1983	3,528	11,534	30.5
1984	3,366	11,835	28.4
1985	3,411	12,427	27.4
1986	3,337	12,775	26.0
1987	3,114	13,117	23.7
1988	2,859	13,188	21.7
1989	2,674	13,452	19.9

Source: *Handbook of Statistics on Cotton Textile Industry*, Indian Cotton Mills Federation (ICMF), 1990.

TABLE 2. PRODUCTION OF YARN BY COMPOSITE AND SPINNING MILLS

Year	Composite Mills			Spinning Mills		
	No. of Mills	Production (million kg)	Average Production	No. of Mills	Production (million kg)	Average Production
1980	291	647	2.22	370	411	1.11
1981	291	578	1.97	400	437	1.09
1982	281	447	1.59	442	511	1.15
1983	280	525	1.88	525	567	1.08
1984	280	541	1.93	595	610	1.02

Source: South Indian Textile Research Association (SITRA), *Annual Report*, 1986.

From the Table, it can be seen that, average production of yarn by composite mills, though showed a decline in 1981 and 1982 (obviously, because of the Bombay Mill Strike), has increased thereafter. At the same time, average production of yarn by spinning mills has been on the decline. The increased emphasis of composite mills on yarn production becomes evident when we analyse the recent trend among composite mills towards modernising their spinning department, as we see later.

The proportion of total yarn consumed by the composite mills decreased substantially due to the reduction in their cloth output. Consequently, there has been an increase in the share of free yarn available for the decentralised sector and exports (Table 3). As is evident, yarn consumption of the mills declined sharply, from 45.18 per cent in 1980 to 29.42 per cent in 1985, to 18.45 per cent

in 1990. As with the production of cloth by the mills, two distinct trends are observable with the consumption of yarn. Yarn consumption by the mills showed a substantial fall of over 100 (161) million kilograms in 1982 over 1980. It picked up in 1983 and did not show much of a trend until 1985. Since 1985, there has been a steady fall in the consumption of yarn by the mills.

The increase in the production of yarn and a decline in cloth production is because, the mills have to compete with the decentralised sector in the production of cloth in which the power looms have an advantage. This distinct advantage to power looms arises owing to their lower cost of production resulting from low wage rates, in the production of low and medium varieties of cloth. However, the domestic yarn market is comparatively less competitive as the organised sector (the mills) is the only supplier. This was further

favoured by the increased demand for yarn from the decentralised sector and the international market. The reasons for spurt in the international market are: (1) The relaxation of the government control on yarn exports. Till 1985, export of yarn was strictly controlled by the government with a view to ensuring supply of yarn to the decentralised sector. With the announcement of the New Textile Policy of 1985, the government relaxed some of these restrictions, which resulted in an increase in yarn export. (2) The trends in the international market. For a long time countries, like Hong Kong, Japan, Germany, Italy, the U.K. and the erstwhile Czechoslovakia, were the bulk exporters of cotton yarn. But the sharp increase

in wage cost and shortage of labour have forced these countries to reduce their spinning capacity, and consequently, they changed into small exporters. Countries, like Greece, Portugal and Spain, which were small exporters have now turned into importers of cotton yarn. The rate of growth in exports of yarn by South Korea and Taiwan has slowed down since the mid-1980s, and the rate of growth of imports increased rapidly. By the end of 1980s, Thailand also had emerged as a yarn importing country [Neetha, 1994]. This shift in the roles has gone in favour of labour surplus economies such as China, Pakistan and India, which to some extent did increase their share of yarn exports.

TABLE 3. PRODUCTION, CONSUMPTION AND DELIVERIES OF COTTON YARN

(million kg)

Year	Spindle point Production	Consumption	Free yarn Availability
1980	1,058	478 (45.18)	580
1981	1,015	426 (41.97)	589
1982	958	317 (33.09)	641
1983	1,092	364 (33.33)	728
1984	1,151	358 (31.10)	793
1985	1,261	371 (29.42)	890
1986	1,257	342 (27.21)	915
1987	1,348	321 (23.81)	1,027
1988	1,297	289 (22.28)	1,008
1989	1,337	277 (20.72)	1,060
1990	1,447	267 (18.45)	1,180

Note: Figures in brackets show the share of consumption in total spindle production.
Source: As in Table 1.

Changes in Product Mix

To take advantage of the changed environment, many mills opted for a change in their product mix. This can be seen from the fibre-wise composition of production and from the types of product produced by the mills. In 1980, in terms of fibre, 83.24 per cent of the total production of the composite mills was cotton fabrics while that of blended or mixed fabrics was only 16.67 per cent. By 1985, the fibre mix changed to 78.19 per cent of cotton fabrics, 21.52 per cent of blended or mixed fabrics and 0.29 per cent of non- cotton

fabrics. In 1989, the share of non-cotton and blended fabrics together was 26 per cent (Table 4). The shift towards non-cotton and mixed textiles is in agreement with the trend in consumer demand for blended or mixed cloth [Neetha, 1994]. While the product mix has changed in favour of blended and non-cotton fabrics, the absolute quantity of production has shown a trend of its own. Whereas, the cotton fabric production showed a dip in 1982, recovery in 1983 and a steady fall since 1985, the blended fabrics showed significant fluctuations in production since 1983.

TABLE 4. PRODUCTION OF FABRICS BY THE MILL SECTOR

Year	Cotton (million metres)	Percentage Share in Total	Blended (million metres)	Percentage to Total	100 per cent Non- Cotton (million metres)	Percentage to Total	Total (million metres)
1980	3,476	83.24	696	16.67	4	0.10	4,176
1981	3,147	77.26	919	22.56	7	0.17	4,073
1982	2,347	77.33	680	22.41	8	0.26	3,035
1983	2,704	76.64	819	23.21	5	0.14	3,528
1984	2,573	76.44	786	23.35	7	0.21	3,366
1985	2,667	78.19	734	21.52	10	0.29	3,411
1986	2,460	73.72	868	26.01	9	0.27	3,337
1987	2,308	74.12	801	25.72	5	0.16	3,114
1988	2,073	72.51	781	27.32	5	0.17	2,859
1989	1,991	74.46	679	25.39	4	0.15	2,674

Source: As in Table 1.

As far as the yarn output is concerned, the proportion of blended and non-cotton yarn in the total yarn output showed a decreasing trend since 1982, but started increasing after 1987 (Table 5).

TABLE 5. PRODUCTION OF DIFFERENT TYPES OF YARN

Year	Cotton Yarn (million kg)	Percentage Share in Total	Blended and 100 per cent Non-cotton (million kg)	Percentage to Total	Total (million kg)
1980	1,058	82.27	228	17.73	1,286
1981	1,015	79.11	268	20.89	1,283
1982	958	81.53	217	18.47	1,175
1983	1,092	83.42	217	16.58	1,309
1984	1,151	85.32	198	14.68	1,349
1985	1,261	87.33	183	12.67	1,444
1986	1,257	84.48	231	15.52	1,488
1987	1,348	85.37	231	14.63	1,579
1988	1,297	83.57	255	16.43	1,552
1989	1,337	83.46	265	16.54	1,602
1990	1,447	82.12	315	17.88	1,762

Source: As in Table 1.

Thus, the shift towards non-cotton and mixed fibre was much less in yarn production than in cloth. In the cloth market, where the mills have to compete with the decentralised sector, particularly the power looms, they have switched over to non-cotton and blended fabrics. However, in the yarn market, where there was a growing demand for cotton yarn from the decentralised sector and export, the shift was less prominent.

Apart from the changed fibre share within cotton textiles, mills decreased the production of coarse varieties and increased the production of higher and medium quality fabrics (Table 6). It is evident that the share of coarse varieties decreased in the total cotton cloth production from 12.11 per cent in 1980 to 10.21 per cent in 1991. However, the share of lower medium (17s-25s) increased as also that of superfine and fine; that of higher medium (medium 26s-40s) decreased. On the whole, however it is possible to notice a shift in production in favour of high quality fabrics.

Among the blended varieties the mills were increasingly concentrating on the production of cotton viscose, cotton polyester, and polyester viscose which were facilitated through large scale modernisation by the installation of automatic looms [Kantilal, 1992].

Along with changes in fibre mix, the mills tended to focus on a product portfolio comprising

of high value added products eliminating product groups where the decentralised sector has a strong presence. The mills seem to focus increasingly on products like speciality yarns, terry-towels, denim, industrial fabrics and high quality cotton fabrics. This has been attributed to the difficulty in marketing certain varieties in the face of stiff competition from power looms [Neetha, 1994].

TABLE 6. PRODUCTION OF DIFFERENT CATEGORIES OF COTTON CLOTH

(million metre)

Year	Coarse Below 17s	Medium 17s-25s	Category Medium 26s-40s	Fine 41s-60s	Superfine 61s & above	Total
1980-81	416(12.11)	879(25.59)	1,948(56.71)	64(1.86)	128(3.73)	3,435
1981-82	320(10.95)	685(23.43)	1,769(60.52)	43(1.47)	106(3.63)	2,923
1982-83	249(11.27)	549(24.85)	1,333(60.34)	23(1.04)	55(2.49)	2,209
1983-84	286(10.58)	669(24.74)	1,559(57.66)	79(2.92)	114(4.20)	2,704
1984-85	277(10.58)	647(24.70)	1,510(57.66)	77(2.94)	108(4.12)	2,619
1985-86	274(10.59)	639(24.70)	1,492(57.67)	76(2.94)	106(4.10)	2,587
1986-87	261(10.57)	610(24.70)	1,424(57.65)	73(2.96)	102(4.13)	2,470
1987-88	236(10.56)	552(24.71)	1,288(57.65)	66(2.95)	92(4.12)	2,234
1988-89	230(11.50)	541(27.05)	1,066(53.30)	75(3.75)	88(4.40)	2,000
1989-90	228(10.30)	518(27.79)	965(53.70)	81(4.35)	72(3.86)	1,864
1990-91	212(10.21)	523(29.55)	868(50.91)	73(4.12)	94(5.31)	1,770

Note: Figures in bracket show percentage to total cloth.
Source: Calculated from *Indian Textile Bulletin* (Various Issues).

Search for New Markets

Edged out from the domestic market by the decentralized sector, the composite mills as a part of their strategy of survival have sought new avenues. Besides specialising in high priced cotton and blended varieties for the domestic market, the new avenues sought by the mills were the readymade garments and export market.

(a) Readymade Garment Industry: The readymade garment industry both in the domestic and export markets has shown a boom in recent years. The total production value of the garment industry has increased from Rs 275 crore in 1982 to Rs 2,470 crore in 1986. The share of readymade garments in total cloth production has increased from 7.1 per cent in 1983-84 to 11.4 per cent in 1988-89 to 18.3 per cent in 1991-92. [Kantilal, 1992].

In 1987, the domestic readymade garment industry was not worth more than Rs 300 crore. However, in 1992 it was valued at over Rs 1,200 crore and has been growing at a phenomenal rate of 30 per cent per year. Equally impressive was its export performance. Within a span of three years exports have more than doubled from Rs 3,000 crore in 1989 to a hefty Rs 6,252 crore in 1992 [Government of India, 1994].

The quantity of fabrics supplied by the mills to the readymade garment industry is not known since the industry is predominantly a decentralised one and data availability is meagre. Estimates of mill-made fabrics used by them ranged between 20 per cent to 40 per cent. An increasing number of mills have gone for direct sales of fabric to garment manufacturers [Kantilal, 1992].

Apart from this, a number of composite mills such as DCM, Morarjee Goculdas, Mafatlal Groups and Bombay Dyeing have already integrated forward into the readymades. Many of them have, in fact, gone in for foreign tie ups. Arvind Mills (USA), Mafatlal (UK), DCM (Italy), etc., are examples. This rush into readymades can be explained by the fierce competition from the power looms, pushing mills to focus on branded wear where they compete by creating brand loyalties. Apart from this, the trends in the export market also enabled the mills to go in for readymades.

(b) Exports: Exports (excluding yarn) by mills have increased during 1980-1990, both in quantity and in value terms. The following Table shows the trend in exports of mill-made cotton textiles in value terms.

TABLE 7. VALUE OF EXPORTS OF MILL-MADE TEXTILES

(Rs Crore)

Year	Cotton Fabrics	Cotton Made Ups	Readymade Garments
1980-81	145.60	63.56	-
1981-82	140.01	61.03	-
1982-83	156.16	85.56	487
1983-84	169.90	44.96	664
1984-85	255.13	68.24	863
1985-86	231.84	55.50	1,064
1986-87	240.14	50.95	1,474
1987-88	302.22	73.27	1,672
1988-89	262.56	99.34	2,392
1989-90	287.77	160.69	3,379
1990-91	310.59	255.36	4,123

Note: Values in Rs Crore (Constant Prices). Export of mill-made cotton textiles in quantity terms is not included in the Table since we have quantity data only for cotton fabrics.
Source: As in Table 1.

No separate data is available on the exports of yarn by the composite mills. However, the data on yarn exports for the organised sector as a whole has shown an increasing trend during this period, particularly after 1989. The government ceiling on yarn exports so as to protect the decentralized sector has affected the total yarn exports to a large extent.

Recently, there has been a big rush for setting up 100 per cent export oriented units by many of

these mills. The annual report published from the Office of the Textile Commissioner, 1993 reveals that about 18 units were referred to the Section of Industrial Approvals for setting up 100 per cent export oriented units in 1990. By 1992, the number of units increased to 70. Some of the composite mills which have set up 100 per cent export oriented units, the type of product to be manufactured and the total investment are shown in Table 8.

TABLE 8. MILLS WITH 100 PER CENT EXPORT ORIENTED UNIT

Name of the mill	Product	Capital Outlay (Rs Crore)
1. Arlington Spg. & Wvg. Mills Ltd	Cotton Fabrics	82.72
2. Arvind Mills	Shirtings/Denim	107.00
3. Century Textiles	Cotton and Blended Yam	65.00
4. Cheslind Textiles	Cotton Yam	46.89
5. DCM Ltd.	Carded and Combed Yam	35.94
6. Madura Coats	Yam	80.00
7. Mafatlal Fine	Knitted Cotton Fabrics	25.00
8. Mafatlal Industries	Knitted Garments	23.50
9. Raghu Spg. & Wvg. Mills	Cotton Terry Towels	6.32

Source: Economic Times (Various Issues).

Large Scale Modernisation

In order to respond to changes in consumer demand and to produce fabrics which could compete with the decentralised sector in the domestic market and producers in the international market, the mills have sought to introduce advanced production technologies. The mills have introduced machineries of various types

with a view to reorganising the product structure. Some processes have received preferential treatment. To name a few, the ring frames, spooling/winding and sizing machines, etc., have undergone a rapid change/conversion to superior types of machinery [Kantilal, 1992]. This has been mainly due to the fact that capital expenditure in these areas have yielded faster returns in terms of quantity and/or quality, a major concern

under circumstances of scarce and costly capital. Data on census of machinery in textile mills and amounts spent on expansion and modernisation, available for the years 1975-1980, are given in Table 9. It is evident that the mills had spent large amounts in modernising their machines with the spinning department getting the first priority followed by weaving, processing and engineering departments. This confirms our earlier observation that the mills have increasingly moved into the production of finer counts of yarn.

TABLE 9. CAPITAL EXPENDITURE BY THE COMPOSITE MILLS OF INDIA

(Rs Crore)

Year	Spinning	Weaving	Processing	Engg.& Others	Total
1975	NA	NA	NA	NA	353
1976	NA	NA	NA	NA	375
1977	175	105	142	NA	421
1978	271	217	168	46	702
1979	314	261	217	92	884
1980	484	317	272	189	1,263
1975-1980*	36.9	26.7	26.7	9.7	100

Note: * percentage share in total expenditure.
Source: Kantilal, 1992.

A study by the Indian Institute of Management, Ahmedabad, reported that in the years 1978-1982, 56.15 per cent of the available resources of the mills was invested in capital expenditure [ATMA, 1985]. The composite mill industry spent approximately 37 per cent of the total expenses on expansion and modernisation of spinning machinery, 27 per cent on weaving machinery and 27 per cent on processing machinery during the period 1975-80.

An Indian Cotton Mills Federation (ICMF) study [1989-90] on mill modernisation based on a sample of 50 mills, 25 each from spinning mills and composite mills, representing 31 per cent of the total sales turnover of the organised sector found that, the addition to installed capacity of spindles and looms by these mills after 1982-83 has been quite insignificant. This signifies that fresh investments of the selected mills has been mostly towards modernisation of their plant and machinery. The annual rate of modernisation was worked out by relating fresh investments in plant and machinery during a year to gross fixed assets (GFA) of the previous year (Table 10).

The Table shows that the pace of modernisation slightly slowed down in 1984-85 and again in 1987-88 and was higher among the spinning mills since 1984-85. The annual average rate of modernisation came to over 14 per cent per annum. A modernisation rate of 7.5 per cent of the annual turnover is prescribed for a unit to remain competitive. During three out of six years, this percentage for the total of the two categories of mills was more or less at the prescribed minimum rate. The average rate of modernisation percentage of annual turnover (1982-83 to 1987-88) has been higher for the composite mills, at 6.7 per cent of the turnover compared to 5.3 per cent for the spinning mills over the period 1982-83 to 1987-88. The study pointed out that a few years ago, spinning departments used to account for about 51 per cent of the industry's total expenditure on modernisation, weaving 22-24 per cent, and processing / finishing/ engineering a share of 25-27 per cent. This is to be expected since any upgradation in weaving technology has to be preceded by the introduction of superior spinning techniques because of the need for strong and superior yarn to withstand the increased speeds on looms.

TABLE 10. RATE OF MODERNISATION IN TEXTILE MILLS

Gross Fixed Assets

(Rs Crore)

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
25 composite mills	510.62	610.85	660.90	733.24	802.68	920.14
25 spinning mills	112.26	141.65	158.11	177.14	204.90	226.32
Total	622.88	752.50	819.01	910.38	1,007.60	1,146.50

Fresh Investment in Plant and Machinery

(Rs Crore)

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
25 composite mills	79.50	98.37	61.34	87.37	110.81	99.60
25 spinning mills	25.25	17.43	17.75	22.32	30.44	28.52
Total	104.75	115.80	79.09	109.69	141.28	128.12 -

Fresh Investment as Percentage of GFA (Rate of Modernisation)

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
25 composite mills	—	19.3	10.0	13.2	15.1	12.4
25 spinning mills	—	15.5	12.5	14.1	17.2	13.9
Total	—	18.6	10.5	13.4	17.2	13.9

Rate of Modernisation as Percentage of Total Annual Turnover

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
25 composite mills	8.0	8.5	4.7	5.8	7.2	5.8
25 spinning mills	7.2	4.7	4.1	4.8	7.4	4.5
Total	7.8	7.5	4.5	5.6	7.3	5.4

Source: *Indian Cotton Mills Federation Journal*, Vol. XXVI, November1989-January 1990.

Table 11 gives some information regarding the extent of modernisation that is taking place in the composite mills in the recent past. It shows that most of the composite mills which had gone for modernisation focused on the spinning department. Of the thirteen mills, which went for modernisation ten mills focused on modernising spindles. This trend towards modernisation of spindles can be explained by the following factors: (1) the increased demand for yarn in the domestic as well as in the export markets; (2) a comparatively less competitive domestic yarn market compared to cloth; and (3) focus of the mills on high quality high valued cloth. The quality of cloth produced by the mill depends upon the quality of yarn. Hence, the production of high quality yarn is a pre-condition for the mills to concentrate on the production of high valued cloth.

The trend towards modernisation was favoured by the liberalised policy of the government. The government assistance for modernisation started with the introduction of the Soft Loan Scheme (SLS) in 1976, which provided concessional finance to the mills. The total sanction under the Scheme till the end of June 1985 amounted to Rs 576 crore, of which roughly 80 per cent was absorbed by the composite mills [Misra, 1992]. To assist mills in undertaking large scale modernisation, the Textile Policy of 1985 recommended the introduction of a Textile Modernisation Fund with a corpus of Rs 750 crore. Accordingly, the fund was introduced in June 1985 and it has disbursed an amount of 771.19 crore rupees till 1993 for 307 mills [Government of India, 1993b].

TABLE 11. TRENDS IN MODERNISATION

Name of the Mill	Process	Product	Capital Outlay during 1992 (Rs Crore)
1. Arvind Polycot	Spinning	Yam	54.00
2. Bharat Vijay Mills	Spinning	Yam	10.00
3. DCM Ltd.	Sinning	Cotton Yam	26.66
4. Jam Shri Ranjithsinghji Spg. & Wvg. Mills	Weaving	Cotton Textiles	28.02
5. JCT	Weaving	Cloth	30.00
6. Khatau Makanji Spg & Wvg Mills Ltd.	Spinning	Yam	35.00
7. Lakshmi Vishnu Textile Mills	Spinning	Yam	13.00
8. Mafatlal Fine	Spinning	Yam	22.50
9. Mafatlal Industries	Spinning	Yam	21.50
10. Morarjee Goculdas	Spinning	Yam	72.00
11. Pasupati Spg. & Wvg. Mills	Spinning	Polyester Viscose Yam	10.00
12. Rajastan Spg. & Wvg. Mills	Spinning	Polyester Viscose Yam	22.93
13. Standard Industries	Weaving	Cloth	48.53

Source: *Economic Times* (Various Issues).

Subcontracting

Subcontracting in textiles which is referred to as 'activity subcontracting'[1] gained momentum after the Bombay Labour Strike in 1982. While the mills remained closed during the prolonged strike, many of the mills subcontracted the work to power looms and sold the cloth in their own name. Till then subcontracting was chiefly used as a means to save labour costs for unreeling the leftover yarn from used bobbins. Faced with the combined problem of severe competition from the power loom sector, recessionary trends in demand for its cloth and inflation, the organized sector used subcontracting as a way out. The economic instability of the period thus forced many mills to reorganise and restructure through subcontracting. Subcontracting would not only be cheaper for the mills but would also help to impart flexibility in its product mix and production programme and obviate high costs of stocks, unutilized labour and capital. A joint study by four Cotton Textile Industry Research Associations revealed that conversion cost of yarn into fabrics was lower for the power loom sector by 25-30 per cent, mainly due to low wage costs. The cost of production of grey fabrics in spite of higher yarn cost for the power loom sector, would be lower by about 5 per cent compared to the mill sector [ATIRA, 1985].

Many mills provide their own yarn and contract its conversion to fabric to power looms paying only conversion charges or the mills purchased

grey cloth and processed and sold it as their own product. Lately, more and more composite mills have been reducing their weaving capacity and concentrating on spinning and processing relying on power looms to augment their regular fabric production.

CONCLUSION

From the above analysis it is clear that major restructuring has taken place in the mills as a response to changes in the environment explained in terms of changes in output composition and product mix, search for new markets, large scale modernisation and subcontracting. The composite mills seem to focus on the elitist segment of the domestic market, the international market and the readymade garment industry which are economically more viable. This was facilitated by large scale modernisation which enabled the mills to have a diversified product mix.

NOTE

1. Production of cloth consists of three activities. Spinning of yarn, weaving of cloth and finishing or processing of the fabric. Since the textile industry can operate at a very low level of technology it is possible for large firms to produce and procure yarn, get it woven in the power looms and process it in specialized printing firms. [For details see Nagaraj, 1984].

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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, and agencies of central and state governments 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. 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.

In the present section we publish:

Report on General Issues Relating to Backward Areas Development, 1981, by the National Committee on the Development of Backward Areas, (Chairman: B. Sivaramanan), Planning Commission, Government of India, New Delhi; Chapter 4.

REPORT ON GENERAL ISSUES RELATING TO BACKWARD AREAS DEVELOPMENT

4. CONCEPT OF BACKWARDNESS

In our country, a very large number of people believe that the area they live and work in is, in some more or less general way "economically backward". Many of them also feel that their requirements have been neglected in the processes of planning. This belief has found expression in the political system and manifests itself in a large number of claims for special treatment put forward by official and non-official organisations. Within the planning system, pleas for taking measure to tackle the problems of backward areas are common in the discussions at the National Development Council, the Planning Commission and the debate in Parliament. Thus, there is widespread public concern about the problem of backward area development.

4.2 There are many reasons for this and one of these is paradoxically, the quickening of the pace of development in the post-independence era. In a stagnant or slowly growing society, regional inequalities inherited from the past may continue but are unlikely to worsen in the ordinary course. Expectations of rapid advancement are not aroused and there is no clear vision of prosperity and plenty against which people can compare their own condition. A quickening in the rate of growth can change all this. As income and production grow expectations rise. The more advanced or more rapidly growing areas of the country set standards of production, consumption and economic diversification which the other areas wish to attain. Inequalities which have been acceptable in a stagnant society now seem invidious and unacceptable because people can see that the prevailing order can be changed. Thus perceptions of backwardness are, to a large extent, a consequence of development.

4.3 The comparison with others can become all pervasive. The people in each area will compare themselves with those in a more advanced area and consider themselves to be backward relative to some area or the other. There are no absolute standards of 'backwardness' as there are no such standards for 'development'. Hence the concept is a relative one and in the ranking of areas, as perceived by them, all but the ones at the top are seen to be 'relatively backward'. In fact, with the internationalisation of developmental issues, the comparison is often with other countries and all areas may consider themselves to be backward, in an international context.

4.4 People's consciousness of the concept of 'backwardness' has been reinforced by the many financial arrangements and schemes that give special treatment to 'backward' areas. Each of these arrangements defines backwardness for its purpose in a particular way. Generally the definitions are so calibrated selectively so as to limit the geographical coverage of the schemes suitably. Thus in the arrangements for fiscal transfers between the Centre and the States, backwardness has been defined in terms of the State income being below the national average. Similarly in the present scheme for concessional finance for industry, industrial backwardness is defined relative to the state average. Since the perception of relative backwardness has become so all pervasive, areas which are excluded in any arrangement feel aggrieved. Hence pressures arise to alter the definitions so as to cover the excluded areas.

The Concept of Backwardness

4.5 The root of the problem lies in the lack of clarity on the concept of backwardness and its relevance for the processes of planned development. In a multi-tier democracy it is also necessary that there should be some degree of consensus behind the specific definitions used to make the concept operational. What is the concept of 'backwardness' appropriate to the process of planned development? The draft Report of the Chakravarty Committee on Backward Areas made some relevant observations on this matter. The Draft Report states: "The purpose of this Committee is to provide an approach towards the formulation of plans for backward areas where backwardness refers not necessarily to poverty but to factors which underlie such poverty" (Draft Report of the Chakravarty Committee on Backward Areas, para 2.3). Later in the report when dealing with the appropriate development strategy for backward areas the Chakravarty Committee emphasised the need to identify the required "directional departures from national strategies".

4.6 The National Committee would agree that what is required is the identification of types of

backwardness that are amenable to planned development. The Draft Report of the Chakravarty Committee does have this emphasis. However, there are certain other important features of the concept of backwardness which need to be made more clear.

4.7 The planning process takes care of themselves that are required for the purposes of general economic development. Within this framework backward areas need special handling in terms of financial and administrative arrangements and institutional support. These arrangements and the support have to be additional to the general structure. In fact, it is this additionality of special additives to take care of problem areas which creates the urge to add further areas to the list. The important point, however, is that the backward area must have a potential for development and there must be some reason for supposing that by detailed planning, administrative and financial support the productivity of the area can be raised. This presumes that the area has potential for growth which at present has not been dealt with satisfactorily. Where there is no potential for growth, the answer, as already indicated in past plans, lies in out-migration. Thus, for purposes of planning, the areas identified as backward must have three key characteristics:-

(a) They must have potential for development;

(b) There must be some inhibiting factor which prevents this potential from being realised; and

(c) There must be a need for special programmes to remove or mitigate the inhibiting factor and realise the full potential for development.

In summary, the concept of backwardness that the National Committee considers relevant for planned development is that an area is backward if it is in need of special measures in order to utilise its development potential to the full. In this context special measures are not merely a question of finance but will involve directional departures or changes in the complex of policies, programmes, technologies and institutional arrangements in the various sectors of development.

Basis for Identification

4.8 The concept of backwardness outlined in the

previous paragraph has to be operationalised in a manner that is least open to disputation and most likely to attract a consensus of agreement. As the Committee sees it, there are broadly two ways of operationalising the concept. The first is to rely on some overall index for ranking areas and treat all areas below some cut off point as backward. The second is to identify problem areas in different categories by specifying the constraints on development that can only be mitigated by special measures. With both approaches it is necessary to specify the geographical unit relevant for purposes of demarcation. In what follows we deal first with the specification of the appropriate geographical unit and then with the two alternative approaches to identification.

Unit of Identification

4.9 The concept of backwardness suggested earlier focusses attention on the need for special measures to realise the potential for development. This requires that the unit should be small enough to ensure a certain homogeneity of condition so that a further differentiation of approach within the area is not necessary. At the same time the unit must be large enough to be suitable for local planning. The special measures identified for each area would have to be implemented mainly by official agencies. Hence the unit chosen must fit into the framework of development administration. A further factor that has to be taken into account is the availability of quantitative data on the indicators chosen for the purposes of identification.

4.10 The district and the block are both suitable from the administrative point of view as they are both recognised levels in the hierarchy of development administration. From the point of view of data availability the position is somewhat better at the district level than at the block level. However, much of the data that is at present being compiled at district level from census enquiries or administrative control mechanisms can also be complied and, in many cases, is being compiled at block level. Block level development administration has been around for a long time and the idea of block level planning has found much favour in recent years. Hence the availability of

data at block level is already improving. In any case improvements in the availability of data at block level are necessary for the purposes of local planning.

4.11 The crucial consideration in choosing between the district and the block as a unit is the need for some physical and socio-economic homogeneity within the base unit. The district in India, is on average, a large unit. There is also a great deal of variation in the size of districts. There are some districts which are very large in size (Bastar with an area of about 39 thousand sq. km) or with a very large population (e.g., 24 Parganas with a population of 8.5 million) or with a variety of physical conditions (e.g., Ratnagiri which has coastal plain as well as hill areas). The potential for development and the measures required to realise this potential will tend to vary greatly within a district. Hence, if the district is chosen as the unit for demarcation, there is danger that the benefit of special measures may accrue largely to the more developed parts of the districts. The development block as a unit is more uniform in size and, because it is smaller than the district, more homogeneous in physical and socio-economic conditions. The National Committee would recommend that the primary unit for the identification of backward areas should be the development block.

Index-based Approach

4.12 The index based approach relies on an overall statistical measure of backwardness which may be used to rank districts/blocks by degree of development. A cut-off point is specified and all districts/blocks below the cut-off point in the ranking are considered backward. Since no single available indicator at district or block level is considered adequate by itself for this purpose, the statistical measure is built from a multiplicity of indicators. Since a number of indicators are used there has to be a procedure for weighting the separate indicators to aggregate them into a single measure. Thus the index based approach requires specification of the following:-

(i) A set of basic indicators;

(ii) A procedure for weighting or aggregating so that these indicators can be reduced to a single measure; and

(iii) a cut-off point below which areas are to be considered backward.

4.13 Many exercises based on the index approach to the identification of backward areas have been attempted. At the national level the most notable is the attempt made in the draft report of the Chakravarty Committee on Backward Areas which is reported in Annexure 4.1 to this Chapter. Several States have attempted index based exercises to identify backward districts/blocks for purpo..s of development planing.

4.14 The principal problem with the index based approach is that there is a great deal of arbitrariness at each one of the three stages listed in para 4.12 above. This arbitrariness leaves much scope for disputation. An excluded area can argue for a different set of basic indictors or weighting systems or cut-off points which would be favourable from its point of view. Hence, even if the approach is accepted as valid, there may be a great deal of difficulty in reaching any agreement on the matter between the various participants in the planning process.

4.15 The set of basic indicators chosen for the construction of the index generally reflects the availability of data. There is rarely any prior consideration of what ought to be measured. Indicators are available. Critical factors are excluded because the relevant data are not available. There is a certain tendency to rely heavily on data from the population census because they are readily available at any required level of disaggregation. When a wider and more representative set of indicators is used, as in the draft report of the Chakravarty Committee, the analysis has to be done at district level since compiled data for lower levels are not readily available.

4.16 From the point of view of the Committee there is a further difficulty in the type of indicators chosen. Generally these indicators reflect the result of a development process rather than the casual (causal) factors which led to the present situation. The Committee has suggested a concept of backwardness which requires the identification of areas in need of special measures to alleviate the constraints on development. It is not all clear

that the types of socio-economic variables used in the index-based exercises reflect this orientation. For instance, in the indicators used in the draft report of the Chakravarty Committee the only ones which reflect constraints of a sort are the length of surfaced roads and the rate of literacy. Even these are not basic constraints in a strict sense and critical factors like rainfall, topography, etc., do not appear in the list of indicators in any direct fashion.

4.17 The aggregation of a variety of indicators into a single measure poses many difficulties. Since the choice of indicators does not necessarily reflect a prior analysis of relevant factors, there is as yet not acceptable method of aggregation. In many cases all the indicators are given equal weight on the principle of ignorance. With this approach some variable which is overrepresented in the set because data are easily available (i.e., literacy) automatically gets a higher weight. In some cases this problem is avoided by giving arbitrary weights to each indicator on the basis of some subjective judgement on the importance of the factors. If there can be some agreement on these judgements the method is workable provided of course that the indicators chosen are relevant.

4.18 A third method that has found favour lately is the method of principal component analysis. Roughly speaking, the method of principal component analysis can be used to reduce on(e) set of indicators to a smaller number of indicators by taking into account the inter-correlation amongst the indicators in the original set. Each of the new and smaller set of indicators can be expressed as a weighted sum of the original indicators, the weights being derived from various arithmetical operations on the correlation matrix. Each of the new set of indicators 'explains' some proportion of the variance in the original data. The method is useful if any one of the new set of indicators (a) explains a substantial proportion of the variance, and (b) has the expected signs on the weights attached to each of the original indicators. There is no guarantee that this will always be the case. For instance, in the exercise reported in the draft report of the Chakravarty Committee the indicator labelled 'backwardness' has a positive (but small) weight

attached to the value of foodgrains output per capita and to the length of surfaced roads per unit area. The positive sign on these two variables is clearly perverse since one cannot argue that the higher the per capita foodgrain output and (t)he more dense the road network the more backward is the area. Thus at the present stage we do not find the method useful and the belief that the principal component method solves the weighting problem is not well-founded.

4.19 The final element in the index based approach is the specification of a cut-off point below which an area is to be deemed as backward. Generally the medium or average value of the index is taken as the cut-off point. There is no sanctity in this assumption. The draft report of the Chakravarty committee has used a more promissing approach in one case. They have identified break-points or gaps in the scores as one proceeds down the ranking and grouped districts into four categories. This four folds classification has the further advantage that it avoids the simplistic dichotomy of area into backward and advanced. However, there is still a great deal of arbitrariness in deciding at which of the many break-points one should place the cut-off level for identifying areas in need of special measures.

4.20 The index-based approach does not classify districts into problem categories and in fact further analysis is required in order to do this. All the districts/areas below the cut-off point do not necessarily have the same problem. A multiple classification of the sort referred to in the previous paragraph may be somewhat better. But here too the problem may not be the same within the each group(sic). There is also no indication that those below the cut-off are all developable and have the requisite potential.

4.21 It could be argued that the problems associated with the index based approach can be avoided by using simple measures like the percentage of population below the poverty line or the rate of unemployment of(r) the value of domestic product per capita in the area. However, there are certain difficulties in accepting this argument.

4.22 Poverty and unemployment may be mainfestations of backwardness but are certainly not causative factors. There are areas which have

to be treated as backward even though they do not show a high poverty percentage or rate of unemployment. A typical example would be the hill areas of the Himalayas which, probably on account of outmigration and remittance incomes, show fairly high levels of per capita consumption and low levels of unemployment. Nevertheless, the Himalayan hill areas are in need of special measures to realise their full potential for development and must, in our view, be treated as backward. Hence, poverty and unemployment are not by themselves indicators of backwardness in the sense in which this term has been understood by this Committee.

4.23 With regard to estimates of domestic product at district/block level, some rudimentary calculations are possible. However, the usefulness of such income estimates is open to question. The income generated in an area is not the same as the income accruing. At a block or district level the difference between these two concepts can be quite substantial. For instance, a block or district in which a very large industrial enterprise is situated will show a high level of income from manufacturing. But a substantial proportion of this income may accrue to people outside the block/district in the form of profits. Similarly a block/district with a large forest area will slow a high level of income from forestry. Here too the bulk of this income may accrue to the State Government rather than to people within the area. Apart from this, there are also some difficulties in defining clearly the income generated within a district from activities like rail transport, power distribution, etc. The Committee has seen one exercise giving estimates of district-level income for the U.P. districts. These estimates put almost all the districts of the hill areas and of Bundelkhand above the State average while Lucknow district falls below the State average. Clearly the estimates, even if they are correct, have failed to identify backward areas in need of special measures to realise their potential for development.

4.24 It has been suggested that instead of using an overall index it may be easier to define sectoral indices to identify backwardness with respect to specific sectors of development, e.g., agricultural backwardness, industrial backwardness, educational backwardness, etc. The Committee feels

that such sectoral indices would also have to face the problem of identifying relevant indicators, aggregating them and defining cut-off points unless there happens to be some single indicator and a well-defined norm on which there is a fair measure of agreement. Moreover, it is not clear that these sectoral indices will help to identify areas in which a wide range of special measures or initiatives will be required for realising the development potential which is really the concept of backward areas the Committee has suggested above. Such indices may be of use in the monitoring of regional inequalities at the sectoral level. In particular the concept of industrial backwardness may have some validity. But as a general answer to the problem of identifying backward areas, the sectoral index approach is not very promising.

4.25 The National Committee has considered carefully the possibility of using an overall index to identify backward areas in the sense in which the concept backwardness has been defined earlier in para 4.7. The Committee had the advantage of examining several studies in this field. The Committee feels that the present position with regard to data availability and the development of methodologies is such that an index based approach to the identification of backward area(s) cannot be recommended. Such an approach will not be able to take into account all the relevant factors in an objective manner and the subjective judgements regarding the choice of indicators, weighting patterns and cut-off points will be open to extensive disputation.

Problem Area Approach

4.26 Earlier in para 4.8 we have talked of two alternative approaches to the problem of identification of backward areas. The first alternative based on an overall index has been examined above and not found to be acceptable. The second approach has been described there as one which tries to identify areas which cannot realise their development potential unless special measures are taken to alleviate certain crucial constraints.

4.27 The term 'problem areas' is somewhat vague and, in an under-developed economy, almost any area can claim to suffer from some

deficiency that marks it out from other areas in the country. The term 'problem areas' has to be understood in the context of the concept of backwardness indicated in para 4.7 above. To reiterate, the Committee has focussed attention on the need for special measures involving directional departures or changes in emphasis in the complex of programmes, policies and institutional arrangements in the various sectors of development. A few examples will illustrate what is meant by 'directional departures':-

— The national programme for agriculture production places great emphasis on the new seed water fertilizer technology which is optimal in irrigated or assured rainfall areas. However, this technology is not readily applicable in dryland areas where an alternative technology with a different mix of inputs, services and infrastructure is required.
— In desert areas the usual mix of rural activities is not possible and activities like animal husbandry have to play a much more important role than elsewhere.
— In hill areas, effective watershed management is much more important than elsewhere and activities like horticulture and forestry are as important as agricultural production.
— In tribal areas, the gap between the potential for development and the capability of the local population to utilise it is far greater than elsewhere so that special measures to provide the advancement of tribal households are necessary.

4.28 The instances given above are not meant to be comprehensive. They only illustrate what is meant by terms like 'problem areas' or 'directional departures' or 'changes in emphasis'. The specificity of technological possibilities, variations in the sectoral mix of economic activity, differences in infrastructure requirements and difficulties in the participation of local people in new economic activities will, to some extent, be found in almost any area. However, there are certain areas where these problems are of an order that requires special measures. In this sense backwardness as defined in the problem area approach is also a matter of degree.

4.29 The usefulness of the problem area approach lies not so much in any higher degree of objectivity in the manner in which the areas are identified. Its real usefulness for the purposes of planning lies in the fact that it avoids aggregating very different types of areas into one generalised category labelled 'backward'. Such aggregation can mislead and inspire attempts at uniform remedies for separate problems. In fact it is instructive that when discussing development strategy, the draft report of the Chakravarty Committee on Backward Areas despite the fact that it used an uniform index based approach had to partition the 179 identified 'backward' districts into five groups of which the last had to be described as 'an assorted group of problem areas'.

4.30 The problem area approach has one further advantage. Unlike the index based approach it is constructive in the sense that the process of defining and identifying backward areas itself suggests the nature of the remedies that have to be applied. For example, if an area is considered backward because it faces the problem of chronic drought then the main remedy suggested is drought proofing.

4.31 The difficulty with the problem area approach lies in ensuring that all problem areas are taken into account. There is no sure way of ensuring that this has been done. The approach followed by the Committee was to consult the States and the people involved in development planning at the local level in a wide variety of areas. In these consultations the constraint on development and the types of areas needing special measures could be identified. In this sense the list of problem areas reflects the considered judgment of the development administration machinery. This is all to the good since the purpose behind the whole exercise is to provide this very same machinery with guidance for planning.

4.32 A certain number of problem areas have been recognised in the special area development schemes included in the plan at present. Specifically these schemes are the Drought Prone Areas Programme (DPAP), the Desert Development Programme (DDP), the Hill Area Programme (HAP) and the Tribal Area Sub-Plan (TASP). The Committee accepts special measures over and

above the normal plan programmes. On the basis of its consultations the Committee would recommend the addition of two more categories to this list of problem areas, viz., chronically flood affected areas and coastal areas affected by salinity. The justification for adding these two categories of problem areas is dealt with below.

4.33 The problem of flood affected areas has been studied recently by the Rashtriya Barh Ayog (National Flood Commission). The report of this Commission points out that flood affected areas seem to have had a poorer pace of agricultural advance than other areas. The National Committee also feels that chronically flood affected areas face certain special problems in the field of rural development. The high water levels in the flood season make it difficult to use many of the new high-yielding short duration, dwarf varieties. What these areas need for the kharif season are long term duration long-stemmed varieties which can stay above the water level and flower after the flood season. A substantial shift towards rabi cropping may also be necessary. A programme to protect human settlements from flood damage will also be required. Hence the need for such special measures justifies the treatment of chronically flood affected areas as backward areas within the meanning attached to the concept of backwardness in para 4.7 above.

4.34 Coastal areas affected by salinity were identified as areas in need of special treatment by the National Commission of Agriculture. However, no centrally supported area development scheme is in operation for these areas though the West Bengal Government has taken up a major programme of area development in the Sundarbans. Coastal areas affected by salinity cannot utilise much of the new agricultural technology and will require special measures to develop suitable salt resistant crop varieties, to reduce or control soil and water salinity, to promote new activities like brackish water fisheries, etc. Hence in this case too the nature of the special measures required would justify their treatment as backward areas.

4.35 Thus the National Committee would recommend that the following types of problem areas be treated as backward for purposes of planning.

(i) Chronically drought prone areas.
(ii) Desert areas.
(iii) Tribal areas.
(iv) Hill areas.
(v) Chronically flood affected areas.
(vi) Coastal areas affected by salinity.

These six categories can be viewed as six types of fundamental backwardness. In this sense an area may suffer from the handicap of more than one type of fundamental backwardness.

4.36 The National Committee specifically called for suggestions from the States and has received several other suggestions for inclusion in the list of backward areas, e.g., inland areas with saline alkali soils, ravine areas, kandi areas in the foot hills of the Himalayas and areas with a concentration of scheduled castes. Many of the suggestions have been taken into account in the criteria for the identification of each of the six categories of backward areas, e.g., areas of scheduled caste concentration and kandi areas have been allowed for in the definitions proposed later for identifying tribal areas and backward hill areas. In some of the cases the Committee is of the view that the nature of the special measures required is not such that a major directional departure in development strategy is required. For instance inland areas with saline/alkaline soils will require a special programme to correct the soil chemistry. However, beyond that major changes in strategy may not be required. Hence for planning purposes such areas do not need to be treated as backward within the measure of the concept as indicated earlier in para 4.7.

4.37 The six types of fundamental backwardness identified will help to identify the areas where suitable area specific development strategies can give results. However, there is one constraint which can make this difficult. This arises from the prevalence of feudal elements in production relations. The main characteristics of feudalism is that the fruits of labour go to the people at the top and as a result, the vast mass of people at the bottom have no incentive to change. Hence directional change and area specific strategies will have no effect unless the overall fundamental defect of feudal social structure is corrected. The problem of feudal elements

affecting production is found not merely in the six types of backward areas identified above but also in many others. In fact, many areas which are covered by the six types but which nevertheless seem to be backward may well be areas suffering from feudal hangover.

4.38 Besides areas affected by feudalism, a further category which is excluded from the typology presented earlier is that of areas which suffer from the lack of administrative presence. The developmental process in rural area is very dependent on initiatives stimulated by the support systems for research, extension, credit input delivery and marketing support. There are many areas where the potential for development is not realised because these systems are poorly developed and indifferently staffed. Many instances of this can be found in areas like the north-east. The Committee recognises the gravity of this problem but for a variety of reasons has not treated administrative backwardness as a further type of backwardness. To begin with, administrative backwardness is not readily measured in any objective manner. The absence of institutions and the number of vacant posts can be quantified but the poor quality of personnel cannot be reduced to any index. Secondly, the answer to this problem lies in administrative action and not in any special area development programme. Finally, many of the areas suffering from administrative deficiencies are, in fact, the areas of fundamental backwardness listed earlier.

4.39 There is one further factor to which the National Committee would draw attention. This is the differential response of different communities to developmental stimulii. Studies done by the Institute of Economic and Social Change on Tumkur District show that villages with roughly similar national endowments and human skills have responded differently to development stimulii. Some have grown whereas others, similarly placed, have not. The studies have suggested an explanation based on a concept described as the 'community element'. This refers to the ability of a community to perceive development possibilities, throw up the necessary leadership and utilise the opportunities created by the processes of development. The variations that arise from this 'community element' are readily perceived but the concept itself is not amenable to any meaningful quantification. It is also difficult to predict in advance of the attempt that this community will respond well to some initiative and that one will no(t). However, the Committee would hazard a guess that many of the communities who may lack the initiative to respond vigorously to development possibilities will in fact be found in the areas of fundamental backwardness listed earlier, particularly in the areas of tribal concentration. Hence the concept of 'community element' does not define an additional category of backwardness but indicates a consideration which should be dealt into the development plans for the areas of fundamental backwardness.

4.40 The Committee has also considered the problem of industrial dispersal and in that context identified certain areas as being in need of special measures to promote industrialisation. These areas have been defined in terms of the level of industrial employment and the proximity to existing centres of industry. Industrial backwardness in this sense, is distinct from the types of fundamental backwardness outlined earlier. It is a matter of history and cannot be linked up straightaway with an index of local potential of human endeavour. It is in a class by itself and remedies have to be sought, not in area development schemes, but in the creation of a commercial and industrial environment in a dispersed network of growth centres.

ANNEXURE 4.1

From the Draft Report of the Chakravarty Committee on Backward Areas.

Identification and Classification of Backward Areas

1. Backwardness is a relative concept, particularly in a developing country like India. However, within the overall context of under-development, observable patterns exist and areas with different kinds and severities of backwardness can be identified. Assuming that the total elimination of backwardness in the country is a long-term process, it is still necessary to identify levels of development, the factors with which such levels

are associated and the features underlying structural backwardness. This necessity arises for formulating strategies for long term plans, immediate policy requirements and the choice of the instruments.

2. Such an identification should be based on an objective study of the geographic differences in the character and severity of backwardness. In order to get a feel of the spatial dimensions of backwardness in the country, the Committee conducted studies to describe and map the distribution of backwardness in detail and to relate the patterns of backwardness to the environmental, social and economic variables that may help explain the observed patterns.

Definitions, Assumptions and Methods

3. Given the imperfect state of regional statistics in the country, particularly for this task, there is no single measure which can effectively portray the level of development of small area units. Per capita income and unemployment are in the nature of synthetic variables measuring levels of development. But such data are not available at a fine spatial disaggregation. Further, in developing countries like India, where backwardness is in the nature of a 'collective syndrome', the backward pockets cannot all be meaningfully described by the simple two-fold criteria of unemployment and low income. Nor is it sufficient to concentrate attention on levels of per capita consumption which may be very different from levels of income generated in areas which receive large amount of remittances from out migrants. The purpose of this Committee is to provide an approach towards the formulation of plans for backward areas where backwardness refers not necessarily to poverty but to the factors which underly such poverty. These factors are complex and backwardness is a multidimensional phenomenon. Hence a multiple criteria approach is indicated for the identification of backward areas.

4. The approach to the identification of backward areas has, therefore, to be based on a set of what may be called 'partial indicators of development and under-development'. The selection of such a set of indicators is a crucial

decision. Only such indicators should be chosen which (as) would best express the relative variations in development among various areas units. However, the type and number of indicators that may be used for this purpose is ultimately circumscribed by data availability. Further the indicators chosen should cover a range of development aspects and should not seriously overlap among themselves. So far as the area unit is concerned, the District in our country seems to be the obvious choice since at this level not only sufficient data is available but also an administrative organisation for the formulation and implementation of plans. After examining the comparable data at present available at district level, the following fourteen variables were chosen for the analysis-

1. Density of population per square km of area.
2. Percentage of agricultural workers to total working force.
3. Gross value of output of foodgrains per head of rural population.
4. Gross value of output of non-foodgrains per head of rural population.
5. Gross value of output of all crops per head of rural population.
6. Percentage of total establishment using electricity to total number of establishments (manufacturing and repair).
7. Percentage of household establishments using electricity to total household establishments.
8. Percentage of non-household establishments using electricity to total non-household establishments.
9. Number of workers in registered factories per lakh of population.
10. Length of surfaced roads per 100 sq. kms of area.
11. Length of surfaced roads per lakh of population.
12. Percentage of male literates to male population.
13. Percentage of female literates to female population.
14. Percentage of total literates to total population.

5. Among the variables used, density of population is a slightly ambigous indicator. A high density may be a measure of the pressure of population and hence of backwardness. It could also reflect higher levels of development and economic activity arising out of urbanisation. The percentage of agricultural workers to total working force is an indicator of backwardness, measuring dependence on traditional occupations in the agricultural sector. Per capita gross value of output for foodgrains is an indicator of productivity while that for non-foodgrains of commercialisation. The percentage of household establishments using electricity to total household establishments may be termed as an indicator reflecting consumption and general welfare, while that of non-household establishments using electricity could be regarded as an indicator of the growth of industry and commerce. The number of workers per lakh of population in registered factories is a measure of employment opportunities in the organised manufacturing sector. Length of surfaced roads is an infra-structure indicator reflecting accessibility standards. All the three indicators relating to literacy may be regarded as social infrastructure and attitudinal indicators. The indicators selected are generally complementary rather than substitutes. Taken together, they may be considered as representing the major dimensions of the socio-economic levels of development in the country.

6. It was felt that there was need for combining the variables into a single index of regional desparities in levels of development. Three approaches were attempted, viz.,

1. The simple ranking method;
2. The indices method; and
3. Principal-component analysis.

In the case of the first two methods, density of population was not taken into account because of the ambiguity in interpretation and the remaining variables were reduced to the following six by averaging the value in the case of overlapping variables:-

1.   Percentage of agricultural workers to total working force.

2.   Gross value of output of foodgrains and non-foodgrains per head of rural population.

3.   Establishments using electricity to total establishments (Household, non-household and total).

4.   Number of workers in registered factories per lakh of population.

5.   Length of surfaced roads (per lakh of population and per 100 sq. km of area).

6.   Percentage of literacy (Male, female and total).

7. In the procedure for combining the indicators, equal weightage was adopted in the ranking and indices method exercises.

The Simple Ranking Method

8. The following procedure was adopted in this method:-

(a)   Each district was ranked as per the various indicators.

(b)   The individual ranks were added to get a total rank for the district.

(c)   Taking the median value (955) as the cut-off point, all those districts which had a value below the median value were classified as backward.

The frequency distribution of districts by total ranks is as follows:-

Categories (showing) ranges of total ranks	Number of districts
Less than 400	8
401 to 650	59
651 to 955	97
956 to 1,250	65
1,251 to 1,500	74
1,501 +	23

Thus, by this method, 164 districts get classified as backward areas.

The Indices Method

9. An index of development of each district was computed on the basis of the above six indicators taking the national average position as 100. The index of development of the district was then obtained by taking the arithmetic average for all indicators. The districts with indices below 100 are treated as backward in this case. The results of this exercise is as indicated below:-

Value of indices	Number of districts
Less than 50	81
61 to 80	66
81 to 100	39
101 to 120	45
121 +	75

Thus, by this method, 206 districts get classified as backward.

Principal Component Analysis

10. In the simple ranking method and the indices method, an equal weighting technique was followed which is without underlying mathematical logic. The use of more sophisticated statistical techniques can meet the problem of assigning weights to each indicator. The principal component analysis was, therefore, used as a supplement to the other simple methods. In this method, all the fourteen variables were used. The principal component analysis starts with a matrix of correlation co-efficients measuring the degree of co-relation between the indicators. Operations upon the basic data matrix then extract the first factor, which accounts for the greatest proportion of the inter-correlations, leaving portions not accounted for in a residual matrix. The operations are repeated upon successive residual matrices and further independent factors are extracted, not

all of whom need be significant.

11. The density of population shows significant positive correlation with indicators signifying power consumption, urbanisation, literacy and industrialisation and negative correlation with agricultural working force and length of surfaced roads per lakh of population. This may be taken to justify the interpretation of density as an 'indicator' associated with development. As expected, the percentage of agricultural workers to total working force shows significant negative correlation with all the indicators relating to urbanisation. Per capita gross value of non-foodgrains output on the other hand shows significant correlation with the variables reflecting industrialisation.

All the four variables indicating industrialisation (percentage of establishments using electricity for household, non-household and all establishments, and workers in registered factories per lakh of population) move together, suggesting that they are overlapping. Similarly, the variables on literacy (male, female and total) also reveal an overlapping nature. The length of surfaced roads shows weak correlation with other variables. From the analysis of the correlation matrix, seven variables show significant inter-correlations, viz., density of population, percentage of agricultural workers to total working force, gross value of output of foodgrains per head of rural population, gross value of output of non-foodgrains per head of rural population, percentage of establishments using electricity to total establishments, workers in registered factories per lakh of population and percentage of total literates to total population.

12. The correlation matrix was then analysed to identify the major factors (if any) which summarises the structure of information. It was found that 83.02 per cent of the total variation of the fourteen variables can be described by three basic components. Table I gives the composition of these three components:-

TABLE I

Sr. No. (1)	Variable (2)	Component I Backwardness (3)	Component II Development (4)	Component III Industrialisation (5)
1.	Density of population	(-) .41007	(-) .025562	(-) .25529
2.	Agricultural workers to total working forces	.73840	.11679	.11891
3.	Gross value of output of foodgrains per head of rural population	.01993	.65595	(-) .04713
4.	Gross value of output of non-foodgrains per head of rural population	(-) .26436	.68888	.14062
5.	Percentage of establishments using electricity to total establishments	(-) .72771	.38032	.37675
6.	Percentage of HH establishments using electricity to total HH establishments	(-) .41438	.35499	.43430
7.	Percentage of non-HH establishments using electricity to total non-HH establishments	(-) .48953	.38336	.50080
8.	Workers in registered factories per lakh of population	(-) .63850	(-) .04963	.08327
9.	Length of surfaced roads per lakh of population	(-) .18506	.17188	(-) .00491
10.	Length of surfaced roads per lakh of population	.00554	.06925	(-) .08660
11.	Percentage of male literates to male population	(-) .85709	(-) .28260	(-) .23920
12.	Percentage of female literates to female population	(-) .90182	(-) .25175	(-) .24203
13.	Percentage of total literates to total population	(-) .90750	(-) .26671	(-) .24752
14.	Gross value of output of all crops (19 crops) per head of rural population	(-) .13670	.89279	(-) .40968
	Variance %	45.04	24.21	13.77

13. Component I, which accounts for 45 per cent of the inter-correlations of the indicators, can be obviously interpreted as a component of backwardness. Personal of column 3 of the table I is fairly instructive. It can be interpreted as follows:

The use of a mass of information on levels of development (14 variables on 326 districts) shows that 455 per cent of the independent information used tends to portary the structural backwardness in space. This aspect is strongly underlined by the negative loadings of development allocations on the first component.

The heaviest loadings which tend to pull a district down the scale of backwardness are the low degree of commercialisation, power consumption, industrialisation, literacy and density of population all pointing to a structure of backwardness.

14. In the case of Component II, the high positive loadings in respect of rural output indicators and the negative loadings in respect of density of population, literacy and number of workers in factories, are significant features. From this, the second component may be labelled

as a component of rural development. In the case of Component III, the positive loadings are in respect of the variables relating to industrialisation and, therefore, this component may be called the component of industrialisation.

From the point of view of the present study, Component I is significant and Component II and III have been used as aid to refinement of interpretation.

15. In order to note the performance of each district on Component I, the score for each district was calculated. An examination of the factor scores reveals that there are distinct break-point at values - 1.4, 0.10 and 1.19, suggesting a grouping into four categories as follows:-

Category (1)	Factor-score groupings (2)	Number of districts (3)
I	-3.3 to -1.5	29
II	-1.4 to +0.09	11
III	+0.10 to 1.18	161
IV	1.19 to 1.65	20

Categories I and II indicate the relatively developed districts while Categories III and IV represent the relatively backward districts. Thus, according to this method, 181 districts in the country have been identified as backward.

Result of Three Methods

16. A comparative picture of the results obtained by the three methods is given below:-

Method (1)	Cut-off point for backwardness (2)	Number of districts (3)
1. Simple ranking method	Medium value of total ranks-955	164
2. The indices method	Below 100	206
3. Principal component method	Factor-score above 0.10	181

A further analysis of the results of the three methods reveals that 160* districts are common to all the three methods. For the districts in Manipur (5 districts), Sikkim (4 districts), Arunachal Pradesh (5 districts), Andaman and Nicobar Islands, Lakshadweep, Dadra and Nagar Haveli, Mizoram and Ladakh data on the chosen indicators were inadequate. From the statistical material available, coupled with a *prior* understanding of these areas, these also have been at present taken into account in the category of backward districts. If this assumption is accepted, the number of backward districts comes to 179. These common districts have been taken as constituting the *"hard core of backward areas"* in the country.

17. The number of districts covered by at least one special programme like the DPAP, Hill Area Programme, Tribal Programme, Investment Subsidy Scheme, and concessional finance, is 298. It was found that only 172 districts out of

179 in the hard core backward area were covered by one or more programmes of the type mentioned above. There are, thus, 7 backward districts in the hard core which are still not covered by any of the special programmes. These districts are Hazaribagh (Bihar), Bilaspur (Himachal Pradesh), Satna (Madhya Pradesh), Bharatpur, Sawai Madhopur and Bundi (Rajasthan) and Gorakhpur (Uttar Pradesh). The intention of determining backward districts was mainly analytical. The idea was to construct a framework of measuring the status of development taking into account socio-economic and structural aspects and to provide a tool for diagnosis and planning.

Distributional Pattern of Backward Area

18. The distribution of the 179 identified backward districts reveals a distinctive pattern. It reveals a vast contiguous territory of backwardness in the Central Part of India, extending from the Northern (Telengana) district of Andhra

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* In the above analysis, Meghalaya (2 districts), Nagaland (3 districts), and Tripura (3 districts), were taken as only 3 *entries*, since district-wise data was not available, However, while computing the total number of common districts, the actual number of districts are given.

Pradesh through a large part of Madhya Pradesh, Orissa, some Eastern and Northern districts of West Bengal, most of Bihar, Eastern Uttar Pradesh and extending partly into some Central and Western Uttar Pradesh districts. The few advanced districts lying in this belt stand out as 'islands'. The central belt of backwardness is interrupted by the relatively developed districts of Western Uttar Pradesh, Haryana and Punjab to the South and East of Delhi. A second stretch of backward areas runs as a contiguous belt in the Himalayan foot hill zone including the districts of Jammu and Kashmir, Himachal Pradesh and the hill districts of Utter Pradesh. A third belt, which is not so continuous, stretches in the west through Rajasthan and Gujarat and is linked with the Western Madhya Pradesh districts of Morena and Shivpuri extending into the central belt. Outside this whole area, the only other extensive area of backwardness is the one extending through the States and Union Territories in the North East Region. Somewhat detached from all these backward area belts are the few scattered pockets in Cuddapah district (Andhra Pradesh), Dharamapuri (Tamil Nadu), Bhir (Maharashtra), the Dangs (Gujarat) and the Union Territories of Dadra and Nagar Haveli, Lakshadweep and Andaman and Nicobar Islands. Thus the distribution of backward area in the country may be described in terms of four extensive continuous belts and seven small pockets outside these belts. The distribution is as under:-

Area	Constituent States and number of districts	
1. Central Belt	Andhra Pradesh	8
	Maharashtra	1
	Orissa	10
	Madhya Pradesh	31
	West Bengal	7
	Bihar	14
	Uttar Pradesh (Eastern, Central and Western)	31
	Total	102
2. Himalayan Foot Hill Belt	Jammu and Kashmir	7
	Himachal Pradesh	6
	Hill district of UP	6
	Sikkim	4
	Total	23
3. Rajasthan-Gujarat Belt	Rajasthan	20
	Gujarat	2
	Total	22
4. North-Eastern Region	Assam	6
	Meghlaya	2
	Nagaland	3
	Arunachal Pradesh	5
	Tripura	3
	Manipur	5
	Mizoram	1
	Total	25
5. Isolated Backward Pockets	Gujarat	1
	Andhra Pradesh	1
	Maharashtra	1
	Tamil Nadu	1
	Dadra & Nagar Haveli	1
	Lakshadweep	1
	Andaman & Nicobar Islands	1
	Total	7

PROFESSOR DANDEKAR ON INDIAN AGRICULTURE

S. H. Deshpande

For a few years before his demise on July 30, 1995, Prof. Dandekar had been working on a three-volume study of the Indian economy based on his own writings. That the whole gamut of the economic problems of India over the entire post-Independence period could be encompassed mainly through one's own writings is a tribute to Dandekar's comprehensive intellect which left almost no area untouched. The volume under review is the first in the series and deals with developments in agriculture. The second on *Population, Poverty and Employment*, has just been brought out [1996]. The third, unfortunately, may not see the light of the day since Dandekar could not complete giving final touches to the material before he passed away. One hopes that the Indian School of Political Economy puts together a selection of his articles on *Production, Trade and Finance* (as Dandekar himself had named it).

The present volume contains six chapters: (1) Transforming Traditional Agriculture, (2) Agricultural Administration, Research and Education, (3) Food Administration, (4) Agricultural Marketing and Prices, (5) Agricultural Credit, and (6) Future Agricultural Policy. The stress is on 'institutions rather than on production and technology' as the author himself says. As he further says, '.... this is not a mere collection of selected writings. Past writings only provide the basis. They have been very considerably edited and updated but not changed with hindsight, pieced together, gaps filled in with additional material, references, etc., to make them into a coherent volume'. However, in the process of 'piecing together' repetitions have occurred in several places with whole passages reappearing.

The reader misses Dandekar's writings on the cattle economy, agricultural insurance, distribution of irrigation water, etc.. Absent, also, are his insights into Maharashtrian village life contained in the two excellent books in Marathi which he wrote with M.B. Jagtap as a joint author [Dandekar and Jagtap, 1957; Dandekar and Jagtap, 1963].

The book partly portrays the developments of policies and partly offers critical comments on them. One cannot escape the impression that in many cases long-winded and mostly pointless histories have been recounted in tedious detail. Obviously Dandekar, struggling with health problems in the last years of his life, does not seem to have had sufficient quiet of mind to give a satisfactory shape to the voluminous material at hand. Yet it must be said that his essential thrusts in the main areas are all here.

In this review we shall ignore those parts of the book where history, for its own sake, has been delineated and concentrate on Dandekar's own criticisms of policies.

Dandekar has an overall conception about the nature of the Indian agricultural economy and his comments on most problems and his policy conclusions are consistent with this conception. According to it, the chief cause of the agricultural *malaise* is overpopulation which has resulted in making a large number of farms small and non-viable and giving rise, also, to a large army of the unemployed. Both the small farmers and the agricultural labourers suffer from unemployment and poverty. He further believed that the poverty of the non-viable farmer impoverished the productive capacity of land and other resources. In other words, poverty of the farmer made agriculture poorer. And the process went on in a vicious circle, each one making the other poorer.

Thus Dandekar's central worry is about the basic structural problem of agriculture. In so far as the remedy is concerned, Dandekar thought that easier credit, better prices, subsidised inputs, land reforms, anti-poverty schemes based on self-employment, etc., in short, all the popular measures propounded and practised throughout the period of planned development, were really of no avail. The only solution was to remove the excess population from land so as to ease the burden on agriculture and enable structural improvements to take place. The precise way in

which to do this he outlined in his *Poverty in India*
(written with N. Rath as the joint author in 1971)
whose subject, of course, falls beyond the pur-
view of this volume. Naturally, its theme gets only
incidental mention at some places in the book
under review. But while reading this book it
would be useful for the reader to keep in mind
Dandekar's prescription for poverty removal
contained in *Poverty* [Dandekar and Rath, 1971].
That consisted of guaranteed employment offered
by the State on capital construction works which
would improve the structure as well as the pro-
ductivity of land at the same time as it eliminated
poverty. Unless this perspective is kept in mind
there is a danger that in his criticisms of traditional
governmental policies he might appear unduly
negative.

Traditional Agriculture

Dandekar's conception of India's agriculture
comes out forcefully in his critique of Theodore
Schultz's *Transforming Traditional Agriculture*
and his reply to comments on his critique by S.N.
Mishra and Tara Shukla (Pp. 96-126).

Schultz's picture of traditional, (i.e., backward)
agriculture is that of stagnation which he
describes as 'stationary equilibrium'. He devel-
ops his model as follows: One basic assumption
is that farmers (even in traditional agriculture) are
efficient allocators of resources. The other basic
assumption is the usual *ceteris paribus*, especially
implying that there is no technological progress.
Given these, it is deduced that the farmers, over
a sufficiently long period of time would have
exhausted all the productive possibilities of their
resources — they would have reached an equi-
librium. All the needed capital will have been
accumulated and further investment will not be
undertaken because it will not pay. Savings will
be used only for maintaining existing capital and
thus the capital stock will remain constant. Since
the stock of capital is constant, output will be
constant and with output constant the population
will not grow. All the resources will have been
fully employed, i.e., there will be no unemploy-
ment, disguised or open. This is the stationary
equilibrium with 'zero net saving and
investment'.

In such a situation the farmer would be 'efficient
but poor'. One has to notice, however, that
Schultz's 'poverty' is different from what we are
accustomed to understand by that word. For us it
means 'living below subsistence'. In Schultz's
scheme no one slides below subsistence. In other
words 'poverty' for Schultz is living at the sub-
sistence level.

This picture of backward agriculture where
there is no unemployment and no poverty (in our
sense) looks to Dandekar as a complete antithesis
of what he (and almost everyone else) believed to
be backwardness. He does not quarrel with the
efficiency hypothesis but feels that the central
weakness of Schultz's model is the assumption of
static population. He cannot understand why
Schultz should draw this inference in the face of
all evidence to the contrary.

Dandekar proceeds beyond the point at which
Schultz leaves off. Even after reaching the sta-
tionary equilibrium, he points out, the population
will continue to grow and this growth will
transform the scene from stagnancy to something
much worse. Dandekar explains this as follows:
Assuming that population growth continues with
output constant, per capita consumption will fall.
In order to stave off a fall in consumption—which
is already at the subsistence level — savings used
for maintenance of capital will be diverted to
consumption, i.e., capital will begin to be con-
sumed. Thus the capital will not remain intact; it
will shrink in size, output will fall, there will be
a further fall in consumption and a further erosion
of capital. Thus Dandekar comes to the conclu-
sion that traditional agriculture is not static; it is
in a process of 'continuous deterioration'.

Dandekar made an appeal to facts:

> That dissaving and disinvestment occur
> progressively is discernible to any one who
> is familiar with field conditions at first hand
> and innumerable instances may be cited. One
> merely has to notice the state of repairs in
> which, in a majority of cases, land, equip-
> ment, houses, livestock and, finally, people's
> health lie. Repairs are not attended to, not
> because investment in repairs does not pay or
> because knowledge and skills are lacking, but
> because no surplus over subsistence is

available for investment. So, fences, bunds, sources and channels of irrigation are not mended; implements cattle-sheds and houses are not repaired; cattle are famished and let into one another's fields for grazing; and men are undernourished to a point when often good seed is eaten (p. 107).

Thus Dandekar brings out in all its starkness the nature of traditional agriculture as he sees it.

Taking the Debate Further

This is where the debate rested. Years later I tried to find out why the conclusions of the two economists differed.

It became clear to me that there are, in addition to what I have called above the 'basic' assumptions, also certain subsidiary assumptions implicit in Schultz's analysis which provide a basis for his peculiar conclusions. In the first place he assumed capitalist farming, i.e., farming with wage labour. Secondly he assumed a proletarian (propertyless) labouring class. The third assumption is the iron law of wages. It is easy to see that under these assumptions if the population grows its burden will largely fall on the labouring families. The rise in the number of workers will result in fall in wages, consequent starvation and higher mortality. Thus population does not grow except for a brief period; the long-run tendency for population would be to remain static. The increased population could have survived a little longer had the worker any assets that he could disinvest. But he has no assets because he is propertyless! The entire capital of the community is in the possession of the capitalists who constitute a small minority and they, therefore, largely escape the adverse consequences of population growth. Thus with a spurt in population the community's capital, by and large, stays intact. There is no 'poverty' in this model except for a short while because as a long-run tendency wages will rule at the subsistence level. Nor is there any unemployment since the market mechanism driven by the maximising capitalist farmer — remember the 'efficiency' hypothesis — will take care of variations in labour force through changes in wages.

It is only if these assumptions are added to the explicit assumptions Schultz made, that his theory can stand on its own legs.

One may be tempted to ask a further question. Does not population grow within the capitalist families and thus, after a point, start eating into its capital? Of course, only a small part of the general population growth will occur in the capitalist families; but this means that the evil day is only postponed. So one more assumption seems to be necessary — that the capitalist farm is inherited by only one successor. In other words, if we accept primogeniture as the prevailing inheritance system Schultz's theory acquires complete validity.

The contrast between Schultz's and Dandekar's models should be plain once we recognise that Dandekar has in mind the more realistic assumption of peasant farming. In a community made up of peasant proprietors (family farmers) property is widely distributed, there is no wage labour, no iron law of wages to keep wages at subsistence and so you have a widespread picture of unemployment and poverty which in turn eats into the productive capacity of agricultural assets.

I drew two conclusions from this exercise. One, at the basis of Schultz's theorisation is the Ricardian framework and at the basis of the latter are the conditions of British agriculture in the early nineteenth century — conditions which included the law of primogeniture. Schultz's error lay in transplanting this early model of agricultural capitalism to underdeveloped countries of the mid-twentieth century. The other conclusion pertains to socio-psychology of intellectuals: there are occasions when an inherited theory can blind them to reality.

Turning to the present context I think my analysis, by tracking down Schultz's error to its source, buttressed Dandekar's model.[1] Let us now turn to the main theme.

Two Sectors

Dandekar is, of course, aware that the burden of population is not evenly spread. Therefore, he conceives of two sectors, one which produces a surplus above subsistence and the other which does not. His remarks on the surplus-producing

sector invite comment.

Dandekar says that the surplus-producing sector 'is not evidently under pressure of population and I think the nature of traditional agriculture here comes close to its concept as put forward by professor Schultz' (p. 108). Why Dandekar should say this is not clear because according to his own logic sometime or the other it should meet the same fate as the non-surplus producing sector. However, Dandekar seems to have had second thoughts on this and admitted later (in his reply to S.N. Mishra) that even in this sector the population pressure will grow and deterioration will start at the 'lower margin' (p. 114).

According to Schultz's scheme there is no net investment in the surplus sector either and Dandekar agrees with this. '.... in this sector in spite of saving potential, little net investment takes place because any further additions to the stock of capital of the traditional kind are not worth making and supplies of improved inputs are not readily available'. Thus far his argument follows the Schultzian line. But further on he says, 'Does it then mean that in this sector the stock of capital is optimum in relation to the size of the land? Not quite. One might find that this sector is in fact understocked...' (p. 109). Why? Because '(t)he limiting factor here is labour' (p. 109).

Dandekar gives the following reasons for shortage of labour in this sector. The labour now has to be hired and it will have to be drawn from the non-surplus sector. This labour is unproductive for two reasons. 'One is the basic difference between the family labour of the farmer and hired labour' (p. 109). What Dandekar probably means is the lower motivation level of the hired labourer who works on somebody else's farm rather than on his own. 'Second, often the physical and mental qualities of the labour that can be hired are such that its productivity is necessarily below subsistence' (p. 109). The reason is 'malnutrition and hunger' over a long period. 'In short, it does not pay to employ this labourer for a wage' (p. 109) which has to be at least a subsistence wage. 'Hence it is not employed, unless it becomes absolutely necessary' (p. 109).

Then there are other factors which put a brake on the expansion of the surplus sector. 'These too

are consequences of population pressure, though not inside the sector but outside of it. In the midst of poverty and hunger, it is always difficult to protect visible prosperity. A good standing crop is frequently in danger of being trespassed by hungry men and hungry cattle, and a good prosperous farmer often finds himself surrounded by latent hostility. Therefore, in his farm operations, even a farmer with means and ability is unwilling to enter into a commitment which he, with his own labour and the labour of the members of his family, cannot meet' (p. 110).

What then happens to the surplus in this sector which does not go into creation of capital? It flows into the following channels: (1) Ostentatious and wasteful consumption. (2) Education of sons for their 'eventual move out of agriculture'. In addition, it flows into other channels also which are important from the point of view of intersectoral relations They are: (3) Buying additional land for renting out. (4) Money-lending for consumption purposes at exorbitant interest rates. (5) Trading and shop-keeping. The last three activities are 'exploitative'. The result is: 'Thus the two sectors exist side by side not in a mutually complementary relationship but a relationship based on exploitation, callous disregard, resentment and latent hostility' (p. 111).

A number of questions arise.

Let us agree, for a moment, that labour is the limiting factor which means that the farmer has to work with a given supply of labour (provided by the family). Dandekar believes that the amount of land is in excess of what the family labour can manage and therefore although land can absorb more capital, investment is not undertaken because additional labour is not available to work with the capital. But the question is: Why should a situation of excess land in relation to labour arise? Is not amount of land, too, variable? Of course for technical and legal reasons one may not get the exact quantity of land that one may need. But that would mean that sometimes the holding may be too small in relation to available family labour just as it may sometimes be too large.

But more basic objections arise in regard to the postulation of 'labour as the limiting factor'. It

must be remembered that the blanket term 'productivity' conceals three components: (1) Motivation, which Dandekar has mentioned. (2) Physical and mental energy which also Dandekar has mentioned. But there is a third component—the resources and implements with which the worker works. Now it can be seen that the labourer in the non-surplus sector is 'less productive' also because he works with degraded land where improvements have vanished because of disinvestment and ramshackle equipment which has not been properly maintained. Therefore the existing 'productivity' of the worker from the non-surplus sector must be assumed to improve when he moves to the surplus sector where land and capital are in a better condition. It must be assumed to improve also because the 'subsistence wage' that has to be offered to him will at least partly make up his physical and mental deficiency. The point about motivation holds but, once again, it is no big obstruction to expansion of an enterprise.

Moreover just as Dandekar thinks of the 'lower margin' of the surplus sector he could have thought of the 'upper margin' of the non-surplus sector from which able-bodied and physically fit workers can be recruited.

On this point also Dandekar relents a bit as is apparent from his reply to Mishra. He cannot ignore the existence of an agricultural labour market. What he had said earlier 'could be misunderstood to say that labour did not at all move and that there was no hired employment in traditional agriculture. This is of course wrong. Labour certainly is hired but not to the full extent required to equalise its marginal productivity in all farms. This is what I wanted to say' (p. 120). That is well taken.

In a blanket fashion Dandekar condemns renting, money-lending and shop-keeping as 'exploitative' and 'anti-social'. Clearly here he is reproducing leftist shibboleths without much thought. If he were to consult relevant literature he would have found that such statements are at the most half-truths. The fact of the matter is that Dandekar can sometimes bid good-bye to rigorous economic analysis.

Policy Implications

One predominant policy implication that flows from Schultz's analysis of traditional agriculture is that less costly factors of production must be made available to the agriculturists. For, according to him, no net investment is undertaken because traditional factors have been used to their capacity. (He puts it in a round-about way saying the traditional factors are 'costly'.) Therefore investment costs must be reduced. This can only happen when improved technology appears on the scene. Thus his prescription, in brief, is 'technological improvement'. This calls for investment in research, education and training.

Dandekar would have no objection to this prescription. But he has also other recommendations to make flowing from his analysis summarised earlier. For the surplus sector he recommends regulation of the harmful and 'anti-social' activities of renting, money lending and trading so that savings would flow into more desirable channels (p. 113). For shortage of labour he sees the remedy in mechanization (p. 113). Since I have already questioned the premises from which these recommendations flow, it is unnecessary for me to criticise them separately.

For the non-viable sector his recommendation centres around what he considers the most disastrous consequence of deteriorating agriculture — the impoverished, undernourished, physically and mentally crippled man behind the plough. And here comes his pet theme which he elaborated later — employment on capital construction. '.... a part (of labour) will have to be withdrawn from current cultivation and employed on works which will directly create capital mostly embedded in land.... (However, this will require) an effort of organisation. ... I am not sure that all this can be done without disturbing the family farm organisation in this sector' (Pp. 113-114).

Therefore we must now turn to Dandekar's ideas about reorganisation of agriculture.

Co-operative Farming and Related Matters

As Dandekar shows, the Draft First Five Year Plan's idea of 'Co-operative Village Management' was ambiguous and confusing. However,

gradually a certain amount of clarity seems to have crept in into the Planning Commission's thinking. The Draft outline hinted at pooling of labour and joint cultivation but the final version of the Plan allowed flexibility of approach. In the Second Plan an important distinction was made between 'unit of management' and 'unit of operation' which Dandekar unfairly dismisses as 'semantics' (p. 57). The Second Plan paragraph quoted by Dandekar says, 'Even where a large area, or the village as a whole is the unit of management, for many years, the common unit of operation will be the present (peasant?) holding. If the village is the unit of planning, there could be co-operation in many operations, such as the use of improved seed, common buying and selling, in soil conservation, in the use of water, in the construction of local works, and increasingly, in the principal farm operations' (p. 87). True, the long-term perspective of joint production is not given up but 'for many years' private farming is supposed to continue and co-operation would be resorted to in obtaining services needed for agricultural production. This might not be called 'co-operative farming' or even 'co-operative village management' but there is no doubt that the emphasis on joint cultivation (with pooled labour) has been given up.

However, one has to agree that the Planning Commission's style of writing was certainly not a model of clarity and with things remaining vague in respect of the meaning of a vital governmental policy affecting agriculture Dandekar's exasperation — 'one wonders whether they knew what they were talking about' (p. 64) — is understandable.

The Draft outline of the First Plan suggested co-operative farming for small farmers. What that meant may have remained unclear but Dandekar seems to have added to the confusion by his own misconception of what it meant. See what he says:

> The main advantage of individual peasant holdings in conditions of overpopulation is that they maximise employment to the extent it maximises output. Once the individual holdings are put in the form of a co-operative production unit, this advantage is lost because a co-operative production unit is

normally expected to maximise its profits, not output, and therefore cannot employ labour beyond the point when the profits are maximised (Pp. 61-62).

It is clear from the above that Dandekar is using here 'wage-labour', 'marginal product', 'profit maximisation', etc., which are concepts relevant to a *capitalistic mode of production* which a state farm alone can use and not a co-operative farm. In a state farm, though the ownership and management is of the state, the farm is run with hired (wage) labour, i.e., the *method* is capitalistic and the rules of profit maximisation hold good in its case. The Soviet State Farms were run on this principle. On the other hand, the co-operative joint or collective farm, especially of the poor farmers, will not pay a market wage simply because it cannot. The usual method of payment in such enterprises is *sharing* of the total output in proportion to the 'labour-days' contributed by each worker and this was the universal practice in the Soviet collective farms. In practice this proved a cumbersome and inefficient method but since there was no other it had to be resorted to.

Dandekar further says:

> As a result, even the family workers of the members of a co-operative cannot all be employed if what they add to the output is short of the wages which they must be paid. In fact the co-operative farm brings to surface the unemployment which otherwise appears in the disguised form of self employment in family farms (p. 62).

It is not possible for a co-operative farm to employ only so much labour and not more because the labour is member-labour and as members they have an equal right to demand work. Nobody can be laid off. In such situations the farm manager will have to either *divide* the work so that each one gets a fair share of it or *create* work — either real or fictitious. (Soviet collective farms were constantly accused of 'padding'). In other words the farm manager will be under obligation to maximise *employment* and not profits.

Of course it is possible that farm work may not

be amenable to division in all cases and there may be some surplus time available with some of the workers. That is, even without a wage system and application of the marginal calculus some disguised unemployment might come into the open but it will not be as large as would result from the application of the marginal-cost- marginal-return-equality principle.

Whatever the size of the labour-surplus (unemployed time), Dandekar feels that the greatest advantage of the co-operative farm is that it can utilise it in works of capital construction. To quote:

> It is this possibility which enables the co-operative production units to create additional employment.... The superiority of the co-operative production units lies in this that they alone, as distinct from individual family holdings, can undertake certain categories of capital works. The optimum size of a co-operative farm must therefore be decided, not by the exclusive considerations and techniques of current production, but also, and perhaps mainly, by the requirements of discovering, planning and executing capital works. Thus conceived, the optimum size of a co-operative farm will be sizeable agricultural regions (p. 63).

Given the possibility of utilisation of surplus labour on capital construction works Dandekar is right in suggesting that the optimum size of the farm should be decided in the light of not merely the requirements of efficiency of current production but also of future production. However, this can only be an ideal and the management of sizeable agricultural regions would be a daunting task for a co-operative. Smaller co-operative farms may not be able to exploit *all* the possibilities of further production but they may exploit *some* and that would still be a gain. 'Better' need not be the enemy of the 'good'.

However, the more important point in this connection is: the use of surplus labour, means that members put in more work than they did on their private farms — but without any extra remuneration. In terms of the method of payment on the co-operative farm the value of the

labour-day depreciates because (until the new investments fructify) the total output of the farm is the same — only the amount of work has increased. Whether in such conditions the members would work more with any degree of enthusiasm is questionable. Moreover, the probability that with the depreciation in the value of the labour-day the members of a co-operative may try to seek outside work must also be taken into account.[2]

Dandekar's Own Co-operative Farming

Forget what the Planning Commission meant by Co-operative Village Management and Co-operative Farming. Dandekar has his own ideas on this subject which he elaborated in his address to the Annual Conference of the Indian Society of Agricultural Economics in 1966, included in chapter 2 of this book, on 'Agricultural Administration, Research and Education'.

Here Dandekar takes up his theme of 'sizeable agricultural regions' as units of planning and recommends, first, physical reorganisation for 'improving the use, promoting conservation, and facilitating development of the soil and water resources....' (p. 194). To achieve this 'area planning.... must cut across political and administrative boundaries between states, between districts, between development blocks, between villages, and finally between individual proprietary rights' (p. 194). This done, an agricultural engineer, in consultation with an agronomist, makes a plan for all kinds of improvements such as levelling, bunding, minor irrigation channels, paths, cart-tracks, etc., and decides upon a cropping pattern and its rotation. For planning purposes private rights are ignored and the tract of land is looked upon as a single farm.

> Then must begin a process of education and persuasion. Its purpose is to secure the consent of the persons concerned to the proposed plan and to a scheme of redistribution of the land among themselves. The principle of redistribution should be that everybody should get back as far as possible an area approximately equal to or equal in value to

his original holding within the block and that any marginal losses should be fully compensated by those who gain thereby (p. 197).

Once land is redistributed cultivation will be private. Joint decisions will be taken only in regard to cropping programme, watch and ward, pesticides use, maintenance and repair of farm assets, etc. Though Dandekar does not mention this, purchase of inputs and marketing and, perhaps, even credit would be arranged on a common basis.

Let us note the salient features of this scheme. Land is the centre of attention here, its efficient and productive use being the overarching goal. And once this is accepted, land and its efficiency requirements take precedence and 'sizeable agricultural regions' crossing even state boundaries begin to loom somewhat threateningly over men and women.

However, we need not take Dandekar literally and return home to the village or even a watershed within a village. What may be attempted on a large scale may also be attempted on a small scale, although at the sacrifice of some possible advantages.

And here, whatever the size of the area chosen, the crucial question is the adjustment of individual land-rights which no scheme of area planning can escape facing. One visualises a variety of snags. One is the exchanges of land among owners. This calls for valuation somewhat similar to that involved in consolidation procedures but with an important difference. Existing productivity and current market values can be taken as guides for transfers of land prior to consolidation of holdings. In the case under consideration future values of different parts of the area as differentially affected by the proposed improvements will have to guide the process of transfers. Secondly, not merely the landowners but also the cultivators with vested and legally protected rights will have to agree to the readjustments. May be revision of terms of tenancy agreements will also be involved. Of course, that is a matter between the owner and the tenant but differences on this issue would certainly arise before a landowner agrees to the new dispensation. The new scheme will certainly bring in an

element of orderliness in the otherwise chaotic layout with lands of irregular shapes and sizes and remove the earlier fragmentation. However, if assignment of various parts of land to various fields of crop rotation is intended, a new 'rational' kind of fragmentation will be called for with the participants asking for a strip in each field of crop rotation.

Given the difficulties of operating this complicated mechanism Dandekar is aware that it cannot have a purely voluntary basis. Therefore he recommends for management purposes a 'democratic statutory authority.' The idea probably is that if a majority of owners or owners of the major portion of the area agree on the new pattern the minority will have to fall in line.

And finally, let it be observed that although cultivation is free and private, this freedom is narrowly circumscribed. The farmer is 'cribbed, cabined and confined' and made to execute decisions extraneously taken. He would do so, but unwillingly, especially when an element of compulsion is imbedded in the plan. This is not to suggest that the idea is chimerical; it has been operated successfully in many indigenous *phads* for several centuries. So it may work in some cases. However, its universal adoption as a solution to the problem of agriculture is doubtful.

Dandekar has described his address as 'dated'. Obviously he must have had second thoughts. Their direction will be evident from the position which he has taken on general policy matters in the last chapter of the book which shall be the subject of my comment a little later.

Administration, Research and Education

For administration of agricultural programmes, research and education, Dandekar's recipe is decentralisation. 'It is time that administration for agricultural development in India moved to the state capitals and further down to the agricultural universities. It is time that the role of central ministries, institutions and agencies is reduced to a minimum; to function as a clearing house of information and providing administrative support to mutual consultation between state governments and agricultural universities. The emphasis must shift away from management to agricultural

research and education of the farmer rather than training of extension officers' (Pp. 180-181).

In regard to agricultural production programmes, Dandekar's grouse is about national targets being laid down from above, getting them broken down state-wise, district-wise, block-wise, village-wise and finally farmer-wise and expecting the millions of farmers to acquiesce in them and produce. 'One might want to dismiss these phrases as part of that hocus-pocus which somehow seems so necessary to make a five year plan stand together. But, it is worse than that; these expectations and hopes were genuine and sincere. They are characteristic of our long standing attitudes towards farmers and rural people generally and of our assessment of their intelligence. We think they are children. It is time we realised that they are adults' (p. 183). And they will behave as adults and make their own choices in spite of and in disregard of what the national target-setting officers demand of them. In essence, through its planning procedures the government tries to regulate and control activities which lie beyond its control and therefore the targets lose their meaning and are never reached. His advice is, therefore, that planning should remain confined to activities over which the government can exercise control and influence the farmer's environment in the preferred direction so that he makes his own choices consistent with national policies. An attempt to estimate the outcome of these choices should certainly be made since it would be necessary in all planning; however, forecasts of this type should not be confused with statistical targets of production of each crop. '.... there are many matters on which the government and other public authorities can make decisions which affect agricultural production' (p. 185): major irrigation, imports and domestic production of fertilisers, breeding of high-yielding varieties, development of more efficient farming practices, educating the farmers about them through extension services, provision of credit, regulation of relative prices, etc. For the rest, leave the farmer to respond in his own fashion to changes in the physical and economic environment. And so 'there can be no plan targets in these fields (i.e. those connected with production) and no schemes and programmes to

achieve them' (p. 186).

Only three things could be done with the agriculturist: (i) to educate and improve the farmer as farmer; (ii) to reorganise the production apparatus in agriculture so as to enable the farmer to take better care of his land and water resources; and (iii) to create appropriate institutions in order to improve decision-making in agriculture (p. 187).

Dandekar has valuable things to say about education. Cultivate in the farmer the scientific outlook, he argues. This consists in removing the attitude of 'awe' towards Nature ingrained in our rural society and familiarising him with the fact that it is governed by laws which can be understood and put to human use, to wean him away from the attitude of sacredness to traditional 'authoritarian' knowledge and lead him to appreciate the validity of the experimental method and to make him conscious of the economic aspect of life so that he is able to make a distinction 'between his household and his farm, between his mother and his cow' (p. 190). Sadly, this is not the main function performed by our extension services.

For reorganisation of the production apparatus, Dandekar has proposed the scheme we have commented upon above. In so far as economic education is concerned Dandekar recommends a modest exercise of the following kind: 'I suggest that we should encourage and assist a few farmers in each area to maintain faithful records of cost and returns in their farm business....These records should be analysed and their economic meaning should be discussed with the active participation of farmers' (p. 192) with the aim of creating a cost-return consciousness among them.

Marketing, Pricing and Food Administration

In his Karnatak University Lectures Dandekar proposed a reform of food marketing with a view to combining free trade with social control through, what he called, District Foodgrains Marketing Boards which would be statutory bodies representing trading and producing interests. These Boards were to have monopoly of inter-district trade, while trade within the district was to remain free from interference. The state-governments were to acquire their stocks from the

Boards by exercising the right of preemptive purchase and use them for supporting the public distribution system (Pp. 281-284). Social control was to be exercised through Chief Administrative Officer and the Chief Accountant both representing the government on the Board.

Prof. M.L. Dantwala castigated this proposal as having a 'dreamland quality' and worse. He pointed attention to its extremely complex, bureaucratic procedures and expressed the fear that it might aggravate the existing disparities of consumption. He also showed that Dandekar's proposal instead of abolishing food zones which he himself disapproved, in fact gave rise to zonal restrictions around each district. Dandekar replied to Dantwala's critique extensively. In this book, however, he has gracefully added Dantwala's further rebuttal without offering his comments. This looks significant. Dandekar says he included Dantwala's reply so that the reader should know that 'my somewhat acerbic criticism did not go unreplied (p. 289)'. But it may mean more than that — he may have rethought his position. In any case he has called his Karnatak University lectures as 'dated'. We need not therefore spend more time on this controversy.

In respect of the general question of national agricultural price policy Dandekar's main recommendations are: the country as a single market, guidance of production through open market prices, support prices close to 'long-run equilibrium' prices, and issue prices of foodgrains not very much below the ruling market prices. Under this regime the function of price-fixation by the government is purely and exclusively stabilisation of prices. For all practical purposes the market rules the roost. His criticism of official policy has been directed to attempts, all these years, to keep prices consumer—oriented rather than producer—oriented. This, according to him has removed producers' incentives, harmed long —term interests of agriculture, distorted relative prices and consequently, production structure.

Of course his scheme, he admits, although it achieves equitable distribution between surplus and deficit states and between surplus producers and non-producing consumers, would leave the poor and the unemployed high and dry. But to achieve equitable distribution between income classes, '.... the right and proper thing to do is to achieve better distribution of purchasing power, that is, a less unequal distribution of incomes than at present. For this, we need an income policy and an employment policy' (p. 287). In fact the two amount to the same thing. 'An income policy means assuring a national minimum income to everybody. An employment policy means ensuring that everyone will get the national minimum, as far as possible, through gainful employment' (Pp. 287-288). (It is here that Dandekar presages his later idea of guaranteed employment.)

Until this policy materialises the vulnerable sections will need protection and therefore the fair price shops must cater to their needs alone (p. 288).

Backward-Bending Supply Curve

Dandekar's another foray into theory is his piece on the backward-bending supply curve of foodgrains in underdeveloped countries which he wrote in response to two articles - one by P.N. Mathur and Hannan Ezekiel and the other by Deena Khatkhate.

The Mathur-Ezekiel hypothesis ran as follows: Farmers on the margin of subsistence in poor countries are always short of food and yet they have to sell part of it in order to satisfy some 'fixed' cash needs. Thus they have to cut their already inadequate consumption of food under duress. In such a situation when prices of foodgrains rise, cash realised from a smaller sale of foodgrains would be enough to meet those cash needs and a somewhat larger amount of food may be consumed. Thus when prices rise, sales fall off. The opposite happens when the prices fall — a larger amount will be sold to obtain sufficient cash. 'Thus prices and marketable surplus tend to move in opposite directions' (p. 310).

In a footnote Mathur-Ezekiel present some empirical data from the Farm Management Studies conducted at the Gokhale Institute of Politics and Economics. Dandekar first shows that the data do not pertain to foodgrains but to agricultural production as a whole. If foodgrains are singled out for examination, quantities sold in fact show large positive price elasticities!

Coming back to the theoretical argument Dandekar shows that if a class of farmers such as the one described by Mathur-Ezekiel exists, it has very little effect on the total marketable surplus because, although numerically large, the area and production of foodgrains under their control would be very small. Quoting the same source, he shows that large farmers above 30 acres constituting less than 25 per cent of all farmers control over 60 per cent of the area and over 80 per cent of the marketable quantities of *jowar*. At the other end, farmers below 15 acres are net buyers of jowar and not sellers. Between these two classes would exist the Mathur-Ezekiel class who contribute little to the marketable surplus.

Dandekar then subjects this residual to further examination. He removes the impression that exclusively food has to be sold in order to meet cash needs. Other sources of cash income for the poor farmers are sale of other crops, wages from agricultural labour, remittances, etc.

The Mathur-Ezekiel proposition would then apply only to a very small and special class of farmers — 'not too small, not too large; those who have very little other resources of cash income; who are, therefore, more or less pure foodgrains producers and whose total production is just about adequate to meet their total needs, including cash needs, which they satisfy through the sale of part of their produce' (p. 314). Evidently such a class would be still smaller and their contribution to the marketable surplus negligible.

It is thus obvious that Mathur-Ezekiel are generalising from too small a base.

And yet 'as a piece of pure argument' Dandekar finds the behaviour of this special and limited class 'interesting' and proceeds to analyse it.

Selling less when prices are high and more when prices are low, Dandekar explains, is in conformity with normal consumer behaviour if we consider income effects of price-changes. When prices of foodgrains fall the real income of the producer decreases and therefore he consumes a little less of everything including food. Thus he has a larger quantity to sell. If prices rise, his real income is higher, his consumption, including that of food, increases and he has less to sell.

Next, Dandekar subjects the supposed 'fixity' of cash needs to close scrutiny. He shows that the cash needs of the poor farmer can only be 'fixed' in the sense that there are certain 'irreducible minimum needs' which he has to satisfy. On them he cannot reduce his expenditure even if he has to go hungry. On the other hand, he will always want to spend more on both consumption and production needs, perhaps more on the latter, considering that he has needs of investment in better implements or repairs to them, or for wages to be paid to labourers. In other words, according to Dandekar, the cash needs are fixed downwards, not upwards. Since Mathur-Ezekiel assume fixity in both directions they imply that once those needs are satisfied the farmer has no further use of cash. As Dandekar shows this is not true. The farmer is not in a special category of human beings. 'It is a sheer myth that farmers or small farmers in underdeveloped countries respond very differently to normal economic stimuli' (Pp. 317-318).

A few observations are in order.

(1) Mathur-Ezekiel are clearly wrong in presenting data in a careless way.

(2) They are also wrong in blowing up the behaviour of a minuscule class of farmers to cover the entire agricultural economy.

(3) However, if the cash needs of farmers are assumed to be fixed both ways the Mathur-Ezekiel proposition does make sense.

From what Dandekar tells us about the Mathur-Ezekiel position it does not appear that they consider the farmer 'irrational'. Given the situation of the farmer, i.e., if he really needs only a fixed quantum of cash, his choice is perfectly rational. The supply curve may be 'perverse' but the farmer is not. It will be useful to keep this distinction in mind.

(4) The precise point where Mathur-Ezekiel assume abnormality, if not irrationality, is the assumption that the farmer has an upper limit to his wants. This assumption Dandekar has nailed and quite convincingly.

(5) If 'fixity' in Mathur-Ezekiel sense is assumed we can only say that Dandekar has offered only an alternative and perhaps a better explanation of the behaviour of the farmer. Can we say that the Mathur-Ezekiel interpretation is wrong?

(6) When prices change there are 'price' effects as well as 'income' effects. Dandekar seems to

ignore the 'price' effect and to carry on his analysis only in terms of the income effect. For greater accuracy he should have said that in the case under consideration the income effect *swamps* the price effect. That this should happen is quite possible because the farmer being considered is only a food producer and the food that he produces is his only real income.

(7) When Dandekar shows that there is no upper limit to what a farmer can spend, things become a little more complicated for the analysis. It is now no more the Mathur-Ezekiel situation; the farmer can do with more cash. When prices of foodgrains are rising he may be tempted to buy more of his requirements the demand for which had remained suppressed. So the price - effect is now more strongly in operation and may not necessarily be swamped by the income effect. The outcome, therefore, may be indeterminate.

Agricultural Credit

According to Dandekar the weaknesses of the agricultural credit structure are rooted in the agrarian structure. The non-viable farmers constitute a large part of that structure and concessional credit to them not only does not help them but also brings the entire system into peril under the crushing burden of overdues. The non-viable farmers must, therefore, be phased out of the credit system. Viable farmers should borrow from any source, co-operative or commercial bank, and co-operatives should not enjoy any special privileges. In other words concessional credit should go. Dormant societies should be liquidated and weak central banks amalgamated. What remains of the co-operative institutions should work at par and in competition with the commercial banks. Among commercial banks the State Bank of India with its wide network of branches should specialise in agricultural lending which covers processing and exports too.

Regarding recovery of overdues Dandekar has a novel suggestion to make. Earlier suggestions in regard to this had proposed statutory provisions for creating a charge on the land of defaulting cultivators and its public auction or setting up farming corporations for purchase of lands. Dandekar fears that these measures may be politically unacceptable. As an alternative which is less humiliating to the defaulter and more practicable, he proposes setting up of a service by the banks to help sell the land of the defaulter. The intervention by the bank would get the defaulter a higher than distress price. Stamp duty on these transfers should be waived on the condition that the seller agrees to deposit the proceeds with the financing institution for a period of five or ten years. 'The purpose is not to allow the seller to spend his sales proceeds and become destitute. It is likely that if a small, marginal and sub-marginal farmer sells his land and keeps the sales proceeds in a fixed deposit with a bank, he will be better off than if he continues to cultivate the land...' (Pp. 368-369). The land will be purchased by viable farmers, thus improving the agrarian structure.

It will be seen that this solution ties up with Dandekar's overall design of removing the excess farming population and abolishing petty farms through a guaranteed employment policy.

Future Agricultural Policy

The last chapter may be said to present the latest and most mature ideas of Dandekar on various aspects of agricultural policy. Whatever the utility of ceilings and tenancy legislation when they were proposed, he now considers them out-of-date. He centres attention on the farmer whom he considers the lynch-pin of agricultural growth and stresses the creation of congenial environment which will allow him freedom to grow. 'Hence the first item on the agenda of future agricultural policy should be the existing ceilings on land-holdings and tenancy laws; they should be removed altogether or should be relaxed in stages' (p. 373). He is now in favour of capitalist farming but fears exploitation of labour; all the same he feels that the latter can be checked if labour is given a 'support price' in the form of guaranteed wage employment on public works.

In connection with marketing and prices his latest position is forcefully expressed in the following: 'However maligned the word "market" may be and however the makers of agricultural policy over the past four decades may have shunned it, "market" is the only presently known

institution which can take into account the several factors (which the Commission on Agricultural Costs and Prices (CACP) is supposed to take into account), make ... the necessary dynamic adjustments, and determine a price which clears the market ...' (p. 380). Only the 'excesses' of the market should be corrected, i.e., the function of the price-fixing authority should be only to stabilise the prices. Of course he still wants a 'certain degree of social control' (p. 381) but he does not elaborate what form it should take.

For marketing reform Dandekar now focuses on Agricultural Produce Market Committees and, in addition to the function of checking malpractices and ensuring a competitive price through open auctions, invests them with an additional function of stabilising prices through announcement of support prices and loading and unloading of stocks at appropriate times. The new electronic and telecommunication devices, he feels, can now help in determining support and ceiling prices and also in bringing about a reasonable uniformity in prices all over the country through trade between Market Committees. The Food Corporation of India should acquire stocks from the Committees in exercise of the preemptive purchase right so that normal free market processes are not disturbed. The stocks should be rotated through fair price shops.

He is for removing the food and the fertiliser subsidy but draws attention to the fact that 'almost everything in this country is subsidised ... (especially) higher education, including technical and medical education' (p. 391). He wants non-agricultural capital to enter into agriculture in a large way — even foreign capital along with foreign management in areas of non-conventional agricultural exports like fruits, vegetables, flowers milk and milk products, and meat and other animal products. 'Here foreign collaboration will be most useful because thereby our workers will be trained in necessary processing and packaging and we shall become aware of international standards of hygiene' (p. 398).

Concluding Observations

The above survey of Dandekar's contributions to Agricultural Economics in India reveals a shift

in his social philosophy from the early days to the present. He has travelled from technocratic and bureaucratic solutions to more humanistic ones. (One recollects that in his *Poverty* he had thought of communism as the 'classical solution' to the problem of poverty but rejected it because of its 'political costs' [Dandekar and Rath, 1971, Pp. 144-145].) As we noted earlier, his plan of reorganisation of the production structure, a massive engineering effort on 'sizeable agricultural regions', placed the efficiency requirements of land at the centre and reduced the human being, the farmer, to a cog in the wheel. In the context of utilisation of surplus labour he had said, 'I am not sure that all this can be done without disturbing the family farm organisation in this sector' (p. 114). His proposal of District Marketing Boards was similarly a strait-jacket. However, in the introduction to the series and in the last chapter of this book we meet the ripened and mellowed Dandekar declaring his faith in the free, enterprising and innovative farmer as the driving force behind a dynamic agriculture. He is even ready to castigate the planners' 'socialist animus' against private capital (p. 396).

It is not as if, even earlier, Dandekar had totally ignored the human side. His disquisition on limitations of agricultural planning, especially his plea to recognise the existence of a line which divided things which were under the control of planners from those which were not, are evidence of his preference for 'indicative' as against 'directive' planning. But he wavered between imposing discipline and allowing spontaneity. In the end the die was cast in favour of the 'market' which now according to him, is 'the only known institution which can *take into account* the several factors...' (which the CACP was supposed to consider while fixing prices) (p. 380). This is reminiscent of prof. Hayek's description of the market being the only agency which pooled and utilised decentralised and fragmented knowledge. It is more than likely that Dandekar gained this realisation independently of any outside intellectual influence.

In one of his aspects Dandekar was what I would like to call the 'itinerant economist'. He talked to rural audiences on prices, on water distribution,

on co-operatives and on almost every problem that affected their lives. He moved about incessantly getting a first hand feel of rural life. This quality marked him off from the generality of (even) the agricultural economists. Surely, he was singular in this respect. The insights which he gained from the itineraries and observations do not all find a place in this book, but a couple of them deserve notice. One is found in his description of deteriorating agriculture from out of which grew his theoretical critique of Schultz. The other is his sociological observation about how even an energetic and capable farmer may find his initiative cramped because of surrounding poverty which bred jealousy and hostility. Non-economist observers of the rural social scene like S.M. Mate [1949, Pp. 119-120] and T.N. Atre [1915] had commented on this side of rural psychology; it was left to Dandekar to relate it to economic life.

Dandekar's theoretical contributions are few. Which is a pity considering his undoubted native ability and acquired equipment. He went on flitting, in butterfly fashion, from one subject to another. One senses in him an inner compulsion to react to every development. His exercises, of course, were never superficial; they were generally adequately backed by necessary homework. (So the butterfly simile does not run on all fours.) And yet the fact remains that he did not immerse himself in any subject for long; he stayed with it only until the next beckoned him and the next did not take too long acoming in all the crowded years of the post-Independence era which almost exactly overlapped with Dandekar's academic life.

There must be another reason. He nursed a passion for teaching and his audience spread far beyond his classrooms. This consisted of people and leaders from all walks of rural life. On the active side of his personality the Indian School of Political Economy must be considered his life's work and it arose from out of his deep faith in public education. Now, a disproportionate interest in teaching can be inimical to contemplative thinking both in terms of time and a relaxed frame of mind. Teaching presupposes convictions, decisive postures — and they must be formed quickly because the next gathering is awaiting

you. One must say that public education both by word of mouth and by writing, formed a large part of Dandekar's life to the detriment of scholarly isolation. (At the time of his sixtieth birthday he had confessed that he had not been 'much of a reader'.)

A word on Dandekar's style of writing will not be out of place. He writes with perfect clarity — a reflection of the fact that there were no cobwebs in his own thinking. A tight logical thread holds the argument together. His piece on the backward-sloping supply curve is a model of building up an argument step by careful step. In the Introduction he says, '... I wrote without much sophistication' (p. 28). This is true. His natural tendency is to avoid jargon; he mocks those who use it in excess. He is scornful of ambiguity, circumlocution and euphemisms in others' writings; he is himself totally free from them. He could have well described himself as 'a plain blunt man'. His English is forceful, economical and precise. And then there is the polemics with its thrust and parry, cutting sarcasm, stinging retorts, some very 'palpable hits' and an occasional flippant remark too. Dandekar is at his stylistic best when duelling.

With uncharacteristic modesty Dandekar says in the introduction that 'there is little outstanding in what I have written' (p. 28).

I wonder. As I reflect on this statement, at least two things come to my mind with great force, both that stand to his credit.

One is his role as a continuous critic of Government policies. Also, this is a role which he acknowledges himself as having played with a hint of not misplaced pride. 'Over this period I have written and spoken almost as a professional critic of Governmental policies and programmes somewhat like an iconoclast' (p. 27). This is a substantial service. He was occasionally rash, sometimes unnecessarily combative and abrasive but on the whole constructive and practical. He could penetrate to the essential ingredients of a problem and expose it to clear daylight. Valuable, in this context, are the six or seven pages which contain his proposals for farmers' education and in their light his criticisms of our extension apparatus (Pp. 187-193). He goes right to the heart of the matter in his discussion of inculcating the

scientific attitude among farmers. 'Instruction in such basic scientific aspects requires many aids. However, if for reasons of economy, we must choose one single instrument, it seems to me that the microscope is the most potent of them all. It offers a real peep into the working of nature and lays bare many of her secrets. Its impact is direct and immediate, because the experience is first-hand' (p. 191). Another very practical suggestion of his is in respect of banks providing a service for arranging the sale of defaulters' properties and the defaulters being made to deposit the sales-proceeds with the banks.

Having myself observed and studied poverty a bit, I have remained, for a long time, enamoured of Dandekar's thinking on the subject. I suspect that this will remain the chief monument to his memory. Reference has already been made to it above but at the cost of some repetition let me try to state its significance as I see it. He starts from a very simple, almost jejune, observation that agriculture is overcrowded and that this is the basic cause of its malady. He then works out the merciless logic of population growth, derisively echoing Schultz's 'stationary equilibrium' with his 'ultimate equilibrium' in which both land and man are reduced to their 'irreducible minima' (p. 111). The 'vicious circle' approach to back-wardness was in the air when Dandekar wrote but perhaps he alone had the daring to see and state the ultimate unpleasant end of it all. His analysis, on the one hand, raises, once again, the perennial question of the applicability of mechanistic models to social phenomena; on the other it perhaps offers a clue to the disappearance of some tribal societies from the face of the earth, purely through the internal dynamic of population growth. In any case the insight is richly sug-gestive. Further, it brings the Indian reality into our view in all its nakedness.

This prostrate man in the 'ultimate equilibrium' occupied the centre of his thinking. It is well-known that he (along with Rath) made the first ever estimate of the dimensions of poverty. But then, in conformity with his practical genius he carefully examined the several approaches to poverty eradication and showed up their futility.

Finally, he proposed his own plan of guaranteed employment, not forgetting to calculate its costs and its implications for the fiscal system. Thus he gave a whole package almost on a platter. This was twenty-five years ago.

This analysis and prescription does not fall within the scope of the present book; however, it is necessary to keep in mind that it underlies it. The policies that the book under review recom-mends are postulated on the implementation of Dandekar's poverty removal plan. Himself free from the 'socialist animus' the recipe of the mature Dandekar in respect of agriculture now amounts to a happy combination of government action in a critical area and free private enterprise.

This is a sensible and feasible socialism largely ignored in all these years by both the right and the left. The Government newly installed at the centre may not have even heard of it. And so we go on repeating the same mistakes, treading the same fruitless paths which will do nothing to tackle the core problem. Dandekar thus bids fair to remain a prophet unhonoured in his own country. But those who appreciate his perspicuous and bold design will long cherish his memory.

NOTES

1. The original Marathi paper was published in *Arthasam-vad*, Vol. 1, No. 3, October-December 1977. The English version appeared in *Economic and Political Weekly*, Vol. XII, No. 53, December 31, 1977. Neither in print nor orally had I any reaction from Prof. Dandekar.

2. For further elaboration on co-operative farming, *vide* Deshpande, 1977.

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BOOK REVIEWS

Baviskar, Amita, *In the Belly of the River : Tribal Conflicts over Development in the Narmada Valley*, Oxford University Press, Delhi: 1995; Pp. xvi+286, Rs 475.

I am not a student of sociology or anthropology. But, I am interested in the Narmada valley problem, particularly from the angle of the tribals in the hills which are to be submerged under the Sardar Sarovar. I took up this book to read because the title says it is about tribal conflicts over the development in the Narmada Valley, and the fly leaf says, amongst other things, that the book seeks to answer questions like, 'How do people, whose struggles are the subject of theories of liberation and social change, perceive their own situation? Do their present circumstances allow adivasis to formulate a critique of "development"?' And, I am not disappointed.

The study is based on a year's field work when the author stayed in a small tribal village, in a tribal's household, observing, noting as well as helping and participating. The book consists of ten chapters and an epilogue besides a couple of appendices. The first chapter is devoted to the methodology of research (remember that it is basically a Ph.D. dissertation). The next three chapters are about history: history of Indian economic development, of the hill tribals in the Narmada region, and the influence of Hindu social structure and customs on the hill tribals. The next three chapters depict the present day community, economy and ideology of the hill tribals of the region as exemplified in the life in Anjanvara, the village where the author lived for her field work. The next three chapters are about the conflicts and struggles that characterise their present existence: the conflicts for honour within the community, the conflict with the state about rights on forest land, and the struggle against the Narmada Dam project. The final chapter sums up the findings and presents the author's overview. Every chapter contains illustration of the general point made (or, what some would like to think of as 'data') in small print.

The introductory chapter states that there is no single objective reality, but multiple realities, an attempted synthesis of all of which may not arrive at a unified truth. What the author tries is to present one facet of this reality : ways in which adivasis regard the state, essentially as a corrective to the surfeit of accounts of the other type. Even in doing so, the author is very self-conscious, conscious about the researcher's biases and ideological presumptions, and tries to both spell these out and keep them under control as far as practicable. The result is an honest account; but, such an account perforce must stop short of looking far beyond the contradictory situations deciphered, which is what happens in this case.

The second chapter on development, poverty and the environment has two distinct parts : The first part contains a racy, stylized summary account of the process and pattern of economic development in India during the last five decades. This account may be characterised, to borrow the author's expression, as one facet of the multi-faceted reality of Indian economic development. Only, it is not the tribals' vision (presumably, they do not have one), but a vision of the Indian Environmentalists, as the author calls them. However, readers not sympathetic to or in agreement with this perception of the Indian economic development need not give up, but should continue reading, since the rest of the book is an enlightening account of the tribal scene in the Narmada region. The second section is a presentation of the position of the Indian Environmentalist which appears to marry the value of ecological conservation with Ecological Marxism muted by Gandhism in its celebration of technicism. The author formulated her research hypothesis after being influenced by these theories. But - let me quote her selectively, to save space: 'I expected that adivasis acted politically in response to their experience of development - a process which has resulted in the alienation of their natural resource base and their subsequent cultural impoverishment......While the (Sardar Sarovar) dam was a part and a symbol of development, the movement against the dam seemed to embody cultural resistance and an alternative to development........I intended to go to Narmada valley and, by living with the adivasis, discover their relationship with nature, how it changed with their experience of development (which included the dam), and their struggle to create an ecologically sustainable and socially just alternative world.......On going to the Narmada valley, I discovered a somewhat different

reality....Fieldwork revealed that there were several different levels of politics, and that it was essential to incorporate all of them into the study in order to better appreciate adivasi life.....More disconcerting, though, was the rapid discovery that adivasi life was not at all what I had imagined it to be.... Therefore, my near theoretical framework linking nature-culture relationships to political critique, action and change, crumbled into an untidy jumble of contradictions. The disonance between my romantic notions of adivasis, based on scholarly writing on the subject, and the everyday lives of adivasis, led me to ask the questions that run through the subsequent pages'.

The third chapter is a brief history of adivasi-state relation in the region through centuries. Originally the valley as well the hills around Narmada were covered with dense forest, where the ab-original Bhils lived by clearing patches of forest for agriculture (a phenomenon that must also have occured in most parts of India where there were no ab-original inhabitants). With the incursion of the Rajputs, fleeing from Muslim invaders, in the seventeenth century, the Bhil tribals were gradually pushed to the hills. This process continued till the British times, with the earlier Marathas making it more difficult for them in the plains. The pushing out of the Bhils from the plains to the forest in the hills was therefore a long process, and not one of recent origin. The chapter describes how the locals, most of them tribals were exploited through high land taxes, and how the Bhils developed a culture of resistance to such extractions. It also shows how a part of the Bhils was separated from the rest by the invading Rajputs marrying the Bhil women; the class of offsprings, called Bhilala, consider themselves superior to the Bhils. The exclusion of the hill tribals from their natural resource base in the forest by the British government making forests exclusive public domain multiplied the difficulties of the tribals, who were left with no alternative to illegal occupation of forest land for cultivation. New situations of conflict and compromise emerged. The Bhils in the plains gradually adopted the local dress and customs, thus being accepted as another caste, whereas the hill Bhils remained isolated in their traditional ways.

Attempts at Hinduisation in recent decades have not succeeded.

The fourth chapter discusses whether they are a caste or tribe. It is shown that while the Bhils in the plains have been assimilated as a caste, with its hierarchical structure, the isolated tribals in the forested hills have retained and strengthened their separateness. Their fortitude in the face of adversity in the hills has given them not only strength but also a religion that is local and theirs. While Narmada is recognised as *mata*, there is nothing in their rituals in recognition of this status. The *mata* phenomenon, not related to Narmada, is discussed in detail to bring out both the acceptance of and resistance to Hindu influences.

The fifth chapter is devoted to community and the politics of honour. The village consists of families usually descended from one patriarch belonging to a particular clan. Economically the village is fairly egalitarian, and every household helps every other on specific agricultural operations when family labour is inadequate for the job. But, while on the one hand this exchange of labour is lifted up into the status of a symbol of social solidarity, on the other the social differentiation peeps through the richer households sending their younger members for such work but the poorer ones sending their able bodied adults. Relatives help at the time of distress. Relation with other villages is mainly through marriage. There is a description of marriage and its strains; the bride price is an important matter for negotiation between two villages. Feuds, arising out of drunken misbehaviour, over women, over caste (Bhilalas considering themselves superior to Bhils), relate to honour. The chapter shows how this honour is both an ideology (in that it is a basis of political organisation) and a capital, both symbolic and material (as, in form of compensation for insult). The types of situations described here, I think, are not uncommon in non-tribal villages. What possibly gives these the great importance in the tribal society is its economic and social isolation in which these are the dominant problems.

The chapter on economy and ecology gives a graphic description of the agricultural cycle, the employment seasons and pattern and the dependence on the forest and the river (mainly for

bathing and fish), and on the external market for consumables and for seasonal earning as wage labour. The detailed account is of what is called 'nevad', that is forest land illegally cleared for agriculture. The author describes the slowly declining productivity of this land, that runs counter to the picture of balanced ecological use of land by the tribals. She brings out the unre- sponsiveness of the state to the underlying inadequacies of the situation as well as the lack of understanding of the villagers about the dan- gers in the long run.

The contradiction between tribal thinking and behaviour is brought out in the seventh chapter that describes the relation between nature and ideology. The 'indal' puja is a worship of the union of the rain and earth that brings forth the grain. (I am reminded of the *Raja sankrant* in some parts of non-tribal India when, at the start of the rainy season, land is considered to be fertile to receive the seed). After describing in detail the puja and the 'gayana', a song of nature's creation, the author says that 'at the level of belief and practice, there is little acknowledgement of eco- logical change'. That beliefs and faiths are being undercut is illustrated with the example of local medicine and allopathic drugs.

Against this background of Bhilala life, beliefs and contradictions, the author describes two dif- ferent types of politics, other than the politics of honour, brought about by external forces and external agencies - the Khedut Mazdoor Chetna Sangath, and the Narmada Bachao Andolan, in two chapters. The Sangath was started by two voluntary agents to help the tribals fight the forces of the state to assert their rights on the forest land that they have occupied for cultivation. This is a story of extortion by the agents of the state from the tribals, and the refusal of the state to acknowledge their right to the land without which living will become impossible for them. It is a familiar story. There are, however, two interest- ing aspects to it. One is the effort by the Sangath to persuade the tribal farmers on the one hand and the forest officers on the other to slowly but steadily plant trees on the 'nevad' land as a step in the direction of checking degradation through erosion. While the tribals began, it collapsed due to the non-co-operation of the forest officials. The

other is the effort of the outsider voluntary agents to withdraw, leaving the Sangath in the hands of the tribals themselves, with a decentralised organisational structure. While three or four persons from amongst the tribals have emerged as leaders, with understanding and organisational skill to take up the leadership of the Sangath, the village level organisations have been ineffective. The author considers both these as matters serious enough to ponder over. It does not show 'adivasis living in harmony with nature, combining rev- erence for nature with the sustainable manage- ment of resources'. Nor does it demonstrate the ability of decentralised local bodies to actively plan for and organise themselves.

The next chapter is about the Narmada Bachao Andolan and its perception, and role of the tribals in its vision of ecologically balanced develop- ment. The chapter contains a summary account of the origin and growth of the Andolan. It mentions that the Andolan began as a movement demanding proper rehabilitation of the oustees from the reservoir site. It mentions that under pressure of the movement the Gujarat govern- ment had accepted the basic principle of resettling the oustees with land in the command area of the irrigation project. Indeed, it mentions that people from some villages had gone to Gujarat to inspect the lands to be made available for resettlement. But, it merely states that they came back dissa- tisfied, without giving any further details. If, under public pressure, the state had made 'fairly progressive' provisions for rehabilitation, it could have improved under further pressure, and so could have been the actual implementation. But, the movement came to oppose the entire scheme not only because it thought it was impossible for the state to rehabilitate all the affected people, but much more because it got linked to 'a general analysis of the class character of capitalist development, and of the appropriation of natural resources by a state which serves the interests of national elites and foreign capital. Large devel- opment projects are seen as symbols and synec- doches for the more gradual process of commodification,   resource-intensive industrialization and urbanisation.' 'While rais- ing questions about social justice and ecological sustainability, the Andolan challenges this

ideology of development'. In describing the movement in both the region of the hill tribals which contains only one-third of the oustees, and the plains of Nimar which contain two-thirds of the oustees, the author refers to a number of contradictions. The tribals in the hills are resource poor, deprived and isolated and therefore are struggling to save what little they have. But they have no notions of sustainable land use, and do not practise it. The *patidars* of Nimar, on the other hand, are mostly better off farmers who have made good through electricity and irrigation pump sets, multiple cropping, use of improved seeds, fertilizers and pesticides, all characteristics of unsustainable development. Though complaining about debt, they 'also narrate a different tale - of increased assets, improved standards of living and overall optimism'. Even the landless labourers, including the Bhils, have a better income position, thanks to this type of agriculture in the plains, and are therefore unenthusiastic about Andolan. The *patidars* are the big supporters of the agitation, its chief financial stay, since they stand to lose this developed agricultural land. They have nothing to do with the Andolan's critique of development, which is contrary to their present day interests. They employ labour at much less than the minimum wage, and manage to get strict implementing officers transferred. 'Social justice is sidelined'. Understandably, the Andolan has 'showcased the hill adivasis...and downplayed the presence of the Patidars'. The Andolan has brought together mass based organisations and domestic and foreign intellectuals in making explicit the connection between particular grassroots movements and a broader analysis of development. But, says the author, 'It must be noted that this critique of development has been formulated by the activists in the movement and by supporters outside the valley; it is not the creation of people in the valley, both adivasis and non-adivasis who understand the issue of displacement in a much more particularistic way'. Non-co-operation of the Gandhian type also does not always work: the Nimar Patidars were *reluctant to abstain from paying electricity bills*, for obvious reason. There is little decentralisation of decision making; the outsiders mainly run the show. The attitude seems to be, 'You run the

Andolan; we will contribute our mite'. On the whole, says the author, 'The formulation of a critique of development is not a concern of the people in the valley; they are fighting as they have always fought - against outside oppression'. To appropriate the struggle of adivasis as manifestation of this critique of development, says the author, 'however politically effective in securing the support of the intelligentsia, results in the reification of the grassroots, a reification that in many ways is theoretically and practically problematic'.

In conclusion, therefore, the author decries the effort of intellectuals to '"read off", or read into, the everyday experiences of the adivasi life an ideology that is derived from an external critique of development'. 'In trying to demonstrate that the critique of development actually exists in the lives of adivasis, intellectuals end up creating caricatures'. Then how should one go about it? Says the author, 'While intellectuals as well as people in the valley stress that priority must be given to a need-based economy - a wholly sound basis for reorienting natural resource management, that in itself is not enough. The scale of the degradation of the land and forest requires a massive effort calling upon financial, technical and organizational resources - a magnitude that has been achieved so far only by the state. This leads us to seriously reconsider the strategic choices made by movements that want to stay clear of the sphere of party politics, moving perhaps towards a re-engagement in political struggles aimed at controlling state power, at least at the local level'. This appears to make explicit the muted formulation of the Sangath in its infructuous experiment with soil conservation on 'nevad' lands.

Starting with an ecological Marxist conceptualisation, the author has travelled long, unlearnt as well as learnt a lot, discarded some intellectual garbage, and finally come to terms with the tribal reality in the hills. Her final formulation may not sound profound; but it appears logical. In the present atmosphere of shrill, confused profundity, *it is in tune with what Cardinal Newman asked*: 'One step enough for me'. The author may be seeing more in the nature of difference in adivasi social organisation, religion and custom than I

might think warranted. But that is a minor difference. Readers unaccustomed to the stylised language of modern ecological Marxists should persevere, for it is a book worth reading till the end.

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Sundarji, K., *The Blind Men of Hindoostan, Indo-Pak Nuclear War*, UBS Publishers' Distributors Ltd., New Delhi, 1993; Pp. xii+246.

The purpose of this book is to promote a discussion on Indian nuclear weapons policy. After the nuclear explosion of Pokharan in 1974, India has continually asserted that further development has been in the peaceful uses of nuclear energy and not in the production of nuclear weapons. Meanwhile Pakistan has built a nuclear complex at Kahuta and it is asserted by some Pakistanis and many outsiders, particularly Americans, that she has a few nuclear weapons. The Government of Pakistan has admitted in recent times to having nuclear war capability and has also emphasised the fact that this is solely to protect herself from an Indian nuclear attack. She has repeatedly stated that India also has nuclear weapons and Pakistan's nuclear weapon policy is aimed at countering India's nuclear weapons.

India's response to this development has been to proclaim her innocence and seek international condemnation of Pakistan's actions. No serious international reaction to Pakistan's nuclear weapon policy has been forthcoming partly because she is a useful ally to the USA even after the end of the cold war and the collapse of Afghanistan as a state, and partly because she is being helped by China in her nuclear programme. On the contrary, pressure is being mounted on India not to develop nuclear weapons and sign the non-proliferation treaty and now the Comprehensive Test Ban Treaty (CTBT) so that India will be completely dependent upon the world policeman, the USA, in case of an attack by an openly hostile Pakistan and none too friendly China.

The essence of nuclear weapons is that they are deterrents and do not actually have to be used. The damage that even half a dozen bombs of the size that were dropped on Hiroshima (20 kiloton) can do is so horrendous that a nuclear attack cannot be made lightly, if it is known that the country attacked also has them and has the capability to use them. Therefore a country need not have too many of them - no more than what are needed to inflict unacceptable damage on the attacker. If it is known that India has them Pakistan may not use them unless she is in a really desperate situation.

General Sundarji elaborates that having the bombs is not enough; it is also necessary to have a delivery system, i.e., how they will be carried and dropped in enemy territory. Should they be carried in fighter planes, bombers or intercontinental ballistic missiles? This raises questions about range and manoeuverability There is also the question of safe deployment within the country so that a surprise enemy attack, even conventional, will not destroy the country's ability to strike.

If a country like India wants to develop nuclear weapons for deterrence it obviously means that she will not use them in the first instance. In that case the ability to sustain the damage of a nuclear first strike and hit back becomes crucial. This means that she will be able to avoid the panic that will be generated by the hundreds of thousands of people killed and injured, the devastation of property on a vast scale and have an institutional structure which will be able to organise the strike back even after the top echelons in the capital cities and the military organisation have been destroyed. If this can be done - and this is a tall order - and it is known to the attacking country, a first strike may not take place unless the country is in a really desperate situation or it is some sort of a misadventure!

General Sundarji makes out his case by playing war games between Pakistan and India. In the first scenario India does not have nuclear weapons but Pakistan has. The provocation for a conflict is Kashmir. India, tired of the increasing provocations in Kashmir through militants trained in Pakistan, *mujahideens* from the Afgan war and regular Pakistani soldiers on leave, wants to put

pressure on Pakistan and make her desist from such activities, by attacking vulnerable parts of Pakistan with the help of conventional forces. The element of surprise and the slight superiority which India has in conventional forces enables her to make sizeable gains of Pakistani territory. While Pakistani counterattack, attains some success in certain sectors, her forces are not able to stop the Indian advance in other sectors, particularly in the canal area. Therefore, they decide to use nuclear weapons. A bomb is dropped on the advancing Indian columns killing nearly 10,000 soldiers and another one on the Jodhpur airfield, killing nearly 80,000 people, to destroy India's air capability.

There is general international shock at this action. There is a flurry of activity in the UN. Pakistan claims it is a preemptive strike and this seems to be generally acceptable. India totally demoralised by the devastation accepts this humiliating defeat and agrees to withdraw its forces and hold a plebiscite in Kashmir. She begins to cope as best as she can with the task of treating the wounded and rebuilding the destroyed parts of the two cities. International assistance comes in rather vocally for this purpose.

The second scenario is one in which India also has nuclear weapons, enough in number to cause unsustainable damage to Pakistan. The difference is that while announcing the possession of nuclear weapons India also declares that she will never make a first strike. Simultaneously with developing nuclear weapons, she is also supposed to have developed all that goes with a capacity to make a second strike. The game follows the same pattern with embellishments here and there. In this game Pakistan strikes first under similar circumstances and drops nuclear bombs on Delhi (4 x 20 kiloton) and Mumbai (2 x 20 kiloton) for maximum damage. Simultaneously there are attacks on those places in India from where nuclear weapons can be delivered. Instead of panicking, India strikes back and destroys Islamabad and Lahore after making sure that Indian cities near Lahore, such as Amritsar, do not suffer from the radiation of the nuclear explosion. The end result is India: killed 1,025,800 and injured 2,078,700; Pakistan: killed 1,360,940 injured

2,760,000. Although the damage is relatively heavy in Pakistan because it is a much smaller country, in absolute terms the loss and suffering on both sides are the same. All this is described very vividly in terms of the confabulations of the top brass on the two sides - the two Prime Ministers, the two defence ministers, finance ministers, army, air force and naval chiefs, cabinet secretaries and defence science advisers, the examination of alternative war and diplomatic strategies, the actual warfare on the western front and the nuclear attack.

Does this make out a case for India's having its own nuclear weapons? Certain developments preclude too heavy a reliance on the US intervening in case of a nuclear attack on India. For instance, the insistence with which it seeks nuclear disarmament from North Korea and the destruction of Iraq's nuclear arsenal contrast strangely with the benevolence with which it views the Pakistani nuclear programme. Her readiness to act probably has something to do with the degree of friendship which the non-nuclear countries have with her. South Korea, Taiwan and the oil countries are friends of the US and therefore she will react with great urgency to any threat of a nuclear attack. Unless India acquires a similar status with the US, it is difficult to think that the US would react with any urgency in case of a nuclear attack. Secondly, Pakistan is an ally like Israel and therefore the nuclear proclivities of these two countries are tolerated. On the contrary, India is asked to cap her nuclear programme so that Pakistan can be persuaded to act in a similar fashion. There is thus a case for India's producing nuclear weapons for deterrence rather than for mutual destruction.

Secondly, can India produce nuclear weapons now when there is intense international pressure for non-proliferation and complete test ban? As the examples of China and France show, determination and preparedness to face the consequences of defiance of international opinion can enable India to do so. For this she needs economic strength and a much larger presence in the international economy. Also a fairly united people behind the leaders. For, as General Sunderji's war games indicate, unless the people have the ability to bear the loss of life and devastation of a first

strike without panic or demoralisation, a second strike may not be possible even if the country possesses nuclear weapons.

The third question is whether Pakistan would make the first strike. It is answered that she will do so only if she finds a conventional war going disastrously against her. Is this likely when the Indian superiority is only marginal. Would not pressure be put on both to cease fire long before that?

The only possibility is that of a misadventure. General Sundarji gives the example of how the US almost launched a nuclear attack on the USSR because her warning system gave out wrong signals of a Soviet nuclear attack on New York and how disaster was avoided by someone remembering that Khruschev himself was in New York at that time. In such a case if we have nuclear weapons we can be as much liable for misadventures.

General Sundarji has written a very readable book. It enables the reader to appreciate the damage that can be caused by a nuclear bomb attack on Indian cities. He traces vividly the devastation which a megaton bomb dropped on New Delhi would cause. The fireball of the explosion would be visible as far away as Ambala, Jagadhri, Hardwar, Moradabad, Agra and Hissar. Its temperature, close to that of the sun, would burn severely the skin of those in the open as far away as Gurgaon, Najafgarh and Ghaziabad. Persons in the open closer to the centre of the blast (Connaught Circus) would receive such severe burns that no treatment can save them. There would be total conflagration within three to four kilometres which would include Rashtrapati Bhawan, Parliament House and all the surrounding Bhawans.

Within a few seconds of the blast, the heat radiation would spread outwards utterly destroying everything in its path. Within three kilometres of Connaught Place everything would be reduced to rubble. Between three and six kilometres a few of the smaller and more strongly constructed buildings might be left standing at crazy angles with many parts missing and twisted. Outside this radius large scale destruction would continue but with decreasing intensity. Fires would be raging across a radius of 15 km from Connaught Place. A second strike by India would require that all this and more will be handled somehow and she will be able to hit back. A tall order indeed!

These war games which General Sundarji puts across so dramatically revolve round Kashmir. One wonders if there is no solution to the Kashmir problem other then the mutual destruction of the two countries!

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Shah, Tushaar, *Making Farmers' Co-operatives Work*, Sage Publications (India), Private Ltd., New Delhi, 1995; Pp. 275, Price 325.

Even after a century and a half of their existence, the debate on the relevance of farmers' cooperatives in the present context and their usefulness to the farming community continues unabated among practitioners and academicians alike. The most striking feature of this debate is the fact that despite their myriad forms and structural patterns, and also varying degree of contents in socio-economic activities of cooperatives, the common factors among cooperators bring them together to discuss current issues from the primary to the international levels. Unlike the consumer and industrial cooperatives, which attract only the average consumer or the skilled artisans, the agricultural cooperatives seem to have attracted membership from the highly sophisticated and business oriented farmers of Australia and North America to the subsistence level farming communities of the Indian subcontinent.

One of the recent contributions to this debate is a scholarly treatise written by Tushaar Shah and published by Sage Publications. The research study is based on a large number of case studies and selected literature on rural cooperatives as well as empirical data and information derived from a cross-country sample drawn from the three identifiable regions of the country, viz., North India, South India and Western India. Because of

the able support provided by a large number of research students and the infra-structural facilities at the Institute of Rural Management at Anand (IRMA), Tushaar Shah was able to organise and complete this commendable study and make it available for the benefit of others in the form of the book under review.

Farmers' cooperatives in India will soon be celebrating the completion of their hundred years in India and will be looking back with some satisfaction on their achievements in several spheres of rural economy and related activities. The occasion will also provide an opportunity to examine why cooperatives have made commendable progress in certain sectors of rural economy, especially the milk and sugar processing industries in Western India, and at the same time have miserably failed in the North-Eastern India. An important factor for scrutiny would also be the controversial State Partnership element introduced in the Indian Cooperative Movement through recommendations of the All India Rural Credit Survey Committee and their positive and negative impact on the democratic functioning of rural cooperatives as well as on their capital formation through member contributions.

In his introduction to the book, Tushaar Shah discusses the approach to the book which, in his opinion, 'offers an alternative approach to the study of cooperatives. Its purpose is to evolve and test a theoretical framework to understand the working and performance of a village cooperative — or any other local organisation — as a live entity embedded in its social context' (p. 24). The emphasis is on the study of 'central tendencies' rather than 'extremes' and on bringing into sharp focus the inter-play of all the three elements of a cooperative, viz., members, managers and leaders. The study seeks to identify the 'ideal state' and embarks upon a search for 'exemplars' which can help approximate, for the lesser subjects, the ideal state through the 'quasi-positivist' method rather than the proper positivist method. The method employed is designed as 'quasi-positivists' for 'it involves a selective study of exemplars rather than a representative sample of subjects as the proper positivist method would suggest' (Pp. 26-27). This approach perhaps

could reduce the risk of generalising on the basis of a representative sample and provide for prescriptions which are feasible, non-trivial and contain an intuitive appeal.

The study refers to several researches already conducted in the quasi-positivist tradition into three categories, viz., The Leader-Manager School, the Cooperative Principles School, and the Domain-Context School. It also refers to the Attwood-Baviskar thesis which concentrates on the study of successful cooperative areas of Maharashtra and Gujarat and ignores the hidden failures among these successes. Too often we tend to generalise on the successes in Western India which essentially centre around the processing cooperatives and not on the average Indian village cooperative.

Putting certain categories of cooperatives as successful and others as failures has deprived us of the attitude to study objectively the cooperative as a single entity with its unique characteristics and its achievements and failures. The strength of the Cooperative Movement can only be judged by the successes of average farmers' cooperatives by applying to them the criteria applicable to member-owned and democratically controlled organisation striving to serve the members to improve their socio-economic status through increasing productivity and also through better returns on the marketable surplus. Looking at the cooperative through a doctrinal approach has done more harm than good to cooperative functioning. The study attempts to look at a cooperative not 'as a mere piece of flotsam tossing around in response to external stimuli' but 'by viewing the cooperative as a social organism with a life and logic of its own' (p. 34).

The categorisation of the existing studies into the above-mentioned three schools is interesting. The question is: can any of the three schools claim success of their cooperative exclusively through the Leader-Manager partnership, or through the rigid adherence to Cooperative Principles alone or through the Domain-Context approach to cooperative functioning? The answer would have to be in the negative. The focal point in the running of a cooperative may be any of the three attributes for success, but certainly the success was not achieved by exclusion of the positive aspects of

the other two schools. The leadership provided by the Leader-Manager combine could help organising tremendous manpower and resources to bring about the Domain-Context situation in cooperative management. Also, the values and principles were the guardians on call for these leaders and managers when they looked for guidance as to how a cooperative enterprise should be run to keep it distinct from a private firm. In essence, a successful cooperative entails the healthy fusion of all the three elements into a fine blend to ensure success of the type we have witnessed in some parts of our country.

Principles for Good Business

The paragraphs under The Cooperative Principles School display some skepticism about cooperative principles being principles of good business. Reference has also been made to one or two papers in support of this statement. However, a galaxy of writers on cooperatives all over the world have established, time and again, that the Cooperative Principles, if followed in conducting business, have conclusively proved to be principles of good business. The Cooperative Principles, as approved by the International Cooperative Alliance, are time-tested guidelines for running business on ethical lines. These Principles are not something distinct from basic human values of honesty, integrity, caring for others and self-help. They are a set of codified self-regulatory socio-economic paradigms for a non-exploitative society. Even the first cooperative, established over 150 years ago at Rochdale, would not have succeeded if they had not adopted and practiced these self-regulatory guidelines which later found world-wide acceptance in the form of Cooperative Principles.

One can argue that the International Cooperative Alliance (ICA) has been particular about a cooperative's adherence to the Cooperative Principles while admitting the said cooperative to its membership. This applies to all national and international organisations and there is nothing dogmatic about it. On the contrary, the ICA has been very considerate in approving membership applications and has often accepted very liberal interpretation of these Principles by National Member Organisations. If we look at the list of ICA members the world over, it will be quite clear that where the ICA was convinced that a cooperative is well on its way to finally moving towards managing its affairs in accordance with the Cooperative Principles, it has not hesitated in admitting such an orgnisation to its membership.

The Centennial Congress of the ICA held at Manchester in September 1995 has once again revised the Cooperative Principles on the basis of the findings of a global study made by Prof. Ian MacPherson of Canada. While presenting his report to the Congress, MacPherson said, 'I urge you here and especially after Congress, therefore, to think of the Principles as active catalysts and not just regulatory maxims. I firmly believe that the Principles before you represent a relevant amalgam of what the cooperative founders espoused for their Movement, of what common practices have been found valuable and of what we can employ as a strategic advantage in the world around. Far from being a constraint on what we do, as some might argue, the Principles will give us the insights and dynamism we require to become even more valuable in the future to the human family around the world'.

It has to be remembered that a cooperative is an economic organisation and unless it succeeds in bringing economic advantages to its members through its services, it has no purpose to exist. It is a users' organisation conducting its business on democratic lines. Those cooperators in India, who pioneered, nourished and developed the Cooperative Movement during the post-Independence period, did so with full faith in cooperative ideology, in strict adherence to the Cooperative Principles and, in management of cooperatives, with meticulous care on sound business principles. Mention could be made here of the Late Vaikunth Mehta who was not only an ardent follower of the Cooperative Principles but also an able manager of a large sized cooperative bank at the apex level. Working within the limits set by the value-based Cooperative Principles did not come in his way in developing not only the apex bank but also several other organisations at various levels.

During recent years, there is a growing impatience among professionals managing large-scale

cooperatives. They do not want the democratic processes to restrict their freedom to make commitments and take speedy decisions. Granting the delays caused due to time-consuming decision-making processes, the professionals have to bear in mind that cooperatives just cannot function as joint-stock companies and the decision-making process has to be gone through. That there is a need to streamline the decision-making process is another matter.

The other reason for this impatience is the inability of professionals to raise funds from whatever source they think feasible in order to ensure adequacy of capital at the desired time. During the recent revision of the Principles, even this freedom has been conceded provided, of course, that in raising funds from other sources care has to be taken to see that the control on the capital of a cooperative remains with the members. Whether outside investors would invest in cooperatives without getting in return a right to vote or a share in management is a question only future dealings can help to answer. And if the members lose control over finances of a cooperative, can it be called a cooperative? The ICA Congresses which met in Tokyo and Manchester have been debating this issue and the consensus has been that so long as the members are able to keep control over a sizable portion of their capital, the cooperatives have the liberty to raise capital from other sources.

It seems rather strange that cooperative leaders and managers should look towards their competitors, namely, the joint-stock companies as their models for development of financial and business activities. They should rather look towards their members to ascertain member needs and serve them in the manner the members desire and not be guided by their competitors. Growing big is not a cooperative's goal, it is indeed to serve the member in a big way.

Revised Cooperative Principles

As the ICA has recently revised the Principles, it would not be out of place to reproduce them here in order to see if any of them are so designed as to have a negative impact on the growth of any cooperative business. The ICA *Statement on*

Cooperative Identity is as follows:

Definition: A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social ad cultural needs and aspirations through a jointly-owned and democratically controlled enterprise.

Values: Cooperatives are based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. In the tradition of their founders, cooperative members believe in the ethical values of honesty, openness, social responsibility and caring for others.

Principles: The Cooperative Principles are guidelines by which cooperatives put their values into practice.

First Principle: Voluntary and Open Membership: Cooperatives are voluntary organisations, open to all persons able to use their services and willing to accept the responsibilities of membership, without gender, social racial, political or religious discrimination.

Second Principle: Democratic Member Control: Cooperatives are democratic organisations controlled by their members, who actively participate in setting their policies and making decisions. Men and women serving as elected representatives are accountable to the membership. In primary cooperatives members have equal voting rights (one member, one vote), and cooperatives at other levels are also organised in a democratic manner.

Third Principle: Member Economic Participation: Members contribute equitably to, and democratically control, the capital of their cooperative. At least part of that capital is usually the common property of the cooperative. Members usually receive limited compensation, if any, on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes- developing their cooperative, possibly by setting up reserves, part of which at least would be indivisible, benefitting members in proportion to their transactions with the cooperative, and supporting other activities approved by the membership.

Fourth Principle: Autonomy and Independence: Cooperatives are autonomous, self-help organisations controlled by their members. If they enter into agreements with other organisations,

including government, or raise capital from external sources, they do so on terms that ensure democratic control by their members and maintain their cooperative autonomy.

Fifth Principle: Education, Training and Information: Cooperatives provide education and training for their members, elected representatives, managers and employees so they can contribute effectively to the development of their cooperatives. They inform the general public, particularly young people and opinion leaders, about the nature and benefits of cooperation.

Sixth Principle: Cooperation Among Cooperatives: Cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional and international structures.

Seventh Principle: Concern for Community: Cooperatives work for the sustainable develop- ment of their communities through policies approved by their members.

The Principles have great flexibility and wide scope for liberal interpretation. Growth of an organisation beyond certain limits or professionalisation of its management are no excuses to disown the cooperative way of functioning. The real situation is that the blame for failure due to human weaknesses for power and also due to desire for freedom from control, is passed on to the Cooperative Principles.

Criteria of Performance

The chapter on 'The Goal of a Cooperative' in the book under review deals, very elaborately, with the various approaches adopted by researchers while conducting the case studies. However, a central point of enquiry is conspicuous by its absence. While the study mentions five broad criteria of performance which repeatedly occurred in the case studies, the question of membership participation in the economic and social activities of the cooperative is not promi- nently posed. The assumption that economic advancement of a cooperative and its viability are firm indicators of member participation in all its activities is not supported by facts in most cases. There are many large-sized cooperatives, especially the so-called marketing cooperatives which

thrive on distribution of regulated commodities or on agency business, which have very marginal participation by their members in most of their activities and least of all in marketing their produce. The member seems to be the last person of concern to cooperatives, governments, and also, to many researchers alike in their search for viability criteria and performance appraisal. No wonder then that '(t)he actual descriptions provided by many case studies, however, suggested that while each of them had some relevance to performance, these criteria failed to capture the essence of success and failure in cooperatives' (p. 39).

Learning from the inadequacies of the approaches in the earlier case studies, the present study's 'basic purpose is to understand coopera- tives - how they behave, act, decide and respond to stimuli. Therefore, like any social enquiry, we too began with the question: What do coopera- tives seek to achieve? Or, what is the objective function that guides their actions and behaviour? Or, what assumptions about, what cooperatives seek, best cover their actions and behaviour?' (Pp. 45-46). Chapter nine on 'Building Salient Cooperatives: A Framework for Action', has attempted to answer the question: Why Coop- eratives? It has outlined the Macro-Policy Framework, given a design of Federal Cooperative System and a pattern for Governance and Management of Federal System and Village Cooperatives. In conclusion, the study recom- mends reforms of cooperative laws, urges the cooperatives to 'resist efforts to impose the outsiders' agenda and macro-policy goal on themselves' (p. 268).

Synthesis and Overview

Chapter eight of the book brings out the essence of this study on the basis of empirical evidence and analysis of case studies sponsored for the research project. The region-wise findings of the study make very interesting reading and reveal to what extent macro-policy environment in a state, like Tamil Nadu with nominated boards, had vitiated the atmosphere thereby reducing most of the cooperatives to Captive Decision Unit (CDU) status which demonstrated 'low patronage

cohesiveness at all levels, low sense of empow-
erment at the village cooperative level, and
variable performance of the operating systems
depending mainly on the quality and attitude of
the staff and the secretary' (p. 237). Even rare
examples of successes were attributed to diligent
secretaries or populist administrative decisions.
This was in sharp contrast to situations of two
cooperatives studied in Idukki in Kerala and
Visakhapatnam in Andhra Pradesh.

In the northern States of Rajasthan, Madhya
.Pradesh and Uttar Pradesh, the situation was
slightly different in so far as 'elected boards at the
primary as well as union levels in our north Indian
sample were neither interested nor able to govern'
(p. 242). The controls regarding business activi-
ties, which related mostly to distribution of reg-
ulated commodities, and authority for the
decision-making processes rested with federal
organisations managed by bureaucrats who took
their orders from concerned government depart-
ments resulting in under-governance, malgover-
nance and forfeiture of rights of functionaries at
the village level. Local culture and ethos, lined
with political affiliations, reduced the operating
system to low patronage responsiveness (p. 242).

The scene in cooperatives studied in five dis-
tricts of Gujarat was totally different and in sharp
contrast to situation in southern and northern
states. The enabling factors responsible for strong
cooperative growth in Gujarat were, long and
uninterrupted tradition of member governance, a
benign micro-environment, an enlightened
macro-policy environment, high patronage and
centrality potentials for cooperatives at the pri-
mary and district levels, and regional culture
favourable to individual and organisational
entrepreneurship.

Even in Gujarat, the scenario was different from
district to district. In Kheda and Surat, the Anand
Pattern pervaded all through, with Surat doing an
inch better, Rajkot, Baroda and Sabarkantha
lagging behind, but on the way to a healthy
cooperative growth. The study concedes the fact
that most of the inferences were drawn on the
basis of a limited sample and 'a favourable one at
that', and the situation would not be uniform all
over even in the highly rated and cooperatively
developed Surat district.

One additional focal point that emerges out of
the study, undertaken under Tushaar Shah's
leadership, is the fact that the impetus to coop-
erative development was provided by the initia-
tive taken by dairy cooperatives, ably supported
by their federations, in marketing the small
producers' milk in the distant markets and on the
most favourable terms, thereby eliminating the
role of intermediate traders and organised agen-
cies in the dairy sector. Marketing emerges as the
key issue in a dairy cooperative's success in
serving its members when it comes to organisa-
tion of small producers and their linkage to distant
markets. Other things follow as the farmer
members strengthen their patronage and in return
attain vastly improved socio-economic status in
the rural community.

Member-Cooperative Interaction

Making farmers' cooperatives work is an
arduous task involving an on-going member-
cooperative interaction based on identified
member needs and aspirations. In most cases,
everybody except the members, seem to be talk-
ing about the cooperatives, taking decisions about
their future and ordering them about to do what
the planners and the so called guardian angels
want them to do. Member apathy and indifference
to their felt needs by others can be avoided only
through an integrated approach through which the
cooperative strives to serve not only the producer
member, but also the total farm household. It
would not be out of place here to give a few
examples from some countries about the per-
formance of agricultural cooperatives.

The strongest and highly integrated agricultural
cooperatives in Asia are found in Japan where
farm household is the focal point of attention by
agricultural cooperatives. Primary cooperatives
and their federations jointly plan and execute
programmes for development of the farm
households. Detailed surveys are conducted to
determine the availability of farmland, irrigation
potential, soil conditions, manpower according to
age groups, farm machineries used and the tra-
ditional commodities grown. On the basis of the
surveys, regional development plans are made for
each region and also for each of the cooperatives.
Key commodities are then determined for each
area and production plans are formulated

accordingly. The most important aspect of this planning is that a separate plan is prepared for each household after taking into consideration available land area, manpower in the family, their ages, their educational needs, social obligations such as weddings and the average annual expenditure.

Another unique feature of this planning is that the farm guidance advisers of the cooperative help fix an 'income target' for each farm household, prepare its mix-farming plan with rice and other commodities and ensure that the household secures the targeted income at the end of the year. As this income target is prepared on the basis of crop yields secured on the experimental farms, the chances are that the income target is usually exceeded unless, of course, a natural calamity reduces the production. In such a situation, a comprehensive insurance mechanism has been developed to compensate the farmer for the losses incurred.

For ensuring implementation of their plans, the cooperatives then prepare production plans which include organisation of resources and inputs, farm guidance for better productivity and infra-structural facilities for processing packaging and marketing. The cooperatives also help in planning utilisation of income, savings and investments by farm households.

In South Korea, the agricultural cooperatives were started and nourished by a strong Federation supported by government. During the initial years, the support was extended to primaries through its branches. Gradually, the Federation abandoned its unitary approach and facilitated the development of strong primary agricultural cooperatives. Also, the process of nominating presidents was done away with and elections were introduced. Today, these cooperatives are in a strong financial position and have elaborate infra-structural facilities to serve the farm households. Policy support by the Federation and the Government combined with banking and insurance services have helped the cooperatives to develop their services to members in a comprehensive way. A unique feature of cooperative credit activities is the Mutual Credit Scheme through which local savings are promoted, pooled into a national fund and made available to the deficient areas which face a resource crunch.

In Australia and North American countries, the

cooperatives extend a strong support for processing and marketing their members' produce through a network of infra-structural and market intelligence facilities. Because of the continuous support and services provided by the cooperatives, patronage cohesiveness is all-pervading.

In most of the developing countries of the world, particularly in the Asian countries, one witnesses many good examples of cooperative successes, but nowhere is the situation so complicated as in India, due to our unique system of State Partnership, overwhelming bureaucratic presence in cooperative management and the high-handed manner in which state governments formulate cooperative legislation and order cooperatives about to the total disrespect of the members to which these cooperatives belong.

Quite a few cooperatives the world over have gone out of the cooperative movement and registered themselves as joint-stock companies. This may continue to happen in future also. After all, in a voluntary movement, no one can be compelled to remain in cooperative fold if he does not have full faith in cooperative values and respect for Cooperative Principles. One of my sector colleagues in the ICA, Mr. P.E. Weeraman once remarked: 'Every good thing need not be a cooperative, but every cooperative should be good'.

Making Farmers' Cooperatives Work is an outsider's attempt to interpret agricultural cooperatives to academicians and (to Martians, if I may say so) and Dr. Tushaar Shah has done a commendable job in producing this book.

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Engineer, Asghar Ali, *Communalism in India, A Historical and Empirical Study*, Vikas Publishing House, New Delhi, 1995; Pp. xxi+319.

Communalism has dominated Indian politics for the whole of the twentieth century. It has perhaps been much more virulent in the last decades than it was at the beginning of the century. Asghar Ali Engineer is entirely right in emphasising that this phenomenon must be studied by following history. For, while natural phenomena are here-and-now phenomena, not

dependent on what happened in the past, social phenomena are a product of history. A historical study of such a phenomenon is therefore inescapable. But all such studies are for benefit in the present and, therefore, we must also relate these studies to what is happening here-and-now and what the future portends. That raises the question as to what aspect of communalism is more worthy of being studied, for communalism has two aspects. One is the two-nation theory - the Hindus forming one nation and the Muslims another nation or *qaum* or *umma* or whatsoever. The other aspect is the communal riots. At the level of top-leadership nobody justifies the riots. At that level, it is the discourse about nationalism and the perception of Indian history as a conflict and irreconcilability between the Muslim and Hindu civilizations, that constitute communalism. It is these discourses that prepare the ground for the cropping up of communalism. These discourses must, therefore, receive our greatest attention.

Engineer's study contains an excellent narration of the pre-Independence history. Some basic facts stand well-established by his narration, viz., (i) that the communal identities and resulting schisms were the product of some British policies and the evolution towards a capitalist democratic regime, (ii) that the ensuing communal conflict was not one between two religions or civilizations but one between the material interests of the elites of the two communities, and (iii) that the whole Muslim community cannot be blamed for the separatist, intolerant and exclusionist attitudes shown by some of its leaders.

Hindu communalists always paint a contrary picture, and the unwary and not-so-knowledgeable Hindu is easily persuaded to believe what his co-religionist tells him. It is therefore necessary to tell and re-tell the average Indian citizen that the medieval period was not a period of *religious* conflicts but of the conflicts between rulers and aspirants to power; that in those conflicts, Hindu rulers fought against Hindu rulers, Muslim against Muslim, and Hindu plus Muslim against Hindu plus Muslim; that if Aurangzeb destroyed some temples he also gave land-grants to some others; that correspondingly, there were Buddhist rulers who desecrated Hindu temples and idols as there were Maratha rulers who looted Hindu temples situated in enemy territory; that alongside these conflicts, saints and

scholars propagated that there was a lot in common between Hinduism and Islam; and that during the British period the conflict was always over jobs or political power.

Engineer observes that the use of religion during the freedom struggle was inescapable and necessary. It is worth quoting him in detail: 'Modern terminologies like "secularism" and "nationalism" did not appeal to Indian masses. ... Hence those who were in touch with the masses, like the *Ulama* or persons like Tilak ... had to invoke religion for mobilisation of Indian masses against the British. ... It was, so to say, a contextual need. ... But ... this .... did not much communalize our polity as (did) the conflict of interests between the elites of both the communities ...' (p. xiv). Engineer points out that such use of religion by the *Ulama* did not lead to communalism inasmuch as the *Ulama* exhorted the Muslim masses to support the Indian National Congress in its freedom struggle, and many Muslim leaders were staunch nationalists, e.g., Maulana Madani, Maulana Azad, Hakim Ajmal Khan, Dr. Ansari, Gaffar Khan and Dr. Khan Sahib, the last named even paying his respects to the *shrine* of Mother India opened in Banaras in 1936 (Pp. 65-70).

So far, so good. But Engineer does not examine critically the rise of communalism among the Hindus or the struggle which the Hindus themselves are waging against it. His efforts seem to be limited to the defence of the Muslim community against misrepresentation. When he comes to the post-Independence era, he deals more with communal riots, with the growth in the influence of Jana Sangh/ Bharatiya Janata Party (BJP), with the birth and growth of Vishwa Hindu Parishad (VHP), Bajrang Dal and Shiv Sena and with the alienation of the Muslim masses from the Congress. His narration creates an impression that no one from the Hindu side fought against communalism. According to him, 'ruling political parties both at the centre as well as at the state level encourage communal as well as casteist tendencies in order to ensure maximum number of votes. One can cite the example of election in Jammu and Kashmir in 1983. In order to capture few more seats for her party in the valley, Mrs. Indira Gandhi made speeches which clearly smacked of communalism' (p. 116). ... 'Thus the ruling classes as a whole are responsible for encouraging caste and communal identities for political ends, thereby aggravating communal

conflict' (p. 123). Engineer also refers to other acts of omission and commission on the part of Indira Gandhi and Rajiv Gandhi which, in his view, were in the nature of abetting or conniving at certain communal activities (p. xix). As regards the demolition of Babri Masjid, Engineer says: 'one can hardly exonerate the Central Government, specially the Prime Minister Narasimha Rao and the Home Minister S.B. Chavan. They *knew* that the Kalyan Singh Government of U.P. (Uttar Pradesh) will not like to stop Kar Sevaks in Ayodhya from demolishing the mosque' (emphasis added) (p. 144). Thus in Engineer's view, there was nobody who could roll back Hindu communalism, which then ran its full course because of, what one may call, existentialist causes - power struggle among the elite coupled with unemployment among the youth, economic insecurity caused by capitalistic development and local irritants. After thus dealing with the problem of communal riots, Engineer completes his book with one chapter on 'Impact of Communal Riots on Women' and another on 'Communalism and Industrial Workers'.

Engineer's perception about the post-Independences communalism conforms to the conventional wisdom, but leads to a fatalistic acceptance of communalism as an unbeatable phenomenon. There is therefore a need to go deeper. The starting point should be the legitimate place of religion in today's society. Engineer has already conceded the legitimacy of the use of religion in pre-Independence days. If it was legitimate then, there is no reason why it should not be so now. Engineer himself heads an institution called 'institute of Islamic Studies'. There are similar Hindu institutes at work. All this is a continuation of the context which we accepted in the pre-Independence days. It is was legitimate then, it is legitimate now. So long as that context is used constructively for reforming individuals and improving social relations, such use cannot be equated with communalism or fundamentalism. The recent judgement of the Supreme Court in the election case against Manohar Joshi, Chief Minister of Maharashtra, reflects this fine balance.

There is no doubt that fundamentalist and communal forces are still strong among Hindus as well as Muslims. In dealing with them, political parties have to maintain the fine balance noted above. Governments have, in addition, to take care that their actions would be legally and constitutionally tenable in a court of law. One cannot use absolute standards to judge their actions. Post-1986 developments in India need to be re-examined in this light. During the last ten years, political parties and governments have at times appeared to be soft on communalism but it has to be noted, which Engineer has not done, that strong actions have also been taken against it. In the 1991 elections V.P. Singh, even while having an electoral alliance with the BJP, refused to share a common platform for election propaganda. Laloo Prasad Yadav and Mulayam Singh took strong action against the *Rathayatra* and *Kar-seva*. Narasimha Rao immediately on coming to power in 1991 got enacted the Places of Worship (Special Provisions) Act, 1991 which laid down that with the exception of *Ramajanmabhumi-Babri Masjid*, the religious character of all places of worship would continue to remain the same as it existed on August 15, 1947. This enactment froze the status of more than 3,000 places of worship, including the important ones at Mathura and Kashi, which the Vishwa Hindu Parishad wanted to be converted into their allegedly original form of Hindu temples. Narasimha Rao dismissed the state government directly or indirectly responsible for the demolition of the *Babri Masjid*. He also acquired for the central government the land in dispute there and referred the dispute to the Supreme Court, which led the dispute being relegated to the judicial process rather than street action. The Supreme Court and the Election Commission made clear the limits beyond which the use of religion for election propaganda would be punishable. The latest in the battle against communalism is that after the 1996 election to the Lok Sabha, the BJP was effectively prevented from wielding power on the grounds that it was a communal party. Thus, the battle against communalism is on. For a complete account of that battle we need another book, a book which will update the story left half-way by Dr. Engineer.

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Maital, S., 1973; 'Public Goods and Income Distribution', *Econometrica*, Vol. XLI, May, 1973.

Chakravarty, S. 1987; *Development Planning: The Indian Experience*, Clarendon Press, Oxford, 1987.

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4. For a critique of recent industrial policy proposals, see Marshall [Marshall, 1983, Pp. 281-98].

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