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POLITICAL ECONOMY OF IRRIGATION DEVELOPMENT IN VIDARBHA

S.J. Phansalkar

This paper traces the political economy of irrigation development, and the issues of regional imbalances created by the process of allocation of development resources based on regional power bases, rather than equity or need. Irrigation development in Maharashtra is taken as a case in point. The western parts of the state are politically and economically much more powerful while Marathwada and Vidarbha are relatively backward and powerless. The power in the state is concentrated in the hands of the Maratha lobby from the sugar belt. An active demand, a history of significant work on analysis and investigation of irrigation sites, and control on state resources made a handy combination for the progress of creation of irrigation potential in Western Maharashtra. In the thirty years of Maharashtra state, irrigation potential in Western Maharashtra crossed 50 per cent of the net sown area (on Standard Rabi Equivalent (SRE) basis) while Vidarbha saw progress from 10.6 (per cent) to only about 23 per cent. Interestingly, Marathwada, considered to be the most backward region at the time of formation of Maharashtra state, and which started with negligible irrigation potential, had overtaken Vidarbha in the creation of irrigation potential during this time. The Fact Finding Committee [Dandekar, 1984] brought the regional inequity out in the open, and suggested ways of addressing the problem. Nothing much had been done for over fifteen years to correct the situation. This was obvious when a re-look at the regional development issues by the Committee on Indicators and Backlog [Government of Maharashtra (GOM), 1997] confirmed in 1997 that the Vidarbha region had been given a short shrift in irrigation development, resulting in huge backlog, most of it in Amaravati Division of Vidarbha. Even now the ground situation has not changed at all. The powerful Western Maharashtra lobby adopts a series of skilful and insensitive machinations to ensure that development resources are used for their region. While socio-cultural proximity, alert leadership, and consistent and insistent follow- up has seen that Marathwada region caught up in the race, problems of Vidarbha persist and show no sign of nearing any satisfactory conclusion. Confabulations, tantrums and vituperations accompany frequently rising bubbles of the Vidarbha activism. These are more often than not neutered merely by politically accommodating the vocal leaders. What is clearly evident is the inability or unwillingness of the political leadership from Vidarbha to consistently follow up and navigate irrigation projects of the region through the crafty machinations of the wily bureaucratic machinery, ably supported by their political bosses from Western Maharashtra. This has meant that while a lot of steam rises every once in a while on the backlog of development, no progress occurs on the ground. Clearly, the weak and the guileless must satisfy themselves with such crumbs as the powerful and the wily allow to fall from their table.

I. INTRODUCTION

Vidarbha comprises (now) the eleven eastern districts of Maharashtra. As per the 1991 Census, over 1.7 crore people live in some 13,300 villages and nearly 100 small and big towns in Vidarbha, covering a total of 94,400 sq km, at a population density of 184 persons per sq km. Thirty four percent of these people belong to the Scheduled Castes and Scheduled Tribes (SC/ST). While a large majority of the people speak Marathi or its dialects as their mother tongue, there is a strong influence of Hindi in all public fora. A strong sense of being discriminated against is perpetuated among the people of Vidarbha. Its origin perhaps lies in the fact that the city of Nagpur, which is the hub of all events in Vidarbha, and hence the elite living in it suffered a major diminution in importance in the country following creation of linguistic states. It was the capital

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of the Central Provinces and Berar till 1956, and hence enjoyed a considerable say in public matters. The decision-making hub shifted to Mumbai in 1956. The Vidarbha elites have now to compete for power with the more resourceful elite from Western Maharashtra. While largely an issue with the political elite, yet this sense of having been, and still being, wronged is significantly reinforced by the fact of relatively lower development of this region vis-'-vis other areas in Maharashtra. For instance, the Centre for Monitoring Indian Economy (CMIE) development indexes,[1] shown below, indicate significantly lower level of development of the Vidarbha area.

Levels of Development in Different Districts of Vidarbha

Serial Number	District	Relative Index of Development, as per CMIE
1	Akola	65
2	Amravati	74
3	Bhandara	73
4	Buldana	59
5	Chandrapur	72
6	Gadchiroli	64
7	Nagpur	109
8	Wardha	99
9	Yavatmal	64
	Maharashtra	164

Source: *Profiles of Districts*, October 1993, CMIE, Mumbai, various pages.

The subject of Vidarbha being given a stepmotherly treatment by Maharashtra Government has a way of coming to centre stage at frequent intervals. It goes out of the limelight as mysteriously as it comes in prominence, but never does it completely die.

This paper examines whether and how the irrigation development in Vidarbha has been affected by these broader currents and developments, connected with the regional disparities in Maharashtra. More importantly, it attempts to reconstruct the way in which the politics of development creates and recreates patterns of behaviour that essentially result in sharing the spoils of development to suit those, who have real political power. The paper ends somewhat despondently for Vidarbha, yet attempts to sketch out a course of action for the civil society to protect the vital interests of the people even after granting the fact of continued tilt in the way of the Maharashtra government.

II. REGIONAL DISPARITIES AND THEIR REDRESSAL MECHANISM IN INDIA

The issue of regional disparities has been at the forefront in many Indian states for decades. The following table illustrates the recently articulated issue of regional equity and disparities in various states of the country.

At the political level, the question often takes the shape of popular mobilisation for formation of a separate state for the people claiming that they suffer from discrimination and injustice. Diverse grounds for mobilisation and justification for the demand for a separate state are seen in India. They are about language (case of Maharashtra and Gujarat in the then Bombay state), ethnicity (cases of Jharkhand, and Gorkhaland), historicity (Telangana, Vidarbha, and Chattisgarh), culture and religion (case of Jammu), etc. However, the perception that economic development is occurring at different pace in the same state and that the impugned region is systematically 'exploited' or 'neglected' is the basic source that feeds the separatist movements [GOI, 1999]. Thus, economic disparities have tended to lead to separatist movements in the country. Article 371 of the Constitution of India provides for redressing these problems within the framework of the established states of the Union. Under the Article, statutory development boards can be created for the impugned regions, and the provision of adequate funds, and monitoring their progress are directly under the charge of the governor of the state. Further, a governor can give directions to the state government to take appropriate action to redress the disparities and to take steps for a balanced regional development.

Regional Disparities in Various States

State	Region of the State Claiming Neglect	Current Status
Uttar Pradesh	Uttaranchal, Eastern UP and Bundelkhand	Uttaranchal, now separate, disparities persist for the other two.
Bihar	Chhota Nagpur and Santhal Pargana	Formed into a new state, Jharkhand
West Bengal	Gorkhaland	Separate development board established
Madhya Pradesh	Chhattisgarh, Bundelkhand	Chhattisgarh, now a separate state, disparities persist in Bundelkhand
Maharashtra	Vidarbha, Marathwada	Development boards formed.
Andhra Pradesh	Telangana	Disparities persist
Karnataka	Hyderabad Karnataka areas	Development board formed
Jammu and Kashmir	Jammu	Disparities claimed to persist
Gujarat	Saurashtra and Kuchch	Disparities claimed
Orissa	Western Orissa	Disparities persist

Source: Compiled by the author on the basis of various newspaper reports.

Spatial (Regional) Equity

Andre Gunder Frank [1975] and Samir Amin [2002] have led the neo-Marxian school that has addressed the question of regional economic disparities across countries in the world. Later, the core of these ideas, that terms of trade move against the primary products 'produced in the periphery', and hence, producers in the periphery must be protected through tariffs, came to be known as the Prebisch-Singer Thesis [Prebisch, 1962; Singer, 1950, Pp. 473-85]. The basic contention of Frank is that development occurs only along with underdevelopment. Popular terminology 'development metropole and periphery' or just pole-periphery has come into vogue from the writings of Frank and his followers. The essential argument consists of the following components:

* Capitalism knows no regional or national boundaries.
* Economic transactions between capitalist actors in different regions over a long period result in transfer of economic value, and hence, that of prosperity from one region to another.

* Tacit or explicit alliances between capitalists of different, even opposing, regions tend to be formed to protect the vested interests of the capitalist class. And
* the capitalist class as such manipulates diverse instruments of the state to suit their interests in the above process of development and underdevelopment.

While the labour class in the metropole is exploited in terms of class conflict between the capitalist and workers, the general populace in the periphery is exploited by the combine of the capitalists in the periphery with the capitalist in the pole. Whether the labour class in the pole is theoretically opposed to the exploitation of the workers in the periphery or not, their interests surely clash, and the practical steps taken by the respective groups may vary across time and space. For instance, the American software workers oppose any 'outsourcing' of work that may that may reduce their job opportunities.

Non-ideological explanations of the issue of spatial equity recognise the basic pattern of capitalist underdevelopment, but make the explana-

tions less emotive. They tend to locate the causes in social formation, resource endowments, and the historicity of trade and communications network. In such a formulation, spatial equity or its absence is seen to arise out of a complex combination of factors:

* resource endowment: regions with better natural endowments tend to move ahead economically.
* nature of population living in different regions: some communities are more entrepreneurial. Others are more 'laid back'.
* network of transport and trade,
* historicity of investments by private or public players in different lines of industry; some regions may become suppliers of raw materials and consumers of end products while the manufacturing and value addition occurs elsewhere.
* nature of polity and its responsiveness to regional aspirations: the decision to invest in infrastructure and in facilities to develop the regions are after all taken politically. See below for the specific case of Maharashtra.
* policy about positive discrimination for favouring 'backward' regions: this has been in vogue in India since the eighties, and takes the form of write backs [that is taxes paid by the concerned industrial unit are either refunded or adjusted against taxes to be levied for units of the same companies elsewhere] and deferment of state levies for units situated in the backward regions.
* price equalisation policies: prices of essential inputs such as fuel, electricity, minerals, etc., may be designed to be equal every where depriving the producing regions of the advantage of proximity to production centres. And
* direct and indirect attempts to achieve balanced regional development: these may take the form of special boards, etc.

It is possible to argue that when an already entrepreneurial community lives in a resource rich region, it tends to make good use thereof, and the community prospers. Due to forward and backward linkages and, in particular, due to the massive need for services created by the entrepreneurial activity of the leading community, the region as such prospers. But such a statement can also be naive ascription of faster regional development of a region to the drive of the community there. Regional domination may also be perpetuated by deploying the instruments of the state for the continued hegemony of the established elite. This may be done through use of instruments of taxation, differential investment in infrastructure, and pricing of publicly produced services and goods, and more subtly, by manipulating the administrative machinery of the state to suit the interest of a specific region.[2] In this sense, the neo-Marxian school has a significant insight into the phenomenon.

III. POLICY ATTENTION TO REGIONAL EQUITY ISSUES IN INDIA

In India, the initial policy concern was more with poverty eradication alone through boosting income of the people, rather than on achieving balanced regional development. Later, when not only homogeneous, regionally undifferentiated poverty but also existence of areas of rising economic well-being accompanied by stagnating economic zones became matters of concern, the policy attention shifted to regional equity issues. The following summary of systematic analysis of regional equity questions is taken from Jairam Ramesh [August 5, 2005].

In 1967, the Planning Commission undertook an elaborate exercise, which was published in the form of a report called *Regional Variations in Social Development and Levels of Living -- A Study of the Impact of Plan Programmes* [GOI, 1967]. This report analysed the extent of inter-state and inter-regional variations in consumption, unemployment, land holding, rural investment and debt, agricultural development,

educational and health facilities, and roads. This exercise was essentially a factual survey, and restricted itself to measuring the extent of variation in development among states.

The first systematic attempt at identifying and classifying backward areas at a level lower than that of a state was that of the Sukhamoy Chakravarty Committee on Backward Areas [GOI, 1974]. The following variables were chosen to express relative variations in development:

* Density of population.
* Percentage of agricultural workers to total work force.
* Gross value of food grain output per head of rural population.
* Gross value of output of all crops per head of rural population.
* Percentage of total establishments using electricity to total number of establishments.
* Percentage of household establishments using electricity to total household establishments.
* Percentage of non-household establishments using electricity to total non-household establishments.
* Number of workers in registered factories per lakh of population.
* Length of surfaced roads per 100 sq km of area.
* Length of surfaced roads per lakh of population.
* Percentage of male literate to male population.
* Percentage of female literates to female population. And
* percentage of total literates to total population.

Using different statistical techniques, the Chakravarty Committee [1974] combined these variables into a single index of regional disparities in levels of development, and identified 179 districts as, what it called, the 'hard core' of backward areas in the country. As compared to these 179 'hard core' backward areas, special programmes were in place commencing in the Fourth Plan in 298 districts under schemes relating to DPAP, (Drought Prone Areas Programme) Hill Areas, Tribal Areas, Investment Subsidy, and Concessional Finance. The distribution of the 179 backward districts was described in terms of:

* 102 districts in the central part of India extending from the northern districts of Andhra Pradesh (AP) through a large part of Madhya Pradesh (MP), Orissa, some eastern and northern districts of West Bengal, most of Bihar, and eastern Uttar Pradesh (UP), and extending partly into some central and western UP districts.
* 23 districts in the Himalayan foothill belt including districts in Jammu and Kashmir (J&K), Himachal Pradesh (HP) and the hill districts of UP.
* 22 districts in the Rajasthan-Gujarat belt,
* 25 districts in the north-east region, and
* seven isolated backward pockets in Gujarat, AP, Maharashtra, Tamil Nadu, Dadra and Nagar Haveli, Andaman and Nicobar Islands, and Lakshadweep,

These backward districts were further classified into broad aerial groups with relatively homogeneous structural patterns.

* High population density areas with moderate resource endowments, inefficiently exploited.
* Low to medium population density areas with slow growth and poor enough to moderate resource endowments.
* Low population density, large tribal population, resource-rich but substantially undeveloped areas.
* Peripheral location, low population density, large tribal population, resource-rich but substantially undeveloped areas. And
* ecologically unbalanced areas with special physical problems.

The Chakravarty Committee [1974] made a large number of recommendations on development approaches to be adopted for these five categories of backward areas. The Committee also made suggestions for improving planning methodology for backward area development. It commended the sub-plan methodology of planning, and resource allocation as a model for ensuring a certain order of investments going into specified backward areas, by earmarking of funds from state plan resources, supplemented by special central assistance. Finally, the Committee noted that if resource transfers were needed to finance the plans of backward regions on a requisite scale, suitable measures would have to be adopted. Some of these could be central funding for special programmes, special incentives to promote private investment, larger allocation of funds by state governments, raising of resources, (e.g., in the form of labour) from within the backward regions, etc.

The National Committee on the Development of Backward Areas (NCDBA) [1980] rejected the index-based approach adopted by the Chakravarty Committee [1974], to identify backward districts. Instead, it identified 'problem areas', which could not realise their development potential, unless special measures were to be taken to alleviate certain crucial constraints. The NCDBA recommended that the following type of problem areas be treated as backward for purposes of planning:

* Chronically drought-prone areas and also desert areas.
* Tribal areas.
* Hill areas.
* Chronically flood-affected areas. And
* coastal areas affected by salinity.

The focus of both, the Chakravarty Committee [1974] and the NCDBA, appears to be on the industrial development of the backward area, defined in terms of district, or in terms of an underlying problem, or constraint to growth. The NCDBA dealt extensively on the industrial development of backward areas, and highlighted the concept of growth centres as a catalyst for backward area development. It identified five major types of development, which could create such growth centres with substantial potential for generating all-round development in backward areas - industrial complexes, growing urban complexes, raw material exploitation, large irrigation projects, and hydel and thermal projects. Finally, the NCDBA too commended the project-oriented sub-plan approach, as part of both the state-and-central plans, on the pattern of the *Integrated Tribal Development Project* for the total development of backward areas.

IV. BACKGROUND OF VIDARBHA

Historical Backdrop

Vidarbha itself comprises two categories of districts. The Varhad (or its anglicised name, Berar) districts - Amravati, Akola, Buldhana and Yavatmal - were originally territories of the Nyzam of Hyderabad. The Nyzam had agreed to host the army of the East India Company in a pact in the late 1820s. He had also agreed in a truce with the Bhonsalas of Nagpur for a revenue sharing arrangement with the Bhonsalas for the Varhad districts. Under this, the Bhonsala king collected revenue and gave some 40 per cent to Nyzam. At times both the parties collected revenue and chaos would ensue, causing great hardship to the peasantry. When the Nyzam found it difficult to make payments for the maintenance of the army to the Company, in 1853 he leased the Varhad districts to the Company for a certain annual lease fee. The Company, being militarily much stronger than the Bhonsalas, stopped the

sharing arrangement altogether, and strengthened the collection mechanism in Varhad, instituting *rayatwari* in preference to the Permanent Settlement pattern of Bengal or UP or the *Malguzari* pattern of the Bhonsalas. The other four districts, Nagpur, Bhandara, Chandrapur, and Wardha were a part of the kingdom of the Bhonsalas. Angry at the Company for having stopped the revenue share of Varhad, the Bhonsalas supported the First War of Independence. The brave warriors lost. After the fall of the Sitabuldi Fort in 1857, the Bhonsalas were deposed. Subsequent severe and cruel acts (freedom fighters were hanged, one each on almost every tree on the road from Nagpur to Hoshangabad, so goes a legend) of vengeance by the forces loyal to the British throne more or less completely decimated all sections capable of wielding arms. A Resident was appointed and ruled from Nagpur after the Queen's Decree of 1858. The Resident ruled over the province called Central Provinces (CP). This included the territories of all the kings and chieftains who supported the First War of Independence in 1857, from Nagpur to Jhansi. In effect, it included all the districts of current MP and Chattisgarh, except those that formed the territories of the kings who had betrayed the Indian liberation struggle. Circa 1897, Varhad was annexed to the British dominions from the Nyzam in a settlement of the dues, which the Nyzam was unable to clear. A certain agreement was signed that allowed for continued, though token, recognition of the Nyzam's rights over the region [Kolarkar and Purandare, 1997, Pp. 179-211, original Marathi]. Varhad was added to CP and was subsequently clubbed with Nagvidarbha districts by every one. Vidarbha remained a part of the CP and Berar province till Independence and later till 1956. At the formation of the Greater Bombay state, Vidarbha was included in Bombay and became a part of Maharashtra from 1960.

Social Formation

Population of Vidarbha can be classified in four major categories. The first is the category of aboriginals: *gonds, kolams, pradans, korkus,* etc. The first three live in Wardha, Nagpur, Bhandara, Yavatmal, Gadchiroli and Chandrapur districts. *Korkus* live in the northern villages in Amaravati, Akola and Buldhana districts. The *kolams* are 'primitive tribal groups', as per a recent Government of India (GOI) classification. To this category one may add nomads like the *pardhis* of Central India. The second and quite a sizeable category is of the Scheduled Castes (SCs), notably the *mahar* community that has significant presence in Nagpur, Chandrapur and Wardha districts. The third category is the stock of middle and high caste Marathi speaking people. In Vidarbha, dominant castes are *kunbi,* and *teli. Kunbi* which is roughly equivalent to the *patels* of Gujarat is the main caste of land tillers and numerically strongest in West Vidarbha, having now more or less become the ruling caste of the region. *Telis* are found more in the eastern districts and are dominant there. A third caste, strong in terms of its financial muscle but numerically weak, is that of the *komtis,* a community that has settled in the eastern fringe of the Deccan plateau extending well into AP and Chhattisgarh. As expected, the vocal *Brahmin* community is largely confined to urban centres, is seen to be strongly affiliated to the Rashtriya Swayamsevak Sangh (RSS), and has lost all political power, though it provides a certain kind of leadership through its domination of the professions. The fourth category is of relatively recent in-migrants from other parts of the country: Rajasthan, Gujarat, MP, and Chhattisgarh. There is a very strong presence of *marwari* community; both *maheswari* and *agrawal* groups. There is a significant presence of Gujarati community, mostly *patels* in the *tendu* leaf areas of the east and *banias* elsewhere. And there is a substantial presence of

jaiswal community, the Central and East Indian equivalent of Tamil Nadu's *Nadars*. Finally, there is a noteworthy, if dwindling, presence of the high-nosed Hindi speaking *Brahmin* community that dominated the Vidarbha region during the CP and Berar days right up to the regime of Shuklas and Mishras (from say 1945 to 1956). These communities have settled in Vidarbha in the last one hundred and fifty years. Occupational patterns tend to vary with community. The tribals are mostly dwellers of villages in and proximate to forests, living partially on fairly inefficient farming and partially on the forest resources. Hence, we find more of them in the districts of Yavatmal, Wardha, and the tribal belt of Nagpur, Bhandara-Gondia-Gadchiroli. The *telis* and *kunbis* are mainly farmers. People of the SC living in rural areas tend to be wage earners while those in the urban areas have mixed occupations: government employment, small businesses and domestic service. *Brahmins* tend to dominate the professions. *Marwaris* in Vidarbha have been the archetypal money lender-cum-traders and have near complete stranglehold on the regional economy, a grip that is shared with the *komtis* in eastern parts of the state. The *marwari* domination on business and economy is so complete that they perhaps own over three-fourths of all wholesale trading establishments and registered industries. Three of the four leading newspapers in Vidarbha are owned and run by the *marwari* community, and they, incidentally, have been strong supporters of the movement for a separate Vidarbha (The *marwari* controlled newspapers are the *Hitvada*, *Navbharat*, and *Lokmat*. The RSS runs the fourth newspaper, *Tarun Bharat*).

Land Tenure in Vidarbha

Three different systems of land tenure prevailed in Vidarbha at the time of Independence. The Bhonsala regions had a system of malguzari described in the Box: .

Malguzari System of Central Provinces

A *malguzar* was allotted a number of villages from which he collected land revenue and paid it into the treasury. His status was some thing between a collection agent and a Zamindar. A *maluguzar* was allowed to retain 'two *annas* for himself'; and pay '14 *annas* to the Government'. Thus, his commission was an eighth of the land revenue. Yet he was held personally liable to pay the revenue for all the farm lands in his villages whether the farmers paid their revenue to him or not. The tough 'sun-set' rule applied, as it did in the Permanent Settlement areas. *Malguzari* rights were negotiable and transferable. *Malguzars* were petty landlords but their power over their villages was no less absolute than that of the Zamindars in Permanent Settlement areas. They had absolute right over every thing other than the specific plots of agricultural land owned by the peasants: the common lands, the residential areas of the village, the tanks, and the forests in their areas. Transfer of property by peasants needed a No Objection Certificate from the *malguzar*, and he was allowed to charge a fee for the purpose. The *malguzar* employed a revenue inspector, called *kotwal*, and with his help maintained the land records. To top it all, he was also the Arm of the Law in the village and represented the police.

In most of Varhad areas, *rayatwari* prevailed from about the time the Company took over from the Nyzam in 1853. This was the same system as obtained in Bombay and Madras Presidency areas. Positions of *deshmukhs, moharils,* and *deshpandes* were created to assist in revenue administration, and they were either given plots of land and usufruct right over village commons including the village *gadhi* (a small fortress of sort). The right to use the *gadhi* and the commons and the right of being a *deshmukh* were prestigious matters, and the *kunbi* farmers aspired for it [Kolarkar and Purandare, 1997, Pp. 212-19, original Marathi].

The third system that prevailed in a small portion of only the Yavatmal district was *ijardari*, which was akin to the *zamindari* system and settlements to the *ijardars* were permanent with dependent tenantry (*Ijardari* region also had a

significant kolam population and that was another reason that made the latter submissive, non-acquisitive and myopic).

Pre-independence Developments in Vidarbha

Varhad was considered to be an exceptionally prosperous belt in the pre-Independence days. The region has fertile deep black cotton soil ('not a pebble can be found for several miles around here' was the boast of many regions in Varhad). The establishment of first regular cotton exports trade from here from about 1860 and the completion of the rail link to Bombay gave a boost to cotton cultivation. The Empress Mills was among the very first industrial ventures of the House of Tatas and it was located in Nagpur in 1878. Gradually, the establishment of scores of cotton textile mills both in Mumbai and Ahmedabad meant that a lucrative and more or less assured market for cotton existed for the farmers. Rainfall in Varhad was in the neighbourhood of 35 inches (850 mm). But the best part was that it was highly reliable. In effect, unlike most other regions of the Deccan Plateau, Varhad did not have a single year of famine for a whole Century from 1850 to 1950. Prosperity and stability bred complacence and lethargy. Varhad also became known for its soporific, placid and laid back society that became an easy prey first to the *marwari* money lender and then to political machinations as we shall see later. Amaravati was the most important education centre in Varhad, Vidarbha Mahavidyalaya was among the oldest colleges in the whole of Central India. While Tilak found a few sympathisers and there were sporadic leaders of the Congress (Brijlal Biyani, Bapuji Aney, Ruikar to name a few), the region was politically asleep during the British rule. The Nagvidarbha region (that is, Nagpur, Wardha, and old Bhandara and Chandrapur districts) had a much more heterogeneous social composition, with tribals and *marwaris*, Hindi speaking babus of the CP and Berar government, Gujarati *beedi* industrialists, komtis and a large Bengali and Telugu population

making up the society. The RSS was established here by Dr. Hedgewar in 1923. Hindu Mahasabha also had some influence here. But, basically here too there was as a strong influence of Mahatma Gandhi and later Vinoba Bhave with Ashrams in Wardha and Paonar respectively. Kamalnayan Bajaj of Wardha and his children gave unstinted support to the Gandhian movement and are doing so till date. It seems that what little political activity there was in Vidarbha was a derivative of the national political movement and did not have much specific regional flavour (e.g., there was neither any equivalent of E.V. Ramaswamy here nor anything like the Adi-Vidarbha sub-stream of political consciousness). [For a detailed exposition of political movement and ideas in Vidarbha, see Joshi, Ed., 1980].

Formation of Maharashtra and Merger of Vidarbha in Maharashtra

At the time of Independence, the eight districts of Vidarbha (Akola, Amravati, Buldhana, Bhandara, Chandrapur, Nagpur, Wardha and Yavatmal) were a part of the Central Provinces and Berar state. Nagpur was the capital of this state. The state included vast tracts of Malwa, Nemad, Bastar, and of Chattisgarh, and Mahakoshal, all currently in either MP or in Chattisgarh state. The remaining eighteen districts of Maharashtra came from two other regions. Western Maharashtra and Konkan districts also formed a part of the bilingual Bombay state, which also included the Bombay Presidency areas of Gujarat (Ahmedabad, Surat, Valsad, Bharuch, Mehasana, Kheda, etc.) Marathwada districts came from the state of Hyderabad.

Owing to the perception of inequity meted out to the Marathi-speaking regions by the Morarji Desai Government, resentment started brewing in Maharashtra. For example, Ambedkar records [Ambedkar, Bhimrao, 1979] that between 1947

and 1955, the allocation of subjects to various ministers of the Bombay cabinet followed the pattern given below:

Gujarati speaking cabinet ministers: (Desai himself, Dinkar Desai, Jivaraj Mehta and Shantilal Shah)   a total of 202 subjects.

Marathi speaking cabinet ministers: (Hire, Chavan, Nimbalkar and Tapase)   a total of 88 subjects.

More telling, the per capita expenditure made by the Bombay Government in the first three years after Independence was as follows:

Region	Population (million)	Per Capita Development Expenditure (Rs. in Crore)		
		1951	1952	1953
Maharashtra	21.7	1.7	2.3	2.8
Gujarat	11.9	2.9	3.1	3.2

The per capita expenditure in Gujarat regions was higher by between fifteen sixty percent. This kind of step-motherly treatment to Maharashtra naturally flared passions and anger against the Desai Government [Ambedkar, 1979, quoted in Bhongle, 1998, p. 65, original Marathi].

State Reorganisation

The deep rooted resentment against the domination by the Gujarati speaking rulers on one hand, and the aspiration of bringing all Marathi speaking people in one political unit on the other, took the form of demand for a separate state for Marathi speaking people. The hitch was, though dominantly a Marathi speaking area, Vidarbha was not a part of the larger Maharashtra region at all, until 1956. This naturally weakened the argument of those who wanted a separate state for Marathi speaking people. To make matters worse, numerous previous Committees and Commissions had recommended forming a separate state for the Marathi speaking Vidarbha region! For example, Gedam [2002, Pp. 46-55, original Marathi] writes, 'In 1888, owing to recurrent and at times intense complaints of neglect made from Marathi speaking regions of CP and Berar, it was actively debated whether to merge the Vidarbha districts into the dominantly Marathi districts of Bombay state. The Commissioner then clearly stated that the eight districts were large enough to form a viable and compact state by themselves.' Later in 1938, the CP and Berar State Assembly unanimously adopted a resolution that 'urged His Majesty's Government to form a separate province out of the eight districts of Vidarbha'. He further states, 'the well-known social anthropologist Iravati Karve had mentioned in her volume, *Culture of the Marathi People,* that the districts of Vidarbha and those of Maharashtra never formed a consolidated political unit'. After the Congress Party itself appointed a committee to consider the issue of linguistic reorganisation of provinces, the Commission clearly mentioned that administrative convenience and continuity with past conventions are as important a consideration for forming a state as the shared language. In 1947, leading personalities in Maharashtra, including DR Gadgil, Kannamwar (who later became Chief Minister), Shriman Narayan Agrawal, etc., signed a pact known as the Akola Pact. It recommended that there should be two Marathi-speaking states: one to include the districts in West Maharashtra and the other to include the Vidarbha districts, and that there should be separate legislatures and ministries in the two regions. To cap it all, the State Reorganisation Commission recommended that Vidarbha as a compact administrative unit become a state itself.

In Vidarbha itself, there were two schools of thought. The dominant school preferred to remain as a separate state. This was supported by most of the well-known leaders of the region: Biyani, Bajaj, Kannamwar, Aney, and so on. The other, mostly led by cultural revisionists wished to join Maharashtra, since they believed that language as well as culture had established organic links between these two regions and, therefore, they must unite.

Nagpur Pact of 1953

1. In the light of the current thinking of linguistic reorganisation in the country, we unanimously resolve to strengthen the case of a separate state for Marathi speaking people by agreeing as below:

2. Maharashtra will be formed by consolidating all the Marathi speaking and contiguous districts and regions in the current MP, Bombay, and Hyderabad states into one administrative unit. The state will be named as Maharashtra or the state of Marathi Speaking People and its capital will be in Mumbai.

3. This state shall include Mahavidarbha, Marathwada, and the rest of Maharashtra and will strive for comprehensive development of all the regions.

4. Without infringing upon the need for maintaining a balanced government, development expenditure in the three regions shall be equitable and in proportion to the population, but for some time to come, special attention will be paid to the Marathwada region, considering its backwardness.

5. Each region will receive adequate representation in each elected government to be installed in future.

6. Efforts will be made to ensure that admissions to technical and professional institutions, and institutions of specialised higher learning will be made giving due attention to the population of the three regions.

7. The High Court for the state will be situated in Mumbai with a Division Bench in Nagpur. Adequate representation to the Bars in various regions and in particular, Nagpur, will be given while appointing judges, without diluting the merit requirement for the exalted positions.

8. Recruitment to state cadres and to the state-supported agencies will be done keeping in mind the need to give due representation commensurate with the population of the three regions.

9. We believe that greater amity and cooperation between administrative units of the three regions can be achieved by effective decentralisation.

10. We recognise that the people of Mahavidarbha have great attachment to Nagpur that has been the capital of CP and Berar for a long time, and that they do derive several benefits from this status of the city. Attempts will be made to ensure that these benefits continue within the limitations of ordinary financial prudence. All offices of the state will be moved to Nagpur for a definite period each year, and at least one session of the Assembly will be held at Nagpur each year.

11. Treating village as a unit and using the latest Census, districts will be so re-organised as to ensure that the entire contiguous Marathi speaking regions are included in the state'.

Be it as it may. The demand for a separate Vidarbha state naturally weakened the movement for Samyukta Maharashtra (Consolidated Maharashtra). Desai, who seriously opposed the break-up of Bombay state, fully exploited this position. Hence, it became important for the then leaders of Maharashtra to come to Nagpur and arrive at a commonly shared Memorandum of Understanding known as the Nagpur Pact. Signed in 1953 by leading exponents of the Maharashtra movement as well as leaders from Vidarbha, the Pact stated the terms as below [Gedam, 1991, Pp. 83-114, original Marathi].

Separate Vidarbha Movement: Off again! On again!

The Nagpur Pact became an instrument at the hands of the Samyukta Maharashtra movement leaders (S.M. Joshi, P.K. Atre, Y.B. Chavan, etc.)

for boosting their demand for linguistic bifurcation from the Bombay state. Desai tried to suppress the movement, often using force. (In one firing incident, police action killed as many as 105 people in Mumbai, the worst of the police record in Maharashtra for all times!). Yet, finally the movement won, and the state of Maharashtra was carved out of the Bombay state with Mumbai as its capital.

The Nagpur Pact had applied a much-needed balm on the bruised ego of the Vidarbha people. It had also raised hopes of a just and equitable rule. Recognising the need for equity, the then Chief Minister, Y.B. Chavan, said on the floor of the Assembly 'All possible steps will be taken (to) give to the Nagpur agreement legal and constitutional sanction. I wish to assure the people of Vidarbha that they need have no apprehension that their legitimate interests will not be protected. On the other hand, they will be zealously guarded,

and will be treated as the sacred trust of the future Maharashtra Government. The Terms of Nagpur Act will be honoured and wherever possible, something more will be done' [Chavan, Y.B. as quoted in Gedam, 1991, p. 90, original Marathi].

But, soon a strong perception gathered that these pious commitments would remain only on paper. The Vidarbhites (a term used to refer to supporters of separate Vidarbha state) were also only dormant, not extinct. After initial few years from the formation of Maharashtra state, and continuing throughout the last forty-three years of the history of Maharashtra state, demand for separate Vidarbha state has been raised time and again. Five Congressmen, namely, Banwarilal Purohit, Shankarao Gedam, T.G. Deshmukh, Madhukarrao Kimmatkar, and late Nasikrao Tirpude have remained strong supporters of this demand (Shankarao Gedam, 2002, personal Comm.). Prominent and respected, these leaders have never compromised for personal gains. But, they never raised mass and hysteric mobilisation in the 'separatist' movement. The demand does come to the forefront once in every while. For instance, during 1969-71, this demand was at its peak with ex-Member of Parliament, Dhote, anchoring it. The apparent immediate cause for the flare-up then was the demand for setting up a separate agricultural university. It then followed the familiar course of *bandhs* and sporadic break-down of law and order. Perhaps a few buses were burnt, and a few individuals suffered bullet injuries in police firing. The movement became dormant after the university was sanctioned. It arose again after the Dandekar Committee [Dandekar, 1984, See below for full discussion of the Committee's work] gave its report, and then again when the current Progressive Democratic Front (PDF) government had taken charge in 1999.

Soon after Bharatiya Janata Party (BJP)-Shiv Sena government had taken over in 1995, the Sena Chief Thakre pooh-poohed the demand for a separate state for Vidarbha, alleging that this was essentially an agenda by the non-Marathi (read *marwari*) people to gain ascendancy. He also assured that the new government would do everything to avoid suspicion of a step-motherly treatment. In fact, when he was in BJP, Purohit had influenced the BJP to support the demand for a separate state. The demand had also attracted at least verbal support from important leaders, like Sharad Pawar. But Sena has always been firmly opposed to the idea of splitting Maharashtra. The charge that the movement was instigated to subserve the *marwari* interest seemed to be tenable, considering that all the three *marwari* controlled newspapers were strongly supportive of the demand then. They were supportive of the next bout of Vidarbha fever in 1999 as well, when the current PDF Government had taken over. At least, three of the most vocal leaders of the movement at this time were non-Marathi, at this time, there was greater public debate on the issue. There were strong allegations in the news papers that the bogey of separate Vidarbha was raised by politicians, who could not get positions of power in the government. The fact that a senior leader who was once an MP Congress Committee (MPCC) President but was unceremoniously dropped from the cabinet had given this separatist war cry, made this charge a little credible. The case of another leader, whose fervour for Vidarbha evaporated when he was accommodated in the cabinet after the demand had reached its peak, also justified such cynicism. It was also alleged that separate Vidarbha would become a 'colony of the people of Rajasthan'.

In summary, we may state our understanding of the separate Vidarbha movement as a sporadic and weak movement that has almost never touched the heart of all, or even a majority of the Vidarbha people. The reasons are not far to seek.

* Culturally, Vidarbha identifies with Maharashtra icons. The Varkari sampradaya (the tradition of saints and their followers that

worship the deity Vitthala in Pandharpur) is as strong in Vidarbha as elsewhere in Maharashtra. The tradition has Sant Dnyaneshwar of the thirteenth century AD as its fountainhead of spiritual inspiration, and has a galaxy of illustrious saints through the centuries. The movement is truly pan-Hindu, and has effectively succeeded in overcoming the caste boundaries in devotional and spiritual matters. Historically, the region may never have been a part of Maharashtra, but Vidarbha's heroes and icons are the same as those of Maharashtra. Common language, common spiritual heritage, and allegiance to the common national role models and heroes, all mean there is no separate 'Vidarbha identity'. The absence of such an identity is the major weakness of the movement.

* Economically, there is an organic link with Mumbai as the development pole. The chief product of Vidarbha is electricity, and the main market is Mumbai and the industrialised west. The hub of happenings and all the role models for the commercial classes in Vidarbha are all in Mumbai. As one observer succinctly put it, 'even if there were a separate state of Vidarbha, its capital would be Mumbai!'

* Increasingly, there is a rising resentment against the non-Marathi traders, who control all commerce in a stranglehold. It is particularly strong against marwari traders. This resentment is almost as intense in this laid back land as was seen in Assam and Orissa. And to make it tough for the Vidarbha movement, these elements are seen to be motivating, inciting, financing and driving the movement.

* There is certainly a sense of being given an unfair treatment. But the off-again, on again nature of the movement has bred cynicism. The strong feeling that many of the leaders, who claim that they are going to struggle for justice for Vidarbha, end up compromising the cause for personal gain, breeds this cynicism. After all, Vidarbha sends 66 Members of the Legislative Assembly (MLAs) in a 288 strong

Assembly, and there had never been any sign of these MLAs working in unison to compel the government in making significant budgetary grants for Vidarbha. What happens time and again is momentary consolidation of the elected representatives that is placated by tokenism by a shrewd establishment. The pressure for budgetary sanction came only after the current PDF government had taken over, as will be discussed below.

V. IRRIGATION IN MAHARASHTRA: A BIRD'S EYE VIEW

The regional equity issues are debated in the context of geographical regions that politically or administratively form one unit. Irrigation planning and investment are done in terms of river basins. Hence, it is important to become familiar with the river basins and regions of the state so as to appreciate the issues of regional equity and the dynamics associated with them. Administratively, Maharashtra is divided into five broad regions: Konkan, Vidarbha, Marathwada, Nasik Division, and Pune Division. Vidarbha comprises of two administrative divisions: Amravati and Nagpur. Marathwada can be alternately called 'Aurangabad' division. The Konkan division comprises of the coastal districts. In the parlance of the Development Boards, Konkan, Nasik, and Pune divisions are clubbed into the rest of Maharashtra.

The administrative divisions as of now are:

Konkan:	Thane, Alibagh, Raigad, Sindhudurg, and Ratnagiri districts.
Nasik:	Nasik, Dhule, Nandurbar, Jalgaon, and Ahmednagar districts.
Pune:	Kolhapur, Sangli, Satara, Pune, and Solapur districts.
Aurangabad:	Aurangabad, Jalna, Nanded, Parbhani, Hingoli, Latur, Solapur, Osmanabad, and Beed districts.
Amravati:	Akola, Washim, Buldhana, Yavatmal, and Amravati districts.
Nagpur:	Nagpur, Wardha, Bhandara, Gondia, Gadchiroli, and Chandrapur districts.

(Greater Bombay is not included here, as it is irrelevant for this paper).

The *Fact Finding Committee on Regional Imbalance* (Dandekar Committee or 'Backlog Committee', as is popularly known) divided the state into four 'regions': *Vidarbha* (Amravati and Nagpur), *Marathwada* (Aurangabad), *Konkan* (Konkan), and *Western Maharashtra* (Nasik and Pune). See Annex 1 for river basins of Maharashtra.

Maharashtra was a party to three (Krishna, Godavari, and Narmada) inter-state water disputes. Water sharing arrangements regarding Tapti were settled much earlier, much of the groundwork having been done in the undivided Bombay state. The Subramaniam Award on Narmada and Bachavat Award on Krishna and Godavari were announced in the seventies Maharashtra claims that its share of water for exploitation as fixed by the Bachavat Award is smaller than the water availability in its geographic share of the river basin and, hence, is not fair [Chitale, 1999, Vol. I, Pp. 177-84]. Maharashtra intends to claim additional 300 TMC of Krishna waters. The basin-wise status of irrigation development, and comparative status of access to irrigation in the various regions, are given in the tables given at the end of this paper.

VI. REGIONAL INEQUITY IN MAHARASHTRA

The *Fact Finding Committee on Regional Imbalance* in Maharashtra chaired by the well-known economist V.M. Dandekar, submitted its report in April 1984. This Committee explicated the extent and area of regional imbalances in Maharashtra, and also suggested ways of remedying the imbalances. It evolved physical measures of 'backlog' of development in diverse areas: irrigation, roads, primary and secondary education, etc. It converted these measures into their financial costs. Finally, it went on to suggest the ways in which the state budget could be used to address the backlog-related issues. Throughout the last eighteen years, the debates on regional inequity in Maharashtra have been dominated by the findings of this Committee. This section elaborates on the issue of regional inequity in Maharashtra, drawing heavily from the two reports. This elaboration is in order, since the whole process of understanding, accepting, quantifying, and attempting to remove (and also sabotaging of the attempts to remove) regional inequity is at the very core of the political economy of regional development.

The Backlog Committee traces some of the history of formation of the Maharashtra state, discussed above. It mentions how Article 371(2) of the Constitution of India was inserted by the Ninth Amendment, in order to ally the fears of Vidarbha and Marathwada regions, right at the time of formation of the state. The Article reads '371(2) Notwithstanding any thing in this Constitution, the President may by order with respect to the (state of Maharashtra and Gujarat) provide for the special responsibility of the Governor for

* *a) the establishment of separate Boards of Development for Vidarbha, Marathwada, and Rest of Maharashtra (or Saurashtra, Kuchch, and Rest of Gujarat) subject to the provision that the report on the working of these Boards shall be placed in the State Legislative Assembly every year,*
* *b) the equitable allocation of funds for developmental expenditure over the said regions, subject to the requirement of the State as a whole and,*
* *c) equitable arrangements for providing adequate facilities for technical education, vocational training, and in respect of equitable opportunities for employment in services under the control of the State government in respect of the said areas, subject to the requirement of the State as a whole.'*

It may be noted that after dragging their feet for over a decade in taking any action on the Report, the state government did condescend to appoint these Development Boards in 1994. We revert to this subject later.

The Report elaborately analyses district-wise plan and non-plan expenditures across a category of heads and over an extended period of time, and comes to the conclusion that there indeed was a slant in the way Government of Maharashtra used the development resources, neglecting Vidarbha and Marathwada and favouring Western Maharashtra. Summary of the data presented by the Committee is given below:

The per capita income in 1955 for Maharashtra was Rs 294. If Greater Bombay is excluded, and indexes constructed to compare the per capita incomes in Western Maharashtra, Vidarbha, and Marathwada on a scale rating the per capita income of Maharashtra at 100, the following picture emerges [Dandekar, 1984, Pp. 40-41].

Region	1955-56	1978-79
Maharashtra (excluding Greater Bombay)	Rs 294 = 100	Rs 1,278 =100
Western Maharashtra	114.4	106.42
Vidarbha	89.9	84.20
Marathwada	67.7	81.06

Thus, relative backwardness of Vidarbha persisted, and had slightly worsened, while Marathwada had considerably improved its position. It may be noted that despite this, Marathwada had continued to be worse off than Vidarbha.

Assessment of Backlog in Irrigation:

The *Fact Finding Committee* compared the pace at which irrigation potential had been created in various areas of the state during the twenty-two years since the formation of the state. The results clearly bring out the lop-sided development in favour of Western Maharashtra. Yet, the Committee desired to come up with justifiable means of quantifying the extent of regional inequity and, hence, evolved a term called 'backlog'. For assessing the backlog in irrigation development, the Committee had to evolve a measure of comparison of the irrigation potential created. Some

sources had potential to irrigate their command areas over multiple seasons while some others could supply water for irrigation only in one season. Hence the Committee created a measure, called 'Standard Rabi Equivalent' irrigation potential of irrigation. The backlog was assessed in terms of this Standard Rabi Equivalent (SRE). Arithmetically, the backlog was the difference between the district (region's) irrigation potential in SRE and the state's average irrigation potential applied to its net sown area. This is indicated for the four regions in Table 6.

The Committee suggested that an investment @Rs 10,000 per ha of SRE (*at 1983 prices*) had to be made to remove the backlog. On this basis, the backlog for Vidarbha came to Rs 527.31 crore. Using fairly similar logic, the Committee had assessed the backlog of development in development of roads, and in technical education, etc. The Committee recommended that the development backlog could be removed by allocating specific funds towards this end, to be spent in the regions experiencing the backlog. The Committee recommended that 15 per cent of each year's budgetary allocation should be made to remove the backlog.

After Backlog Committee

Nothing much seems to have happened for at least a decade after the backlog Committee submitted its report. It was throughout business as usual. It was only when the Shiv Sena-BJP combine successfully challenged the hegemony of the sugar lobby in the Congress and came to power in Maharashtra in 1995, that the picture began to change a little. The separate Development Boards were, in fact, set up in 1994. A second committee was appointed by the governor to examine the progress achieved in regard to removal of backlog during the period. This Committee, called the *Indicators and Backlog Committee* [1997] came to the conclusion that the backlog in regard to irrigation had actually

increased! A process of specific attention to backward regions had begun, and the state had made significant headway in the roads sector. But, as has been pointed out in the *Report of the Indicators and Backlog Committee* [Government of Maharashtra (GOM), 1997, Vol. I], the backlog on irrigation actually grew. This is shown in Table 9.

VII. ANALYSIS OF PROCESS DRIVERS

The erudite and extremely well documented *Report of the Commission on Water and Irrigation* prepared by the Committee chaired by Madhav Chitale very blandly records the regional differences. For instance, while recording the backlog as estimated by Dandekar Committee, the Chitale Commission simply and blandly states that 'the largest, that is 57 per cent, backlog is seen for Vidarbha' [Chitale, 1999, Pp. 706, 708]. The Committee does not go into the causes of this lop-sided development. In fact, very little official explanation for the regional imbalance is available. Bhongle [1997, Pp. 628-32, original Marathi] offers some explanation indirectly. He suggests that the four features distinguished Western Maharashtra region from the rest of the state:

* In the first place, a series of severe droughts and famines in the eighteenth and the nineteenth centuries in much of the rain-shadow areas in this region had created and heightened irrigation in the local bureaucracy as well as the people; A sense of importance to creating sources of several schemes was, in fact, created in this region even during the British regime either for meeting drinking water requirements or for supporting the cultivation of a second crop.
* Secondly, the topography of the region, at least in the eastern foothills of the Western Ghats offered several sites for impounding water economically and efficiently.

* Thirdly, the 'sugar revolution' that started in early fifties starting from Pravara gave a major fillip to the demand for irrigation in this region. The sugar revolution created new centres of powers and these, in turn, perpetuated the dominance of Western Maharashtra.
* And finally, social formations here exhibited much greater coherence and had strong familial or kinship inter-linkage with the political and administrative machinery in the state government. This facilitated navigation of the irrigation schemes in the labyrinth of the Secretariat.

On the other hand, the situation in Vidarbha was quite different. As an expert states [Shenolikar, 2003, Personal comm..], 'Adequate justification for creating irrigation infrastructure in Vidarbha did not exist at all in the files of the government when Maharashtra was formed. We know that the British government was not for our development. They merely wanted to avoid emergency. The Central Provinces Irrigation Commission argued in 1924 that while the rice growing areas of eastern Vidarbha needed some irrigation infrastructure support for life-saving irrigation to paddy crop, the remaining districts of Vidarbha did not need protective irrigation as they grew sorghum, pigeon pea, and cotton. They had not experienced many problems for a whole period of seventy years from 1850 to 1920. Thirty-five inches of stable rainfall was adequate for growing these dry crops. As such, these districts would never produce famine conditions. As a result, the CP and Berar government also focused only on the eastern Vidarbha districts or on the Narmada belt, growing wheat. In consequence, there were no projects whatever on shelf until 1960 for Vidarbha. Even initial survey work was not undertaken for any of the sub-basins. Only by 1965, the GOM started an investigation division for Vidarbha. The staff appointed was scanty [Kimmatkar, 2002, Personal comm.] and so the progress of evolving projects for sanctions was very slow. There were no projects on shelf

worthy of name until the end of the Fourth Plan. Only in 1979-80 did we manage to put 11 major and 48 medium projects for sanction'.

The project cycle for an irrigation project involves several stages:

* Technical investigation.
* Project preparation.
* Sanction and administrative approval.
* CWC sanction-particularly for using Central funds.
* Taking up the sanctioned projects into budgetary process.
* Allocating budgetary support to projects (project wise, with possibility of transfers across project, with prior permission).
* Implementation.

Shenolikar states, 'As luck would have it for Vidarbha, just as these 11 major and 48 medium projects were sent for administrative approval at the state level, the Forest Conservation Act of 1980 came into force. This required approval of the Ministry of Environment and Forest, GOI, if any development work were to be undertaken on forest lands. To top it all, we had this peculiarity of the *zudpi* jungle. This retarded small, local sector projects while the Forest Act retarded all medium and major projects'.

But there are reasons to believe that there was a deliberate delay in the sanction process in government as well. Kimmatkar, another member of the Vidarbha Board stated that at one point in time, three hundred odd projects from Vidarbha were just gathering dust in the Secretariat. Several ways of reducing the pace, at which projects could mature, are possible and have been adopted in Maharashtra. Some of these are:

* not giving enough manpower for investigation of projects, * not taking up projects for administrative scrutiny,

* sending many queries and putting up tougher standards differentially. For instance, cost-benefit rationale required of Vidarbha projects could be tougher than for the Krishna projects. The process is not transparent any way,
* inviting opinions of several agencies, none of which can be deemed to be irrelevant, but doing so selectively for Vidarbha projects and allowing them to raise questions, and thereby slowing down the process of sanction,
* not taking pro-active steps for expediting clearance under the Forest Conservation Act from the central government,
* not holding meetings of the irrigation development corporations frequently enough,
* not giving budgetary sanctions and requiring them to use only borrowed money,
* allowing flotation of tenders only after financial closure was achieved, slowing down permission to issue bonds, and ensuring that financial closure occurs with a delay, etc.

Shenolikar gave an example of the impact of such dilatory tactics. The Gosikhurd project on Vainganga was prepared in 1982 and was estimated to cost Rs 382 crore in 1982. Though it received all needed approvals for the project by 1985, there was no budgetary approval for quite some time. The government made token budgetary provision of Rs 2 or 3 crore in several annual budgets; the year 1990 had to dawn before the allocation crossed Rs 10 crore. Considering that the annual cost escalation occurs at over 6-7 per cent, obviously the project was never going to take off. It had not, even by 2002. It is now estimated to cost over Rs 2,500 crore. And later by 2003, the financial position of the state became very difficult. He gave this as an example of the bias of the government of Maharashtra. Contrast this with the Tembhu LI [Lift irrigation] project in the Krishna basin. It had a per hectare cost of Rs 72,000, and required to lift water to a height of 405 metres. This project can never be considered economical, if power were taken at its opportunity cost. Yet, not only has the project been sanctioned, over Rs 700 crore have been

spent on it already. And at the same time, several projects in Vidarbha, which have a cost of around Rs 7,000 per ha, are languishing.

Has Marathwada been smarter?

We understand that fair and equitable distribution and allocation of resources for development always remain a mere statement of intent in the real world. Machinations of pressure groups rather than equity considerations dictate the distribution of the development expenditure pie. Why Western Maharashtra, particularly the sugar belt (Pune, Satara, Kolhapur, Sangli, Nashik, and Ahmednagar) districts have got the benefit of significant investment in irrigation, is quite clear. After all, these are the districts of the ruling elite of the state. Given the state of disunity and disarray in the ranks of the Vidarbha people as well as their elected representatives, the lack of development of Vidarbha is understandable. What seems most remarkable is the way another backward region, Marathwada, has been able to significantly improve its position. Starting from negligible Marathwada had created irrigation potential in 1960, it had actually overtaken Vidarbha in creating irrigation potential (see Table 6). Bhongle [1997, Pp. 117-25, original Marathi] attributes much of this progress to the construction of the Jayakwadi project on the Godawari river. A total of 12 lakh ha of irrigation potential was created, thanks to consistent and insistent follow up on the part of the leaders from Marathwada, including notably SB Chavan. Why could they do it and not leaders of Vidarbha? We can offer only some tentative answers. It appears to us that primarily social formation in Marathwada was more coherent and more mass-based than in Vidarbha.

Vidarbha leaders and people have always seemed to resort to a sort exaggerated emotional drama. Buses had to be burnt and a few people had to lose their lives even for establishment of an agricultural university in Vidarbha in 1969. Tantrums and confabulations can work only up to a point. Under normal conditions, what seems to matter is how coherently the regional leadership behaves, how much influence it brings to bear on the subject, and how consistent it is in following up the matter through the deliberate machinations and tactics of an adversarial pressure group that uses techniques, such as those described earlier. Unfortunately, Vidarbha did not have a powerful leadership after, perhaps, Panjabrao Deshmukh. Other leaders had to constantly defend their own position in the petty caste ridden politics of Vidarbha. The only persons who represented Vidarbha on the central cabinet for a long time were Sathe and Salve. One was a Brahmin and the other a Christian, neither capable of mobilising the rest of the regional leadership behind him. The rest of the crowd was successfully manipulated by the Western Maharashtra leadership on caste grounds (e.g., kunbi *vs.* teli) or language (*marwari vs.* Marathi), so that they could never act in unison. How could purposive consolidation of public opinion occur in such a situation?

Marathwada offers a contrast. Dominant castes of Marathwada are culturally and socially closer to the dominant castes of Western Maharashtra. More importantly, Marathwada leaders and people seldom took adversarial position *vis-à-vis* Maharashtra. There has never been a talk of separate Marathwada state. Leaders like SB Chavan, Patil-Nilangekar, and Shivajirao Patil (the ex-Speaker of Lok Sabha) could work through the same kinship network in the political and administrative complex of the Secretariat without overt tantrums or confabulations. In fact, the result achieved by Marathwada in the field of irrigation can be compared by the result achieved by Vidarbha in the field of roads in the Shiv Sena-BJP regime when Nitin Gadkari quietly yet purposively achieved a lot by sheer persistence and follow up. Most observers admit that the

inability to undertake systematic follow-up is the single most important reason why irrigation projects in Vidarbha languish.

Other than the absence of a consolidated and coherent political pressure, perhaps there is insufficient demand pressure. Sugarcane cultivation in the vicinity of a sugar mill has for years been a sure path for rapid economic progress. Hence every politician did what he could to get the benefit. There has been no equivalent of sugarcane here. Orange orchards have been the preserve of the relatively better-off farmers, since it has a minimum gestation period of three to four years. Besides, there is no ready and remunerative buyer of orange comparable to the sugar mills. Cotton has been grown as a dry crop here. While there is no question that it can do with one or two irrigations post-monsoon, in reality, all farmers in the command of any canal system in Vidarbha seem to shift out of cotton immediately. Thus, the dominant crops of the region did not generate demand for irrigation. This is, of course, not to argue that there is no need for irrigation, but it does seem as if there is a degree of resignation about its absence that does not become transformed into an articulated demand forcing the government to act expeditiously. Finally, it appears that the greater backlog of irrigation development is in Amravati Division, where the black cotton soils limit the scope for surface irrigation. The major projects that are in the air are, on the other hand, all in the Nagpur Division. Also, the voice for Vidarbha, such as it is, is at its strongest in the Nagpur Division. So, there seems to be incomplete congruence of interests so far as irrigation is concerned.

VIII. DEVELOPMENTS IN RECENT YEARS AND POLITICS BEHIND THEM

Circa 1997, irrigation departments were corporatised. The Vidarbha Irrigation Development Corporation (VIDC) was formed in 1997. The idea was that they would raise money from the market and use that for creating irrigation infrastructure. The VIDC did issue bonds once in 1997 and twice again later. Subsequently in 2000, under the orders of the GOM, the VIDC transferred its funds to Krishna Corporation for speedier execution of their projects in the Krishna valley. The progress on all Vidarbha projects again came to a grinding halt. The pretext given by the government was that Krishna waters had to be used fast, since 2000 was the deadline specified by the Bachavat award. When a furore in Assembly occurred in 2001, the GOM response was truly cavalier. It stated that the affair of transfer of funds was between the two corporations and did not concern the government at all! It was only at the instance of the then governor that the state Government finally agreed that this money should be returned to VIDC. In December 2001, Governor of Maharashtra issued a Direction to the Government of Maharashtra using his powers under Article 371(2) regarding allocation of funds to the Development Boards for Vidarbha, Marathwada and Rest of Maharashtra. This Direction [GOM, 2001] asked the Government to allocate funds for removal of irrigation backlog of Vidarbha in the budgeted annual plan for 2002-2003. This had not been complied with at all.

GOM had been threatened legal action by protagonists of Vidarbha for non-compliance. To save the face, on February 4, 2003 the MLAs from Western Maharashtra aggressively pleaded with the current governor to keep this Directive in abeyance, take a fresh look at the whole issue of backlog, and pay special attention to the drought hit regions of Western Maharashtra. In the meanwhile, irrigation projects of Vidarbha continue to languish. Later in 2005, Governor S.M. Krishna had been firmer and insisted on the government complying with his similar order, but the need for continuous intervention from the

governor points to the basic tendency of the state political leadership to avoid allotting resources to Vidarbha.

IX. SUMMARY AND CONCLUDING COMMENTS

This paper attempts to reconstruct the way in which the politics of development creates and recreates patterns of behaviour that essentially result in sharing the spoils of development to suit those, who have real political power. It starts with the discussion on the national policy, bringing out the salient features of the concerns of regional equity and the ways adopted by the GOI to address them. It notes that time and again issues of real or perceived regional imbalances within states of the Union, and some times these have resulted in strident demands for creation of smaller states.

It takes a look at the historical evolution of the region currently known as Vidarbha. This comprises eleven districts as of now, occupying central and eastern parts of the state. Vidarbha itself has been formed out of two separate regions: Varhad (Berar) and Nag Vidarbha. The former was a territory of the Nyzam prior to its merger in the Crown administered Central Provinces. The latter was annexed by the British Crown upon fall of the Bhosla kingdom in the First War of Independence in 1857. The Vidarbha region, though inhabited largely by Marathi speaking people, is much more pluralistic than the rest of Maharashtra. Economically, cotton cultivation, orange orchards, and forest based activities (including the *tendu* leaf lobby) form three major interest groups. The economy of the region, like many other central and eastern Indian provinces, is strongly dominated by the *marwari* traders. Though there has been little cultural basis for the people of Vidarbha to have their own identity, as narrated in the section on state reorganisation, a series of quixotic events culminated in the State Reorganisation Commission recommending a separate state for Vidarbha. To strengthen their hands in forming a single state for the Marathi speaking people, the leaders of the Samyukta Maharashtra Movement entered into an agreement called the Nagpur Pact that attempted to placate the people of Vidarbha, and assure them equitable share of development. Subsequently, this assurance was embodied in the Article 371(2) of the Constitution of India.

The NagVidarbha region had a fair number of *malguzari* tanks that provided supplementary irrigation to save the kharif paddy crop from wilting in the event of a dry patch during monsoon. Vidarbha region in general has always had a long series of stable and predictable monsoon. A fairly reliable and adequate (850-900 mm) rainfall ensured that the cotton, pigeon-pea, and sorghum crops of the Varhad region would not wither away in monsoon. As a consequence of these agro-climatic features, Central Provinces Irrigation Commission that looked into the aspects of irrigation development for the limited purpose of avoidance of famine-like conditions categorically stated that there was no need to create irrigation infrastructure for Varhad. This meant that investigation work had been undertaken for few of the possible irrigation projects at the time of formation of Maharashtra state. There was no project for Vidarbha on the shelf for inclusion in the Second or the Third Five Year Plans. The seventies saw the creation of few major dams in Vidarbha: the multi-purpose Pench project, the Itiadoh project, the Kali Sarad project, etc. Virtually no irrigation infrastructure was created in Varhad until then; Upper Wardha came later. The investigation work that began in the mid-sixties resulting in a portfolio of reasonable size projects was ready only by the end of seventies.

By contrast, emergence of sugar co-operative mills gave a tremendous boost to the demand for irrigation in Western Maharashtra. The power in

the newly formed state of Maharashtra was con-
centrated in the hands of the Maratha lobby from
the sugar belt. An active demand, a history of
significant work on analysis and investigation of
irrigation sites, and control on state resources
made a handy combination for progress in cre-
ation of irrigation potential in Western Maha-
rashtra. In thirty years of Maharashtra state,
irrigation potential in Western Maharashtra
crossed 50 per cent of the net sown area (on SRE
basis) while Vidarbha saw progress from 10.6 to
only about 23 per cent. Interestingly, Marath-
wada, considered to be the most backward regions
at the time of formation of Maharashtra and which
started with negligible irrigation potential, over-
took Vidarbha in creation of irrigation potential
during this time.

The Fact Finding Committee brought the
regional inequity out in the open and suggested
ways of addressing the problem. Nothing much
had been done for over fifteen years to correct the
situation. This was obvious when a re-look at the
regional development issues by the Committee on
Indicators and Backlog confirmed in 1997 that
the Vidarbha region had been given a short shrift
in irrigation development, resulting in huge
backlog, most of it in Amravati Division.[3]

The ground situation has not changed at all. A
series of skilful and insensitive machinations are
adopted by the powerful Western Maharashtra
lobby, to ensure that development resources are
used for their region. While socio-cultural prox-
imity, alert leadership, and consistent and insis-
tent follow-up have seen that Marathwada region
caught up in the race, problems of Vidarbha
persist and show no sign of nearing any satis-
factory conclusion. Several problems in the
political arena appear to have contributed to this
state of affairs. The two leaders from Vidarbha
who assumed significantly powerful positions in
the centre were unable or unwilling, or both, to

create a mass mobilisation for the cause of irri-
gation development in Vidarbha. They came from
marginal communities of Brahmin and
Christians. Political unity in Vidarbha has been
beset with petty rivalries and dissension based on
caste or language grounds. These are fully
exploited by a shrewd Maharashtra leadership.
This weak political articulation tends to take
consistently adversarial stance vis-à-vis Western
Maharashtra, and resorts to blackmail by all the
time raising the bogey of a separate state. Con-
fabulations, tantrums and vituperations accom-
pany frequently rising bubbles of the Vidarbha
activism. This is more often than not neutered
merely by politically accommodating the vocal
leaders. What is clearly evident is the inability or
unwillingness of the political leadership from
Vidarbha to consistently follow up and navigate
irrigation projects of the region through the
machinations of the wily bureaucratic machinery,
ably supported by their political bosses from
Western Maharashtra. This has meant that while
a lot of steam rises every once in a while on the
backlog of development, no progress occurs on
the ground. Clearly, the weak and the guileless
must satisfy themselves with such crumbs as the
powerful and the wily allow to fall from their
table.

The conclusion is decidedly despondent for the
people of Vidarbha. As the state of Maharashtra
faces tough financial situation, its ability to find
funds for undertaking capital intensive irrigation
projects has become negligible. Now on, the
people of Vidarbha will have to put up even a
harder struggle to get anything out of the dwin-
dling resources of the state. In more recent years,
despondency has taken the form of suicides of the
farmers. The Prime Minister visited Vidarbha in
June 2006 and promised a package that substan-
tially included completion of the backlog in
irrigation in the next five years. Yet, it is possible
that the parched lands in Vidarbha and its

impoverished people will have an extremely long wait for getting their officially acknowledged dues of irrigation benefits. What should the people and the agencies that mean well by themselves do then? Fortunately, there is abundant ground water available in the region [Phansalkar, 2003, Pp. 11-31]. Recent methods make it possible for rainwater harvesting for ground water recharge. Newer technologies make it possible for much reduced need for water for growing crops. It is perhaps better that people and the civil society organisations focus their energies on them, leaving the game of shouting about backlog to their political leaders. And one can always hope. Who knows? The insistent shouts and, now, the wails of families of farmers committing suicides may actually be heard and make a difference some time.

Annex 1. River Basins of Maharashtra

Rivers	Important Tributaries
Krishna	Koyana, Bhima, Mula, Mutha
Godavari	Pravara, Vainganga (with its tributaries Wardha and Chulband), Painganga
Tapti	Nalganga, Poorna
Narmada	none in Maharashtra

In addition, several rivers, such as Vaitharana, flow West into the Arabian sea from the Western Ghats

Geo-hydrologically, Maharashtra can be divided in the following broad river basins:

Konkan basin: it is drained by a large number of short rivers and streams rising in the Western Ghats and running into the Arabian sea. This covers basically the Konkan Division.

Narmada basin: the small territories in the Dhule and Nandurbar districts that are riparian to Narmada; covers small parts of Nasik Division or Rest of Maharashtra Region.

Tapi (Tapti) basin: it lies in North Maharashtra, South of the Narmada basin. This covers basically Rest of Maharashtra Region.

Poorna basin: it covers mostly Vidarbha region (in fact, the Varhad region almost entirely coincides with Poorna basin. People of Varhad identify themselves as *Poornamaichi Lekre* that is, children of mother Poorna).

Upper and middle Godawari basins (and the sub-basins of its tributaries): the upper basin goes into Rest of Maharashtra while the middle basin covers Marthwada region.

Upper and middle Krishna basins (and the sub-basins of its tributaries): lies entirely in the Rest of Maharashtra region, forms the 'Maratha bastion' or can also be called as the 'land of the sugar barons'.

Painganga basin: it falls mostly in Marathwada region.

Middle and lower Vainganga Basin: it falls entirely in Vidarbha region.

Wardha basin: it falls entirely in Vidarbha region.

Note: Full list of sub-basins, as per the Irrigation Commission for Godavari and Krishna, has not been given. This list has been provided here to facilitate understanding of the facts pertaining to irrigation development and its importance in Vidarbha. Source: Dandekar, 1984.

Table 1. Irrigation Status across River Basins in Maharashtra

SN	Basin	GA '000 sq km	CA lakh ha	IA till 1995 lakh ha	IA/CA%	UPA for Irrigation (lakh ha)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Godawari	152.81	112.56	14.67	13.03	26.01
2.	Krishna	69.03	56.27	10.69	19.00	9.20
3.	Tapti	51.30	37.31	3.47	9.30	3.29
4.	Narmada	1.05	0.64	0.00	0.00	0.22
5.	Kokan basins	33.23	18.64	0.59	3.17	17.86
	Total	307.42	225.42	29.42	13.05	56.58

GA: Gross Area, CA: Cultivated Area, IA: Irrigated Area, UPA: Ultimate Potential Area.
Source: Chitale [1999].

Table 2. Sub-basin-wise Area under Crops and Irrigated Area

SN	Sub-basin	Net Sown Area (NSA) ('000 Ha)	Net Irrigated area (NIA) ('000 Ha)	NIA/NSA %	% Share in State NSA
(1)	(2)	(3)	(4)	(5)	(6)
1.	Upper Godawari up to Paithan Dam	1,013	166	16.39	6.59
2.	Upper Godawari below Paithan	441	103	23.36	4.09
3.	Lower Godawari	1,283	199	15.51	7.90
4.	Poorna Dudhna	1,237	130	10.51	5.16
5.	Manjra	1,139	153	13.43	6.07
6.	Rest Godawari	48	4	8.33	0.16
7.	Painganga	1,529	89	8.82	3.53
8.	Wardha	1,296	97	7.48	3.86
9.	Mid Vainganga	861	241	27.99	9.57
10.	Lower Vainganga-Pranhita	234	46	19.66	1.83
11.	Lower Vainganga-Ichampalli	7	2	28.57	0.08
12.	Lower Vainganga-Indrawati	77	19	24.68	0.75
13.	Poorna (Tapi)	1,231	66	5.36	2.62
14.	Girna	659	102	15.48	4.05
15.	Panjra	185	20	10.81	0.79
16.	Middle Tapi (Satpura)	595	64	10.76	2.54
17.	Middle Tapi Dakshin Burai	661	83	12.95	3.29
18.	Narmada	59	6	10.17	0.24
19.	U. Krihna N-W	790	156	19.75	6.19
19.	U. Krishna SW	52	9	17.31	0.36
20.	U. Krishna Ema	255	46	18.00	1.83
21.	Upper Krishna (Agrani)	93	15	16.13	0.60
22.	Upper Bhima (up to Ujani)	980	193	19.69	7.66
23.	RestBhima (Neera)	454	88	19.38	3.49
24.	Rest Bhima (below Ujani Man)	768	131	17.06	5.20
25.	Seena-Bori Benitula	1,177	222	19.75	9.30
26.	Kokan Basins	924	58	6.27	2.30
27.	Maharashtra	18,031	2,519	13.97	100.00

Source: Chitale, *Report of the Maharashtra Water and Irrigation Commission*, June 1999, Vol. 1, p. 319.

Table 3. Comparison of Vidarbha with West Maharashtra in terms of Irrigation Development

(Figures in ,000)

SN (1)	District (2)	NSA (ha) (3)	NIA (ha) (4)	NIA/NSA% (5)	Share of State's NIA % (6)
1.	Nasik	900	133	14.8	5.3
2.	Dhule	739	76	10.3	3.0
3.	Jalgaon	814	133	16.3	5.3
4.	Ahmednagar	1,160	272	23.5	10.8
5.	Pune	994	189	19.0	7.5
6.	Satara	570	132	23.1	5.2
7.	Sangli	599	94	15.7	3.7
8.	Solapur	1,125	190	16.9	7.5
9.	Kolhapur	413	74	17.8	2.9
	Maharashtra	18,031	2,519	13.97	100.0
1.	Buldhana	686	42	6.2	1.7
2.	Akola	800	26	3.2	1.0
3.	Amaravati	723	45	6.2	1.8
4.	Yavatmal	863	34	3.9	1.3
5.	Wardha	441	14	3.2	0.6
6.	Nagpur	553	65	11.7	2.6
7.	Chandrapur	488	92	18.8	3.6
8.	Bhandara*	355	168	47.4	6.7
9.	Gadchiroli*	199	49	24.5	1.9

Note: * Bhandara and Gadchiroli have reported higher irrigated areas NIA, primarily due to the larger areas under the now defunct *malguzari* tanks in these areas, and not because of functioning dam-canal systems. In fact, barring the Chauras area of Bhandara, there is hardly any second crop in these areas, and they are poorer even than the non-irrigated districts of Vidarbha [Phansalkar, 2003]. Also see the *Report of the Fact Finding Committee on Regional Imbalances,* [Dandekar, 1984, Pp. 126-31].

Source: Chitale, *Report of the Maharashtra Water and Irrigation Commission,* June 1999, Vol. 1, p. 318.

Table 4. District-wise Per Capita Income Estimates for 1993-94

SN (1)	District (2)	Population (m) (3)	Per capita Income (Rs) (4)	Share of Total (%) (5)	Primary (%) (6)	Secondary (%) (7)	Tertiary (%) (8)
1.	Greater Mumbai	10.30	23,354	3.5	36.7	59.8	100
2.	Thana	5.84	14,515	8.2	48.9	42.9	100
3.	Raigadh	1.91	22,528	12.2	73.5	14.3	
4.	Ratnagiri	1.58	8,537	38.5	28.1	32.9	
5.	S'durg	0.85	10,246	55.8	16.1	28.1	
6.	Nasik	4.07	10,190	28.4	37.4	34.2	
7.	Dhule	2.65	6,082	29.9	29.9	40.2	
8.	Jalgaon	3.32	8,058	36.6	31.5	31.9	
9.	Ahmednagar	3.53	7,631	33.2	40.8	26.0	
10.	Pune	5.89	13,902	17.4	43.2	39.5	
11.	Satara	0.55	9,529	40.4	26.7	32.9	
12.	Sangli	2.29	9,654	43.1	20.9	36.0	
13.	Solapur	3.38	7,726	32.4	31.1	36.5	
14.	Kolhapur	3.09	10,690	39.2	25.5	35.5	

Table 4. *(Concld.)*

SN (1)	District (2)	Population (m) (3)	Per capita Income (Rs) (4)	Share of Total (%) (5)	Primary (%) (6)	Secondary (%) (7)	Tertiary (%) (8)
Average for Western Maharashtra			9,273				
15.	Aurangabad	2.42	9,095	29.2	45.3	25.5	
16.	Jalna	1.49	5,787	44.8	15.5	39.7	
17.	Parabhani	2.18	8,986	47.2	16.8	36.0	
18.	Beed	1.90	9,802	45.8	26.8	27.4	
19.	Nanded	2.49	6,817	42.9	15.9	41.0	
20.	Osmanabad	1.36	7,354	55.7	8.8	35.5	
21.	Latur	1.78	8,502	48.3	11.9	39.8	
22.	Buldhana	1.98	6,587	46.2	12.8	41.0	
23.	Akola	2.30	7,253	46.6	12.8	40.8	
24.	Amrawati	2.27	7,245	44.7	13.7	41.6	
25.	Yavatmal	2.16	7,569	46.2	17.0	43.8	
26.	Wardha	1.10	7,506	42.1	17.3	40.7	
27.	Nagpur	3.46	11,192	21.6	34.5	43.9	
28.	Bhandara	2.17	7,210	28.8	29.3	41.9	
29.	Chandrapur	1.86	8,437	41.5	26.3	32.2	
30.	Gadchiroli	0.82	7,078	44.7	16.9	38.4	
	Average for Vidarbha		7,786				

Source: Chitale, *Report of the Maharashtra Water and Irrigation Commission,* June 1999, Vol. 3, p. 123, Table 2.6.3.

Table 5. Development Expenditure across Regions

(Rs in crores)

Item (1)	Kokan (2)	Western Maha- rashtra (3)	Marathwada (4)	Vidarbha (5)
Per Capita Expenditure on District Level Schemes (1974-83)	503.06	430.7	489.19	477.98
Per Capita Expenditure on Major Irrigation 1974-82	39.17	202.13	256.92	73.94
Per capita Expenditure on Power 1974-82	248.17	399.43	99.57	144.93
Per Capita Expenditure on Package Scheme of Incentives	34.00	12.10	7.52	7.38
Per capita Plan Expenditure 1974-82	809.87	724.16	762.62	561.55
Per capita Non-Plan Expenditure 1979-80	66.66	94.53	72.82	72.25

Source: Dandekar, *Report of the Fact Finding Committee 1984,* Pp. 81-101

Table 6. Status of irrigation in different regions of Maharashtra

SN (1)	Item (2)	Kokan (3)	Western Maharashtra (4)	Marathwada (5)	Vidarbha (6)
1.	Irrigation potential-1960 (% NSA)	0.21	5.06	0.25	1.33
2.	Irrigation potential 1982 (%NSA)	6.13	15.05	10.41	9.46
3.	Irrigation potential (SRE) as % of NSA	10.64	31.35	20.06	14.22
4.	Backlog in irrigation potential in SRE '000 Ha	105.58	30.73	260.67	527.31

Source: Dandekar, *Report of the Fact finding Committee, 1984*, Pp. 126-132.

Table 7. Backlog in Irrigation as in 1994

SN (1)	Item (2)	Kokan (3)	Western Maharashtra (4)	Marathwada (5)	Vidarbha (6)
1.	Net Sown Area thousand ha	878	7,320	4,755	5,106
2.	Created Irrigation Potential (SRE) thousand ha	201	4,068	1,239	1,217
3.	Irrigation Potential % of Sown Area	22.9	55.57	26.06	23.85
4.	Backlog Amount (Rupees crore)	630	600	2,770	4,265 (incl Amravati Division, 3,630)

Source: GOM, *Report of the Indicators and Backlog Committee, 1997*, p. 52.

Table 8. Comparison of District-wise Irrigation Backlog

SN (1)	Buldhana (2)	Akola (3)	Amrawati (4)	Yewatmal (5)	Wardha (6)	Nagpur (7)	Bhandara (8)	Chandrapur (9)
Backlog as given by Dandekar Committee (ha SRE)	84.78	92.35	134.93	105.41	43.89	-11.65	-	54.9
% to Vidarbha Backlog-1982	16.00	17.50	25.50	19.90	8.30	2.20	0	10.4
Backlog as Reported by Chitale Commission (ha. SRE)	168.00	181.00	219.00	158.00	45.00	0.00	0	82.0
% To Vidarbha Backlog-1999	19.60	21.20	25.60	18.00	5.20	0.00		9.6

Source: Dandekar, 1984; Chitale, 1999.

Table 9. District-wise Backlog in All Sectors in Vidarbha

Sr.no.	Sector	Vidarbha			Marathwada			Rest of Maharashtra			Total			Sectorwise % to total backlog
		Backlog as on 1.4.2003 and %	Expenditure 2003-04	Remaining backlog as on 1.4.04 and %	Backlog as on 1.4.2003 and %	Expenditure 2003-04	Remaining backlog as on 1.4.04 and %	Backlog as on 1.4.2003 and %	Expenditure 2003-04	Remaining backlog as on 1.4.04 and %	Backlog as on 1.4.2003 and %	Expenditure 2003-04	Remaining backlog as on 1.4.04 and %	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1.	Roads	492.66 (43.81%)	26.58 (120.31)	466.08 (44.55%)	160.66 (14.29%)	27.54 (34.22)	133.12 (12.73%)	471.08 (41.90%)	24.20 (115.77)	446.88 (42.72%)	1,124.40 (100%)	78.32 (270.30)	1,046.08 (100%)	25.56%
2.	General Education	14.86 (18.99%)	NA (3.69)	14.86 (19.00%)	13.33 (17.04%)	na (3.08)	13.33 (19.03%)	50.04 (63.97%)	na (12.42)	50.04 (63.97%)	78.23 (100%)	na (19.19)	78.23 (100%)	1.91%
3.	Technical Education	96.18 (25.51%)	3.15 (22.84)	93.03 (24.51%)	67.45 (17.19%)	4.74 (15.89)	62.71 (16.52%)	228.75 (58.30%)	4.96 (54.97)	223.79 (58.97%)	392.38 (100%)	12.85 (93.70)	379.53 (100%)	9.27%
4.	Public Health	167.9 (13.22%)	4.64 (13.32)	163.26 (13.02%)	405.41 (31.93%)	4.27 (94.54)	401.14 (31.99%)	696.34 (54.85%)	6.82 (159.05)	689.52 (54.99%)	1,269.65 (100%)	15.73 (296.91)	1,253.92 (100)	30.63%
5.	Urban Water Supply	-3.85	0	-3.85	48.71 (100%)	12.13 (14.10)	36.58 (100%)	-18.04	0	-18.04	48.71 (100%)	12.13 (14.10)	36.58 (100%)	0.89%
6.	Soil conservation	122.77 (31.22%)	27.06 (30.90)	95.71 (31.19%)	46.09 (11.72%)	10.25 (11.70)	35.84 (11.68%)	224.38 (57.06%)	49.04 (55.98)	175.34 (57.13%)	393.24 (100%)	86.35 (98.58)	309.89 (100%)	7.50%
7.	Veterinary Services	0.11 (2.73%)	0.01 (0.04)	0.10 (2.54%)	0.86 (21.34%)	0.01 (0.20)	0.85 (21.57%)	3.06 (75.93%)	0.07 (0.71)	2.99 (75.89%)	4.03 (100%)	0.09 (0.95)	3.94 (100%)	0.10%
8.	Energisation of pumpsets	597.81 (56.81%)	31.55 (194.92)	566.30 (57.31%)	249.17 (23.68%)	25.31 (96.05)	223.86 (22.65%)	205.37 (19.51%)	7.37 (105.30)	198.00 (20.04%)	1,052.39 (100%)	64.23 (396.27)	988.16 (100%)	24.14%
9.	Total	1,492.33 (34.20%)	92.99 (416.02)	1,399.34 (34.19%)	991.68 (22.73%)	84.25 (269.78)	907.43 (22.17%)	1,879.02 (43.07%)	92.46 (504.20)	1,786.56 (43.64%)	4,363.03 (100%)	269.70 (1190.0)	4,093.33 (100%)	100.00%

Source: *Vidarbha Vaidhanik Mahamandal*, Government of Maharashtra.

NOTES

1. Centre for Monitoring Indian Economy in their Oct. 1993 issue on profiles of districts gave an index of infrastructure development for each district. This is a summary comparison with the rest of the country - the average development of India has been indexed at 100, and is based on development of roads, power, banking and credit, as well as other aspects of development, such as literacy, crop output per hectare, etc.

2. In India, states have in general used 'backward area incentives' to entrepreneurs to locate their activities in the backward regions. These are instituted to specifically compensate for backwardness of the region. Such instruments may not always work for want of the plethora of services that an industrial unit requires in the region, and due also to increased distance, over which goods must move.

3. Irrigation in the black cotton soil areas needs careful understanding of crops to be irrigated, the quantity and timing of water, etc., to avoid problems of water-logging. At the strong advocacy of a member from Vidarbha in the Dandekar Committee on Regional Imbalance, the Report of the Committee recommended that systematic experimental work should be immediately started in this region to establish proper crop patterns under irrigation and proper methods and timing of watering of the fields. It will be instructive to remember that seven years before the construction of the Sukkur Barage started on the river Indus in Sindh (now in Pakistan), extensive investigation into crops under irrigation, crop rotation and quantity of water to be given at different times of the crop growth were undertaken in Sindh. The result was that by the time the barrage was complete and irrigation water was ready to flow, the crop patterns/rotations had been well established and well demonstrated to the farmers of the area. Despite the recommendations of the Committee to do so at the earliest in the Vidarbha region, in order to avoid the sort of problems of irrigation faced in the adjacent district of Hosangabad in M.P. under the Tawa irrigation project, nothing has been done so far. The author wish to thanks Dr. Nilakantha Rath for pointing this out.

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INTERDEPENDENCE BETWEEN GOVERNMENT REVENUES AND EXPENDITURES: EVIDENCE FOR INDIA

Swati Raju

This paper seeks to analyse the interdependence, if any, that exists between central government revenues and expenditures for 1950-51 to 2003-04 by studying the relationship between total receipts/tax receipts and an array of expenditure measures. It employs Johansen Cointegration and the Vector Error Correction Method to infer Granger causality between the two components of government deficits - revenue and expenditure. Interdependence between expenditure and revenues can impact on the government's efforts to maintain fiscal discipline. Results of our empirical exercise indicate a co-integrating relation for five of the seven revenue-expenditure pairs, namely, total expenditure and total receipts, adjusted total expenditure and total receipts, total expenditure and tax receipts, developmental expenditure and total receipts, and non-developmental expenditure and total receipts. Longrun as well as shortrun causal movements also prevail between the different revenue expenditure pairs. Significant uni-directional longrun causal movements from expenditure to revenue are observed for three of the five revenue-expenditure pairs, namely, total expenditure and total receipts, adjusted total expenditure and total receipts, and developmental expenditure and total receipts. Longrun causal relation from receipts to expenditure is seen for total receipts and non-developmental expenditure, which could be taken to reflect support for Milton Friedman's view that 'governments spend what it receives and as much as they can get away with'. Significant feedback relation is also observed for the longrun between tax receipts and total expenditures, and for the shortrun between developmental expenditure and total receipts. Revenues lead expenditure for the revenue receipts-revenue expenditure pair, and the data finds support for causality from revenue receipts to revenue expenditure while causal independence is observed between structural component of total revenues and the structural component of total expenditure. Thus, while causal interdependence is observed for six of the seven revenue-expenditure pairs considered, we do not find a uniform pattern in this causal interdependence. Instead, empirical support is found for both, the tax and spend hypothesis as well as the spend and tax hypothesis for total revenues/tax receipts and different categories of government expenditure. The paper, thus, suggests that irrespective of which hypothesis is accepted empirically, the outcome is one of a higher level of government spending and, hence, alongside having deficit rules to achieve fiscal discipline, specifically prescribing expenditure rules might help in achieving fiscal discipline.

I. INTRODUCTION

Government deficits are one of the principal indicators of fiscal health. India has seen deficits in central government accounts on almost all indicators - fiscal deficit, primary deficit, and revenue deficit - since the 1970s, and this situation worsened in the mid-1980s. The latter half of the 1980s saw fiscal deficits in the range of 7-8 per cent of GDP and the gross primary deficit and revenue deficit were in the ranges of 4-5 per cent of GDP and 2-3 per cent of GDP, respectively. Fiscal consolidation, hence, was the major focus of the reform process introduced in 1991-92. The 1990s have seen varied performance on the deficit indicators. The period 1991-92 to 1996-97 with the exception of 1993-94 had seen improvement in the situation with a decline in the fiscal deficit as well as other deficit indicators as a percentage of GDP. However, the later 1990s and early 2000s have seen a reversal of this trend and the major deficit indicators climbed back nearly to their

early 1991-92 levels, with revenue deficit showing continued deterioration. Consequently, greater attention is being focused on the size of these deficits, and efforts are undertaken towards better deficit management - the Fiscal Responsibility and Budget Management (FRBM) Act, 2003 being one measure for the purpose. Besides, fiscal reforms at the level of the central government focused on tax reforms with the aim of augmenting revenues and removing anomalies in the tax structure.

The Government appointed several committees to look into various aspects of tax reform, *viz.,* the Tax Reforms Committee, 1991, the Advisory Group on Tax Policy and Tax Administration for the Tenth Plan, 2001, and the Task Force on Direct Taxes and Indirect Taxes, 2002. The tax reforms have focused on the simplification and rationalisation of direct as well as indirect taxes. Besides, most of these committees have recommended the withdrawal of a number of exemptions and deductions. Further, since the rates were high and the structure of indirect taxes was highly complex, the Tax Reforms Committee recommended the adoption of a small number of simple broad-based taxes with moderate and limited number of rates and with very few exemptions and deductions. Some of the major tax reforms that have been undertaken are: (i) lowering of the maximum marginal personal income tax rate from 60 per cent in 1980-81 to the present level of 33 per cent, (ii) widening of the tax base through the introduction of presumptive taxes, and adoption of a set of economic criteria for identification of potential tax payers in urban areas (for example, the economic criteria were used to identify the persons required to file the Income Tax returns, though this provision stands abolished from the Budget 2006-07), (iii) taxation of services, (iv) reduction of the corporate tax rate on both domestic and foreign companies, (v) reduction in the peak rate of customs

duties on non-agricultural products, (vi) introduction of a uniform 16 per cent Central Value Added Tax (CENVAT), (vii) introduction of Value Added Tax (VAT) by the states, and (viii) improvement in tax administration through the better use of information technology.

On the expenditure side, measures were taken to curb the built-in growth in expenditure by subjecting all ongoing schemes to zero based budgeting, and assessment of manpower requirements of all government departments. The government also appointed the Expenditure Reforms Commission to look into areas of expenditure correction. The major recommendations of the Expenditure Commission included optimising government staff strength by a ban on the creation of new posts for two years, introduction of Voluntary Retirement Schemes (VRS), and redeployment of surplus staff in various government departments and autonomous institutions which have budgetary support through grants, the creation of a national food security buffer stock and minimisation of cost of buffer stock operations, and rationalisation of fertiliser subsidies through dismantling of controls in a phased manner. The important measures of expenditure reform undertaken were the following: the Administered Price Mechanism in the petroleum sector was dismantled and the Oil Pool Account became effective from April 2002. Restrictions were imposed on fresh recruitments to one per cent of the total civilian staff strength over the four years beginning the fiscal year 2002-03. A Guarantee Redemption fund was set up so as to promote transparency, and control the growth of contingent government liabilities.

Generally, it is the level of government deficits and the consequences of these deficits for important macroeconomic variables, *viz.,* inflation, interest rates, and exchange rates that often take the centre stage in any discussion on

government finances. However, it would be interesting to focus on the relationship that exists between the two major components of deficits, viz., revenues and expenditures, and examine whether expenditures cause revenues or revenues cause expenditures. The causality relationships examined in the paper may be necessary but are not sufficient to say anything about what would happen to the deficits as a consequence of increases in receipts or expenditures. Indeed, technically, Granger causality need not even imply that receipts and expenditures move *in the same direction*. Further, for deficits to get reduced over time, expenditures must increase by smaller amounts (and decrease by larger amounts), in comparison with receipts when receipts increase (decrease); or receipts must increase by larger amounts (and decrease by smaller amounts), in comparison with expenditures when expenditures increase (decrease). For this, one will need to compare the magnitudes of changes in receipts and expenditures from appropriate impulse response functions for specified absolute increases in government receipts and expenditures. This has not been done in the present paper. Another way to answer questions about the effects of receipts or expenditures on *deficits* would be to examine uni-directional causality between receipts/expenditures with *deficits*. The results of causality between revenues/expenditures and deficits are presented in Table 4 in Section IV. Assuming that there is a certain level of deficit, which is perceived to be high, and that one wishes to bring it down to an acceptable level (say as defined by the FRBM Act, 2003 in India), will then merely having a rule for the deficit levels alone help? If we find a causal relation from expenditures to revenues and if we have to attain a particular level of deficit (say as defined by the FRBM Act), one may have to focus more on expenditure compression apart from the efforts to augment revenues and probably to have rules for expenditures, which may help attain the required

deficit levels. If, on the other hand, we find a causal relation from revenues to expenditures and, as specified in the Friedman view (detailed below in this section in Proposition (i)), increasing taxes could imply as large a deficit as before but a higher level of government spending. Whilst looking at the relationship between expenditures and revenues, Chelliah [1996, Pp. 55-59] provided the basis for choosing the categories of revenues and expenditures.

The inter-temporal relationship between government expenditures and receipts could result in any of the following propositions: Proposition (i) tax and spend hypothesis (revenues lead expenditures). This hypothesis may represent regimes where incurring budget deficits may not be encouraged. According to this view, tax changes would lead government expenditures, implying thereby that only increasing revenues could lead to greater expenditures, and it has found support with Friedman's opinion that 'increasing taxes will simply lead to more government spending', and 'Political Rule Number One is government spends what government receives plus as much more as it can get away with' [Friedman, 1982, Anderson, *et. al.*, 1986, Pp. 630-39]. Hence, increasing taxes (revenues) would imply as large a deficit as before but a higher level of government spending.

Proposition (ii) spend and tax hypothesis (expenditures lead revenues) indicates that the government revenue constraint adjusts to changes in expenditures with a lag. According to this proposition, the government spends first and then determines the manner in which these expenditures can be financed. In such a scenario, the government is really not concerned with the level of deficit. This view of taxes gradually adjusting to expenditures also finds support from the Peacock and Wiseman [1979, Pp. 3-23] study for the

United Kingdom for the periods 1920-38 and 1950-70. Thus, some form of expenditure compression may help in deficit containment.

Proposition (iii) fiscal synchronisation, wherein revenues and expenditures change simultaneously, could suggest contemporaneous interdependence between revenues and expenditures. According to this hypothesis, citizens of a locality decide on the optimal levels of spending and taxes by comparing the marginal benefits and costs of government.

This paper, therefore, seeks to examine which of the above-mentioned three propositions characterise the inter-relationship between government revenues and expenditures of the central government in India. We test this inter-relationship for a range of expenditure and revenue measures, *viz.*, total expenditure, revenue expenditure, and developmental and non-developmental expenditure *vis-à-vis* total revenues, tax receipts, and revenue receipts. Since budgetary deficits in India are largely structural in nature,[1] we also test whether there exists cause-effect inter-relationships between the structural components of total expenditures and total receipts.

A graphical presentation of some of the major expenditure and revenue measures helps understand the association between these two components over the period of study - 1951-2004. Figures 1 to 3 depict the behaviour of total expenditure and total receipts, total expenditure and tax receipts, and revenue expenditure and revenue receipts, of the central government, respectively. While the profiles of both total expenditure and total receipts have shown a rising trend over the entire period, this increase is more evident from the 1980s. The period since the 1980s has seen major increases in total expenditure by about 20.69 times from Rs 22,768 crore

in 1980-81 to Rs 471,203 crore in 2003-04. Though the total receipts of the central government have seen an increase by about 23.42 times, from Rs 20,291 crore in 1980-81 to Rs 475,146 crore in 2003-04, the absolute gap between the total receipts and total expenditure has widened since the 1980s (Figure 2). Figure 3, likewise, looks at the profiles of revenue expenditure and revenue receipts, and we can observe that both revenue expenditure and revenue receipts have been showing an increasing trend over the entire period and that the gap between revenue receipts and revenue expenditure, which reflects the extent of saving/dis-saving of the government, has widened in the 1990s. Revenue expenditures increased by 4.94 times from Rs 73,516 crore in 1990-91 to Rs 362,887 crore in 2003-04 while revenue receipts increased by 4.79 times from Rs 54,954 crore in 1990-91 to Rs 263,027 crore in 2003-04.

Figures 1a, 2a, and 3a depict the relationships between the *changes* in corresponding expenditure and revenue measures. Changes in total expenditures appear to lead to changes in total receipts, though at some places changes in receipts seem to precede changes in expenditures, and the two series sometimes move together (Figure 1a). Changes in total expenditures appear to lead to changes in tax receipts (Figure 2a). The lead-lag relationship between changes in revenue receipts and revenue expenditures is not quite clear from the graph (Figure 3a). The causal or the lead-lag relationship between changes in expenditures and receipts cannot become clear from the graphs. To understand the true nature of these relationships, we need to go through the detailed econometric testing.

Section II of the paper contains a brief review of literature while Section III discusses the data and methodology adopted in this paper. Section IV presents the empirical evidence, and Section V concludes the paper.

Figure 1 Central Government Total Expenditure and Total Receipts 1951-2004

Figure 1a Change in Central Government Total Expenditures and Total Receipts 1951-2004
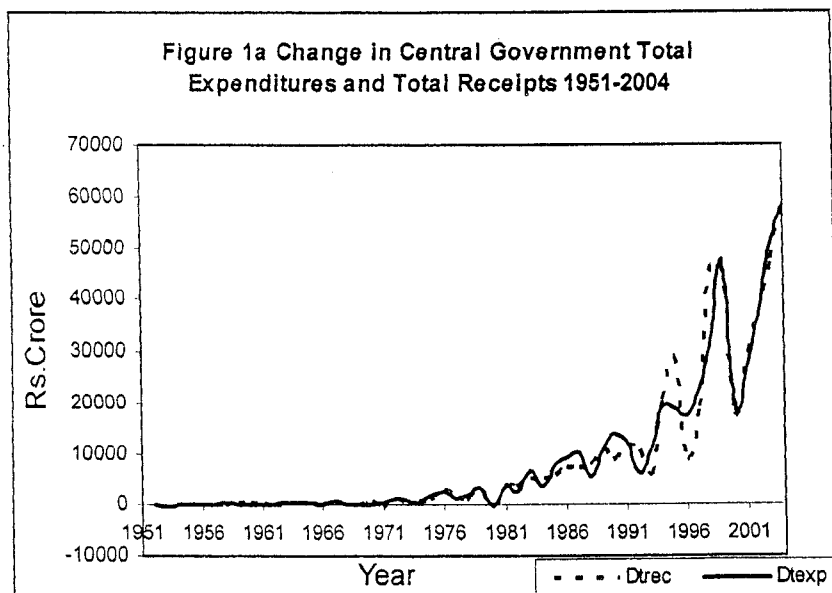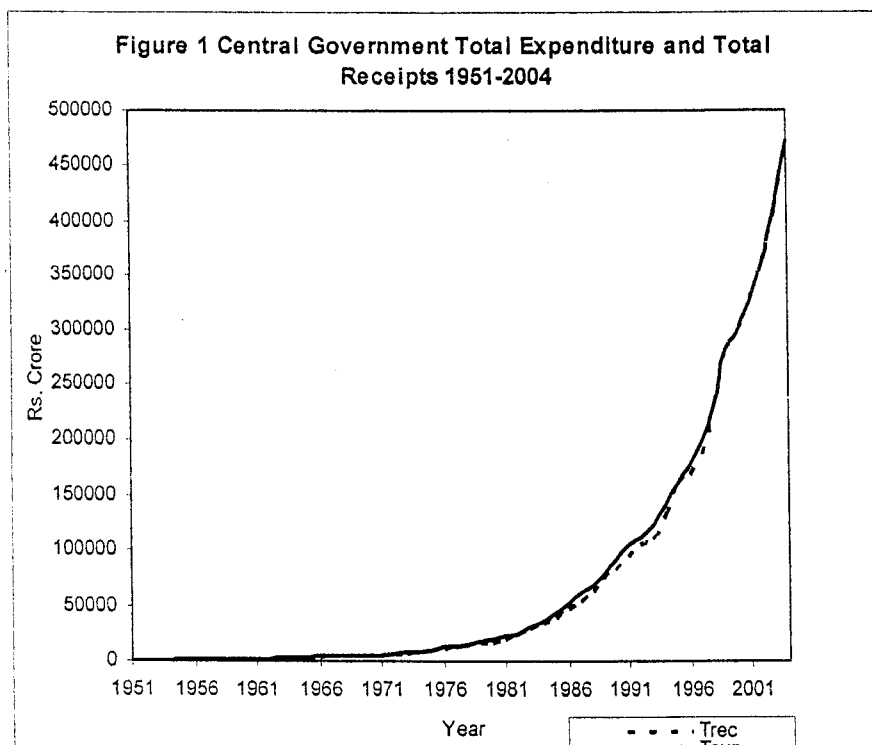
Figure 2 Central Government Total Expenditure and Tax Receipts 1951-2004

Figure 2a Change in Cental Government Total Expenditure and Tax Receipts 1951-2004

Figure 3 Central Government Revenue Expenditure and Revenue Receipts 1951-2004
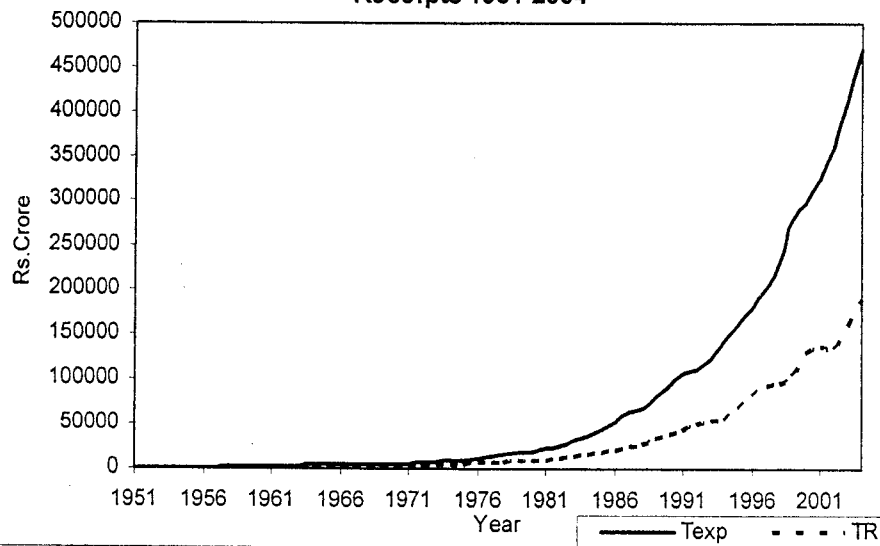
Figure 3a Change in Central Government Revenue Expenditure and Revenue Receipts 1951-2004
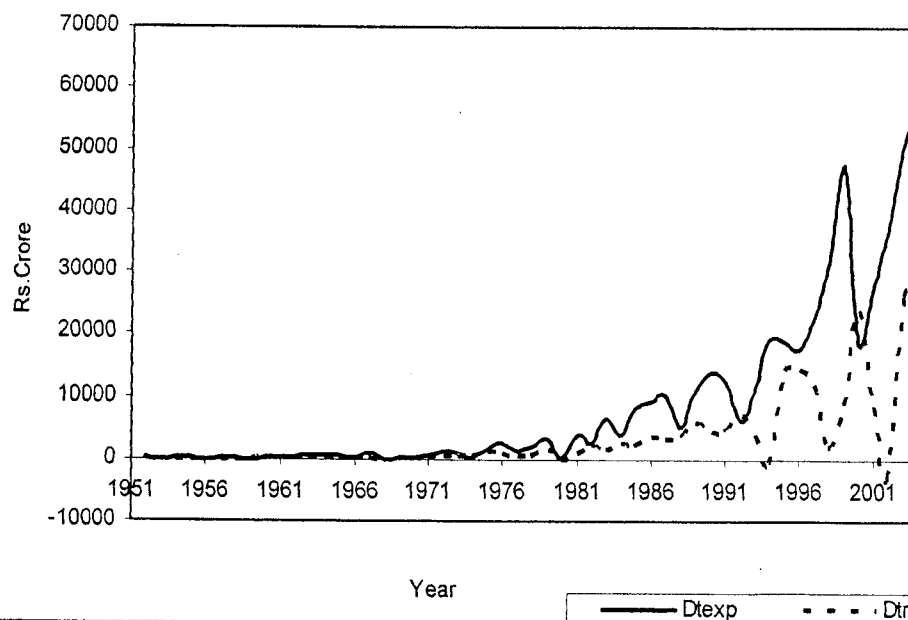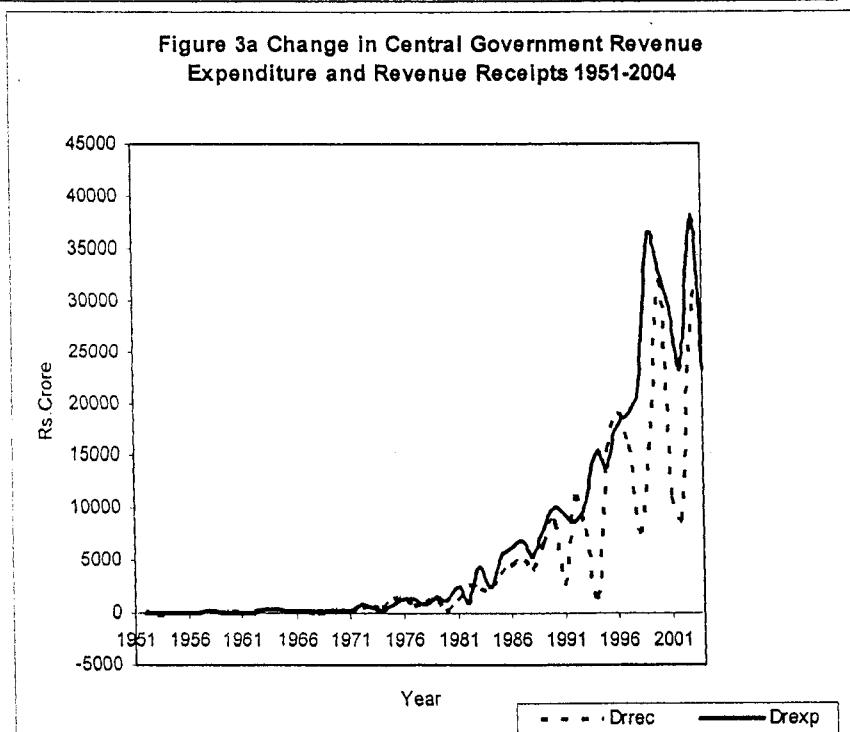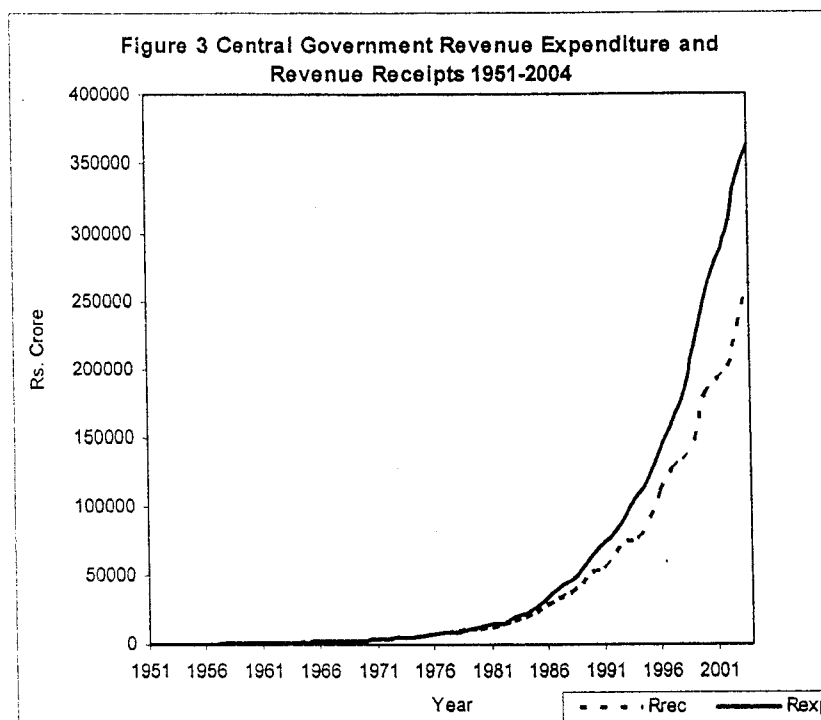
II. LITERATURE REVIEW

Most studies have examined the inter-relationship between expenditures and revenues using the standard Granger causality tests, and concern the United States economy. Manage and Marlow [1986, Pp. 617-29] study this relationship for the United States over the period 1929-82. They use annual data, study the finances of the federal government and conclude that causality is uni-directional from federal taxes (revenues) to federal expenditures. The study of Anderson, Wallace and Warner [1986, Pp. 630-39] using annual data for 1946-83, also for the United States and for the federal government finds that causality proceeds from expenditures to revenues, a finding contrary to that of Manage and Marlow. Ram [1988, Pp. 763-69] in his study for the United States tries 'to ascertain which of the above conclusions is more reasonable' (p. 763), and broadened the scope of his study from the relationship between federal receipts and expenditures to that for state and local governments. Further, it employed annual data for the period 1929-83 and quarterly data for 1947-83 for both nominal and real measures of receipts and expenditures. Ram's study finds that causality runs from revenues to expenditures at the federal level while at the state and local level causality proceeds from expenditures to revenues.[2] Von Furstenberg, Green, and Jeong [1986, Pp. 179-88] use a VAR model to analyse the relationship between expenditures and revenues in terms of a tax and spend, or spend and tax hypothesis. While the main budgetary exercise is annual, fiscal monitoring is a more continuous process. Mid-year reviews are conducted, and hence, expenditure rates can be accelerated or moderated periodically, revenue collection can be tightened or loosened and, if necessary, supplementary appropriations can be transacted. Therefore, quarterly data for the period 1954-82 is employed. Apart from federal expenditures and taxes, the authors include Gross National Product (GNP)

gap and inflation as additional variables in their model.[3] This paper also seeks to look at the relationship between revenues and expenditures by decomposing federal expenditures into government purchases, net interest paid, and grants. Government purchases are further decomposed into defence and non-defence consumption, and investment. The revenue variables, however, are not decomposed. Thus, the paper examines 4, 6 and 9 variable VAR models. The paper finds no support for the tax and spend hypothesis (revenues cause expenditures) while it finds support for the spend and tax hypothesis (expenditures cause revenues). Expenditure containment is usually difficult because many items of expenditure are committed expenditure like wages and salaries, subsidies, etc. Hence the government tries to augment revenues through policy interventions, such as imposing newer taxes, user charges, or cess, and also try to widen the tax base, a finding akin to that of Anderson, Wallace and Warner [1986, Pp. 630-39]. Using cointegration and error-correction models, Miller and Russek [1990, Pp. 221-29] seek to verify this relationship for federal, state and local levels of government. They use annual as well as quarterly data, and both, nominal and real measures of revenues and expenditures for 1946-87. This study finds bi-directional causality between government taxes and spending for all levels of government, when quarterly data is employed. For annual data, the results show at times uni-directional causality from taxes to spending for the federal government while bi-directional causality is observed for state and local governments. Jones and Joulfaian [1991, Pp. 133-55] examine this interdependence between revenues and expenditures for the early years of the American Republic, using cointegration and error-correction technique, and conclude that the spend and tax hypothesis prevails in the short run while the existence of a feedback relation between revenues and expenditures is seen in the long run.

Joulfaian and Mookerjee [1991, Pp. 1839-44] study the dynamics between revenues and expenditure for 22 Organisation for Economic Cooperation and Development (OECD) countries using a bivariate VAR model. They later augment the VAR model using the output gap and inflation variables, so as to comprehensively model the nexus between revenues and expenditures. They find greater support for the spend and tax hypothesis, as compared to the tax and spend hypothesis. They further conclude that reductions in spending are essential to reducing budget deficits and government size. Mithani and Khon [1999, Pp. 343-59] study the inter-relation between revenues and expenditures for Malaysia for 1970-94 using quarterly data and the seasonal error correction model. This paper too finds uni-directional causality from government expenditures to revenue - a result similar to that of Anderson, Wallace and Warner [1986, Pp. 630-39] and Von Furstenberg, Green, and Jeong [1986, Pp. 179-88]. Fasano and Wang [2002] test this interdependence for the Gulf Countries Council (GCC) countries in a cointegration and vector error-correction model (VECM) framework and find support for the tax and spend hypothesis. They suggest that the GCC countries could 'enhance the effectiveness of their fiscal policy by making budget expenditure less driven by revenue availability' [p. 18]. Narayan [2005, Pp. 1203-16] studies the nexus between revenues and expenditures for nine Asian countries and finds mixed evidence for the tax and spend/spend and tax hypotheses, with support for the tax and spend in some countries, for the spend and tax in some, and rejection of both hypotheses, in the sense of lack of a causal relation between revenues and expenditures in some countries. The study uses the log of the expenditure-GDP ratio and revenue-GDP ratio, and for India finds that there exists 'neutrality', that is, no evidence of a causal relation between revenues and expenditures. The paper tests for cointegration using the bounds approach and the conventional F test to examine causality. The bounds approach can be applied to models where the variables can be integrated of order one or less than one, i.e., the bounds approach is applicable irrespective of whether the variables are I(0) or I(1). The paper examines causality only for the aggregate levels of expenditures and revenues of the central government, i.e., total receipts and total expenditures, and finds neither cointegration nor a causal relation between total receipts and total expenditures.

To sum up, the literature, thus, provides mixed evidence on the nature of interdependence between government revenues and expenditures.

The present study extends the analysis to the various categories of revenues and expenditures (so as to understand how some of the receipts and expenditure categories respond), uses the Johansen VECM technique, and infers causality from the VECM. However, while inferring Granger causality and for the correct specification of the model, the integration properties of the variables are of utmost importance. Hence, it was felt that cointegration too be determined from a technique, like Johansen's, that requires both variables be integrated of the same order. The present paper extends the analysis of the revenue-expenditure nexus to beyond just total revenues and total expenditures [Narayan, 2005, Pp. 1203-16] to important categories, such as revenue expenditures-revenue receipts, structural expenditures-structural receipts, and to developmental and non-developmental expenditures vis-à-vis total receipts. The paper, therefore, could provide an insight into the dynamics of the revenue-expenditure relationship in India and help understand how different categories of expenditures respond to total revenues.

Revenues adjust both, due to policy intervention, in terms of discretionary changes in tax schedules from time to time, or alternatively, because of the introduction of new taxes as well as automatic responses, as a result of the elasticity of taxes to GNP. Also, these discretionary changes in revenues could have been planned in anticipation of changes in expenditure or as a reaction to changes in expenditure. [Furstenberg, *et. al.*, 1986, p. 181]. In so far as, following the literature on the subject, we have not attempted to adjust the revenues and expenditures to remove their response to GNP, the results may be subject to reservation.

III. METHODOLOGY

(a) Tests for Unit Roots

The initial step would be to test the variables for the presence of a unit root. All the variables are tested for stationarity using the Augmented Dickey Fuller (ADF) test, which examines the null hypothesis: the series contains a unit root. The ADF test uses the following three autoregressive processes to test for the presence of a unit root:

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=2}^{p} \beta \Delta y_{t-i+1} + \varepsilon_t \qquad ...(1)$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \sum_{i=2}^{p} \beta \Delta y_{t-i+1} + \varepsilon_t \qquad ...(2)$$

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \alpha_2 t + \sum_{i=2}^{p} \beta \Delta y_{t-i+1} + \varepsilon_t \qquad ...(3)$$

The sequential testing procedure suggested by Doldado, Jenkinson, and Sosvilla Rivero [1990, Pp. 253-63], when the form of the data generating procedure is not completely known, is employed in the paper to determine the stationarity of the variables; and is as follows:

Step I: Estimate the least restrictive model - which includes both a trend as well as a drift, and is given by Equation (3) above, and use the τ_T statistic,

that is, the t statistic for the ADF test in the presence of a constant and drift term to test the null hypothesis $\gamma = 0$. If the null hypothesis is rejected, do not proceed further and conclude that the yt series does not have a unit root.

Step II: If the null hypothesis $\gamma = 0$ is accepted in Step I, then proceed to determine whether there are too many deterministic regressors included in Step I, as the presence of these regressors may have reduced the power of the test. Hence, in Step II test for the significance of the trend term a_2 by testing the hypothesis $a_2 = \gamma = 0$ using the φ_3 statistic, that is, the F test in the ADF test to test $a_2 = \gamma = 0$ in Equation (3) above. If the trend is not significant, proceed to Step III.

Step III: Estimate the model without the trend (as given in Equation 2 above), and test for the presence of unit root using the t5 statistic, that is, the t statistic for the ADF test to test if $\gamma = 0$ in the presence of a constant term . If the null of $\gamma = 0$ is rejected, conclude that the series does not contain a unit root. If the null is accepted, test the hypothesis using $a_0 = \gamma = 0$ using the φ_1 statistic, that is, the F statistic in the ADF test to determine if a drift exists, or test if the restriction $a_0 = \gamma = 0$ is binding. If the drift is not significant, proceed to Step IV. If the drift is significant, test for the presence of a unit root using the standard normal distribution.[4] If the null hypothesis of a unit root is rejected, conclude that the series y_t does not contain a unit root. Otherwise, conclude that y_t has a unit root. In other words, in Equation (2) above, to test the presence of the drift, use the φ_1 statistic to determine if the restriction $a_0 = \gamma = 0$ is binding. If the sample value of F exceeds the critical value, we conclude that the restriction is binding. Since we do not reject $a_0 = 0$, we can test $\gamma = 0$ using a standard normal distribution. If γ is not statistically different from zero, we can conclude that the series has a unit root and a drift term.

Step IV: Estimate the equation without the drift and trend terms (as in Equation 1 above) and test for the presence of unit root using the t statistic. If the null hypothesis of $\gamma = 0$ is rejected, conclude that the series y_t does not contain a unit root. Else, conclude that y_t contains a unit root [Enders, 2004].

(b) Test for Cointegration and Error Correction

An important feature of cointegrated variables is that their time paths are influenced by the extent of any deviation from the long run equilibrium relationship between or among them. The Johansen procedure depends heavily on the relationship between the rank of the matrix and its characteristic roots, and the rank of the matrix p is used to determine if the two variables are cointegrated. Further, the procedure is 'nothing more than a multivariate generalization of the Dickey Fuller test', [Enders, 2004, Pp. 348-52] and can be generalized to allow for higher order autoregressive process as:

$$\Delta X_t = \pi_0 + \pi X_{t-1} + \sum_{i=1}^{p-1} \pi_i \Delta X_{t-i} + \varepsilon_t \qquad (4)$$

where, π_0 is an (nx1) vector of intercept terms with elements πi_0;

π_i are (nxn) coefficient matrices with elements $\pi_{jk}(i)$;

π is an (nxn) matrix with elements $\pi_{jk} \neq 0$; and

ε_t is an (nx1) vector with elements ε_{it}.

The rank of the matrix π is equal to the number of independent cointegrating vectors. If rank (π) = 0, the variables in vector x_t are not cointegrated and Equation (4) would be similar to a VAR in first differences. If π is of rank n, the vector process is stationary. If the rank of $\pi = 1$, there is a single cointegrating vector and the term πX_{t-1} is the error correction term (ECT). When 1< rank (π) < n, there are multiple cointegrating vectors. The test for the number of characteristic roots that

are insignificantly different from unity can be determined using the λ trace, which tests the null hypothesis that the number of distinct cointegrating vectors is less than or equal to r against a general alternative, and the λ max statistic, which tests the null hypothesis that the number of cointegrating vectors is r against the alternative of r+1 cointegrating vectors. Thus, if all the elements of π equal zero, Equation (4) would be a traditional VAR in first differences and there is no error correction representation. However, if one or more of the π_{jk} differs from zero, Δx_t responds to the previous period's deviation from long run equilibrium. Hence, estimating x_t as a VAR in first differences is not appropriate, if x_t has an error correction representation. The lag length on the right hand side of Equation (4) could be determined through the use of the variance-covariance matrix of the restricted and unrestricted systems or by using the multivariate Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SBC).

A block exogeneity test helps determine whether causality exists between pairs of variables. If there are three variables, w_t, y_t and z_t, the question of whether lags of one variable, say w_t, improve the prediction of either y_t or z_t, that is, whether w_t Granger causes either y_t or z_t is answered through the block exogeneity test. The block exogeneity test restricts all lags of w_t in the y_t and z_t equations to be equal to zero and the statistic, $(T - c)(\log|\Sigma_r| - \log|\Sigma u|)$ where T refers to the number of usable observations, c the number of parameters estimated in each equation of the unrestricted system, Σ u the variance covariance matrix of the unrestricted system, and Σ r is the variance covariance matrix of the restricted system. The statistic has a χ^2 distribution with the degrees of freedom equal to the number of restrictions in the system. Granger causality in a cointegrated system would need to

be interpreted differently. In a cointegrated system of a vector x comprising two variables y and z, y_t does not Granger cause z_t if lagged values of Δy (i.e., δy_{t-i}) do not enter the δz_t equation, *and* if z_t does not respond to the deviation from long run equilibrium. Hence, z_t must be weakly exogenous.[5] Also, the coefficient of the ECT represents the speed of adjustment parameter. Usually, both the speed of adjustment parameters should be significant in a cointegrated system but it is possible that one of the parameters is zero. *In other words, the absence of Granger causality for cointegrated variables requires the additional condition that the speed of adjustment coefficient, that is, the ECT in the corresponding error correction model be equal to zero,* [Enders, 2004].

IV. EMPIRICAL EVIDENCE

The paper employs annual data over the period 1950-51 to 2003-04, and tests for interdependence between central government revenues and expenditures, using the Johansen VECM. The data for all the revenue and expenditure variables are obtained from various issues of the Reserve Bank of India's (RBI's) *Report on Currency and Finance and Handbook of Statistics.*

The interdependence is examined for total receipts/tax receipts, and an array of expenditure measures. While the profile of total expenditures reveals actual spending of the government, they also consist of defence expenditure and interest payments, which are usually committed expenditures, and hence, it is thought that it would be worthwhile to consider a profile for expenditure that excludes these two components of expenditure, and see if this has any meaningful role in understanding the interdependence between revenues and expenditures, and is given by TE2. Within revenues and expenditures, one can also focus attention on revenue receipts and revenue expenditures, and it is felt that it would be interesting to examine the interdependence between revenue receipts and revenue expenditures as well.

Expenditure is further decomposed into development and non-development expenditure so as to determine whether there exists an a causal relation between these expenditures *vis-à-vis* total receipts, and identify whether increases in development and/or non-development expenditure lead total receipts. Further, fiscal deficits in India have been largely structural in nature, as stated earlier, and hence, the total revenue and total expenditure series are decomposed into their structural and cyclical components, that is, the (trend portion of receipts *minus* log of total receipts) and (the trend portion of expenditure *minus* log of total expenditure), using the Hodrick-Prescott filter (with $\lambda = 100$) to determine the trend. We look at the structural profile of receipts and expenditures to examine the existence of interdependence between the two. All the variables are considered in their logarithmic form and denoted by the suffix 'L' and are explained below.

LTEXP	Total expenditure
LTE2	Total expenditure exclusive of defence expenditure and interest payments
LTREC	Total receipts
LTR	Tax receipts
LREXP	Revenue Expenditure LRREC Revenue Receipts
LDE	Development Expenditure[6]
LNDE	Non development Expenditure
STEXP	Structural component of log of Total Expenditure
STREC	Structural component of log of Total Receipts

All the variables are tested for the presence of unit roots using the sequential Augmented Dickey Fuller (ADF) test (detailed in Section III. (a) above). The lag length for the sequential ADF test is determined using the AIC criterion. Results of this sequential procedure for the ADF test are presented in Table 1. The variables when in levels are series with unit roots and a drift, and are found to be stationary on differencing except for STEXP and STREC, which are found to be stationary in levels.

Table 1. Tests of Stationarity

(1)	LTEXP (2)	LTE2 (3)	LTREC (4)	LTR (5)	LREXP (6)	LRREC (7)	LDE (8)	LNDE (9)	STEXP @ (10)	STREC @ (11)
ADF Test (Levels)										
τ_T	-2.31	-2.22	-2.78	-3.22	-1.99	-3.20	-1.79	-3.24	-5.47	-8.03
	(-3.41)	(-3.41)	(-3.41)	(-3.41)	(-3.41)	(-3.41)	(-3.41)	(-3.41)	(-3.41)	(-3.41)
Φ_3	2.70	2.55	4.14	5.19	2.30	5.26	1.74	5.45	-	-
	(6.25)	(6.25)	(6.25)	(6.25)	(6.25)	(6.25)	(6.25)	(6.25)	-	-
Φ_1	5.25	10.09	9.07	14.06	21.74	12.66	9.18	10.53	-	-
	(4.59)	(4.59)	(4.59)	(4.59)	(4.59)	(4.59)	(4.59)	(4.59)	-	-
τ_μ	-0.27	0.22	-0.85	-0.31	-0.86	-0.61	-0.69	-0.74	-	-
	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	-	-
Lag(s)	5	2	2	1	1	1	1	3	1	1
First Differences										
τ_μ	-3.96	-4.73	-12.72	-5.52	-5.57	-4.41	-4.16	-6.89	-	-
	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	(-2.86)	-	-
Lag(s)	2	1	1	1	1	3	3	1	-	-

Critical Values in parentheses at 5 per cent level. (For ADF test at levels, see McKinnon, 1990).
Lag length determined using the AIC.

Since a drift is significant (see the row for φ_1) and the trend is not significant (see the row for φ_3) for most variables in levels, the first difference ADF statistics reported are those for the presence of constant but without trend.

Since all the revenue-expenditure variables are I(1) processes (with the exception of STEXP and STREC), the Johansen technique is used to determine if a cointegrating relationship exists for the following revenue-expenditure pairs: (i) LTEXP-LTREC (ii) LTEXP-LTR (iii) LTE2-LTREC (iv) LREXP-LRREC (v) LDE-LTREC and (vi) LNDE-LTREC. The lag length in the cointegrating regression from which the lag structure for the ECM model can be inferred is also determined using the AIC.

Table 2. Results of Johansen's Cointegration Test

Variable (1)	LTEXP-LTREC (2)	LTEXP-LTR (3)	LTE2-LTREC (4)	LREXP-LRREC (5)	LDE-LTREC (6)	LNDE-LTREC (7)
EXP	1.00	1.00	1.00	1.00	1.00	1.00
REV	-0.9882	-0.9975	-0.9414	-1.08879	-1.1793	-1.0617
	(-138.10)	(-92.24)	(-78.23)	(-94.49)	(-35.60)	(-103.38)
Constant	-0.1896	-0.8729	-0.2457	0.7382	2.7161	1.3377
Lags	2	2	2	2	2	2
Trace Stat	14.05*	21.60#	15.36*	7.75	16.01**	27.82#
Max Eigen Stat	13.33*	21.42#	13.73*	7.74	14.46**	27.52#

Indicates significance at # 1%, ** 5% and * 10%;
't' values in parentheses; Expenditure is the normalizing variable in the co-integrating regression;
Lag length determined using AIC.

Results of Johansen's cointegration test - Table 2 - reveal cointegration for five of the six pairs of revenue and expenditure, except for revenue expenditure - revenue receipts.

In terms of the above model, lack of cointegration implies that no long run equilibrium exists between the paired variables and that they can wander arbitrarily far away from each other. However, if the variables are cointegrated, the variables cannot move independently of each other. Hence, to illustrate our result with total receipts and total expenditures, the cointegrating regression that was estimated was of the following form: $ltexp_t = c + b\ ltrec_t + e_t$. Since both $ltexp_t$ and $ltrec_t$ are I(1), each of these variables can wander without any tendency to return to long run equilibrium level. However, since $ltexp_t$ and $ltrec_t$ are cointegrated then there exists a linear combination of these nonstationary variables that is stationary. Solving for the error term, we can write the equation as: $e_t = ltexp_t - b\ ltrec_t - c$. Since e_t must be stationary, the linear combination of integrated variables must also be stationary. Hence, we can infer for the total receipts-total expenditures case that while in the short run though, total receipts and total expenditures can deviate from one another. These deviations must be temporary and in the long run total expenditures must be in some fixed linear relation with total receipts.[7] Likewise, we can explain for the other revenue-expenditure pairs as well.

Bivariate VECM models are, then, estimated for these five pairs of revenue and expenditure, and examined for Granger causality using the Block Exogeneity test. As regards revenue expenditure-revenue receipts, in the absence of a cointegrating relation, a bivariate VAR model is estimated and causality inferred therefrom. Further, since the variables STEXP and STREC are stationary in levels, the causal relation between these variables is inferred by conducting the standard Granger causality tests.

The Error Correction Model estimated is as under:

$$\Delta E_t = C_0 - \lambda_1(E_{t-1} - \beta R_{t-1}) + \sum_{i=1}^{m} \alpha_i \Delta E_{t-i} + \sum_{i=1}^{n} \theta_i \Delta R_{t-i} + \mu_t \quad \dots(5)$$

$$\Delta R_t = C_1 - \lambda_2(E_{t-1} - \beta R_{t-1}) + \sum_{i=1}^{m} \gamma_i \Delta R_{t-i} + \sum_{i=1}^{n} \delta_i \Delta E_{t-i} + v_t \quad \dots(6)$$

Where, E - expenditure variable, R - receipts variable. C_0 and C_1 are the constants. α_i and θ_i in Equation (5) are the coefficients that indicate causality from past values of expenditure and receipts to expenditures while γ_i and δ_i in Equation (6) are the coefficients that indicate causality from past values of receipts and expenditures to receipts. μ_t and v_t are the uncorrelated error terms and $-\lambda_1(E_{t-1} - \beta R_{t-1})$ and $\lambda_2(E_{t-1} - \beta R_{t-1})$ are the error correction terms in Equations (5) and (6), respectively. If the deviation happened to be positive, such that, $E_{t-1} - \beta R_{t-1} > 0$, then expenditures would decline and revenues would increase. Long run equilibrium is achieved when $E_t = \beta R_{t-1}$. λ_1 and λ_2 are the speed of adjustment parameters. The larger λ_2 is, the greater the response of revenues to the previous period's deviation from long run equilibrium. The error correction term (ECT) is also another channel through which causality can be expressed when receipts and expenditures are cointegrated. The causality tests are conducted with the null hypotheses that $\beta i = \lambda_1 = 0$ in Equation (5) and $\delta_i = \lambda_2 = 0$ in Equation (6). Causality can be inferred with the rejection of the null hypotheses, and this can be done using the t-test for the ECT (λ_1 and λ_2), and either the F test or the Block Exogeneity Wald test (for β_i and δ_i), and would represent the short term causal effects while the coefficient of the ECT would indicate the long run causal relation.

Table 3. Results of Causality and Error Correction

Null: Revenues do not Granger cause Expenditures LTEXP-LTREC			Null: Expenditures do not Granger cause Revenues LTREC-LTEXP	
	(1)			(2)
ECT_{t-1}	-0.0339 (-0.18)	(1)	ECT_{t-1}	0.5160# (2.78)
χ^2	0.3552 [0.8373]	(1a)	χ^2	2.8371 [0.2421]
LTEXP-LTR			**LTR-LTEXP**	
ECT_{t-1}	-0.2175** (-2.36)	(2)	ECT_{t-1}	0.2401** (2.33)
χ^2	0.8887 [0.6412]	(2a)	χ^2	0.0317 [0.9843]
LTE2-LTREC			**LTREC-LTE2**	
ECT_{t-1}	-0.1238 (-0.86)	(3)	ECT_{t-1}	0.2817# (2.41)
χ^2	0.7389 [0.6911]	(3a)	χ^2	1.7938 [0.4078]
LDE-LTREC			**LTREC-LDE**	
ECT_{t-1}	-0.0058 (0.07)	(4)	ECT_{t-1}	0.1366# (3.71)
χ^2	13.2012# [0.0014]	(4a)	χ^2	6.4591** [0.0396]
LNDE-LTREC			**LTREC-LNDE**	
ECT_{t-1}	-0.5851# (-4.00)	(5)	ECT_{t-1}	0.0558 (0.59)
χ^2	4.1442 [0.1259]	(5a)	χ^2	0.1425 [0.9312]
LREXP-LRREC[1]			**LRREC-LREXP[1]**	
χ^2	11.9259# [0.0026]	(6)	χ^2	1.0696 [0.5858]
STEXP-STREC[2]			**STREC-STEXP[2]**	
F Test	0.4946 [0.4854]	(7)	F test	0.8215 [0.3695]

Notes: Figures in ( ) parentheses indicate 't' values;
Figures in [ ] parentheses probability values;
Indicates significance at # 1%, ** 5% and * 10 %;
1 causality results from VAR model;
2 causality results from standard Granger causality test.

Table 3 (Rows 1 to 5a) present the results for the bivariate VECM models while Rows 6 and 7 present the results of Granger causality test. As described in Section III. (b), causality in a cointegrated system can be inferred by looking at the significance of the ECT (Rows 1,2,3, 4 and 5) as well as the χ^2 statistic (Rows 1a,2a, 3a,4a and 5a). Further, the ECT also suggests the existence of a long term causal relation between the two variables while the χ^2 statistics indicates the short term causal relation. The χ^2 statistic represents the null hypotheses that $\beta_i = 0$ in Equation (5) and $\delta_i = 0$ in Equation (6) which capture the short run causal movements. As mentioned above rejection of the null would imply the prevalence of a causal relation between corresponding categories of revenues and expenditures. Column (1) of Table 3 indicates causality from revenues to expenditures while Column (2) indicates that causality proceeds from expenditures to revenues. The results of the VECM, thus, indicate the prevalence of uni-directional long term causal movements from expenditures to revenues for total expenditures-total receipts (LTEXP-LTREC) and adjusted total expenditures - total receipts (LTE2-LTREC) (Rows 1 and 3). For the total revenues-total expenditures pair (Row 1, Table 3), the one period lagged error correction term measures budgetary disequilibrium, and we find that the error correction term is significant and positive in the revenue equation - Equation 6 - which means that expenditures cause revenues and that revenues move to restore equilibrium. The coefficient of 0.5160 would thus indicate that 51.60 per cent of the budgetary disequilibrium is corrected within one year. Likewise, for total revenues and adjusted total expenditures (Row 3, Table 3), the error correction term is positive and significant in the revenue equation and indicates causality from expenditures to revenues, and that total receipts would rise to correct the disequilibrium. The coefficient of 0.2817 would imply that total receipts would adjust by 28.17 per cent

within one year to correct the disequilibrium between adjusted total expenditures and total revenues. Similarly for total receipts and developmental expenditure, the error correction term is positive and significant in the revenue equation indicating that expenditures cause revenues. With a coefficient of 0.1366 on the error correction term, it would indicate that total receipts would increase by just 13.66 per cent to increases in developmental expenditure. The positive co-efficient of the ECT (Equation 6) for each of these pairs would indicate the extent by which revenues would increase in the next time period so as to correct the deviation of revenues and expenditures in the current period from their long run relationship. Accordingly, for our Error Correction Models for total receipts-total expenditures, total receipts would rise by 51.6 per cent *vis-à-vis* total expenditure, 28.17 per cent for adjusted profile of expenditures and 13.7 per cent *vis-à-vis* increases in developmental expenditure. Significant bi-directional causality or feedback relation is seen for total receipts and developmental expenditure (Row 3a, Table 3). Further, for total receipts and development expenditure, long term causal effects from expenditures to revenues are observed through the significance of the ECT as well (Row 3, Table 3), and hence suggest of a stronger causal effect from expenditures to revenues and that total revenues would adjust rather slowly - over more than seven years (a coefficient of 0.13 for the ECT in the error correction model with annual data). Long run uni-directional causality from total receipts to non-developmental expenditures is observed (Row 5, Table 3), and the coefficient of 0.59 for ECT in the error correction model with annual data would suggest that non-developmental expenditures would adjust in 1.7 years to increases in total receipts.

Further, a long run feedback relation is observed between tax receipts and total expenditures (Row 2, Table 3). The coefficients of ECT suggest that tax receipts will increase by 24 per cent while total expenditures will show a downward adjustment of about 21.75 per cent. Also, the adjustment of total expenditure to tax receipts would take about 4.5 years (a coefficient of 0.22 for a model with annual data).

Empirical evidence, therefore, on the pattern of revenue-expenditure inter-relationship is mixed. Results of the VECM support the existence of long run causal relation from expenditures (total, adjusted and developmental expenditures) to receipts, indicating thereby that expenditure increases precede the increases in revenues and, in a sense, support r the spend and tax hypothesis. The significant bi-directional causality for tax receipts and total expenditures could imply that increased tax revenues encourage the government to increase its expenditure, and then as the difference between tax receipts and total expenditures is growing, probably the Friedman view appears to hold, and governments tend to spend as much as they have and more. However, bi-directional causality could also imply that increased expenditures cause tax collections to increase. However, it is necessary to add a caveat here that tax collections may also increase because of the expansionary effect of government expenditure and it may or may not necessarily imply intentional government action.

Causal effects for the revenue receipts-revenue expenditure pair was uni-directional and revenue receipts lead revenue expenditure, thus implying that rising revenue/current receipts can influence the government to have higher revenue/current expenditure. Government saving/dis-saving is represented by the revenue deficit and since the revenue deficit has been rising, it is clear that, in fact, revenue expenditures

have increased more than the increase in revenue receipts. As far as structural expenditures and structural receipts are concerned, no causal effects are observed between them.. The causality observed between the different categories of expenditure and total revenues are alone not sufficient to indicate what would happen to deficits as a consequence of increases in receipts or expenditures. One way to examine the effects of revenues/ expenditures on deficits would be to look at the uni-directional causality between revenues/expenditures and deficits. Estimating a causal relation between revenue receipts/revenue expenditures and revenue deficits (RD), and total revenues/total expenditures and gross fiscal deficit (GFD) will help understand the impact of revenues/expenditures on the deficit. Further, since revenue receipts, which comprise both tax and non-tax revenues, are the major sources of government revenues and changes in these can influence the level of the gross fiscal deficit, we also estimate a causal relation between revenue receipts and gross fiscal deficits. As revenue deficits are evident from 1979-80, the sample period for the causality analysis between revenue receipts/revenue expenditures and revenue deficits is de-limited to only from 1979-80 to 2003-04 while that for total receipts/total expenditures/revenue receipts and gross fiscal deficits is for 1950-51 to 2003-04. Further, all variables are considered in logarithms. Table 4 presents the results of the unit root tests (in Part A of the Table) and uni-directional causality between revenues/expenditures and deficits (in Part B of the Table). Since all the variables are I(1) processes, the causality test is conducted with the first differences of variables. The results of the causality tests indicate that a causal relation is evident only between revenue receipts and revenue deficits (Row 2, Part B, Table 4) where revenue receipts Granger-cause revenue deficits. This, in a sense, reinforces the result of Table 3 where the causality is from revenue receipts to

revenue expenditures. No causal relation, however, is observed between total expenditures/ total receipts/ revenue receipts and gross fiscal deficits.

Table 4. Results of Unit Root Tests and Causality between Revenues/Expenditures and Deficits

A: Unit Root Tests
ADF Test (Levels)

	LRD	LREXP	LRREC	LGFD
τ_T	-3.1377 (-3.41)	-0.7503 (-3.41)	-0.9965 (-3.41)	-1.7371 (-3.41)
$\varphi3$	4.7337 (6.25)	2.2725 (6.25)	3.1894 (6.25)	5.5319 (6.25)
$\varphi1$	4.9585 (4.59)	5.4047 (4.59)	18.888 (4.59)	8.7948 (4.59)
τ_μ	-0.9226 (-2.86)	-2.0707 (-2.86)	-2.3921 (-2.86)	-0.4833 (-2.86)
Lags	1	2	2	1

ADF Test (First Differences)

	LRD	LREXP	LRREC	LGFD
τ_μ	-4.6953 (-2.86)	-2.9780 (-2.86)	-5.1896 (-2.86)	-3.6030 (-2.86)
Lags	1	1	1	2

B: Results of Causality

	Null Hypothesis	X^2	Outcome
1.	Revenue Expenditures do not cause Revenue Deficits	4.2574 [0.1190]	Accept Null
2.	Revenue Receipts do not Granger cause Revenue Deficits	5.2337** [0.0730]	Reject Null
3.	Total Expenditures do not Granger cause Gross Fiscal Deficits	0.2809 [0.5961]	Accept Null
4.	Total Receipts do not Granger cause Gross Fiscal Deficits	2.6502 [0.1035]	Accept Null
5.[@]	Revenue Receipts do not Granger cause Gross Fiscal Deficit	2.6502 [0.1099]	Accept Null

Notes: @ Sample 1951-2004; Figures in ( ) parentheses in Part A indicate Critical Values at 5 per cent level of significance; Figures in [ ] parentheses in Part B indicate probability values.

V. CONCLUSION

The paper seeks to examine whether there exists interdependence between total receipts/tax receipts and a wide array of expenditure measures of the central government. Interdependence, if any, between revenues and expenditures could probably provide an insight as to why it might be difficult for the government to be able to adhere to the fiscal responsibility rules, and *may* also explain growing government deficits. The empirical evidence in this paper finds no uniform pattern to the causal relationship between the total receipts/tax revenue and the different categories of expenditures. The evidence finds support both, for the tax and spend hypothesis and for the spend and tax hypothesis. Lack of causal relation or causal independence is evident between the structural components of expenditure and those of receipts. Further, both long run as well as short run causal effects are observed between revenues and expenditures. A long run causal relation of expenditures leading revenues is observed for total receipts and total expenditures, total receipts and total expenditures adjusted for defence and interest payments, and total receipts and development expenditures (three of the five cointegrated pairs) and in a sense supports the spend and tax hypothesis (Proposition (ii) in the Introduction). On the other hand, a long run causal relation from revenues to expenditures is observed for total receipts and non-developmental expenditures, which provides support for the tax and spend hypothesis (Proposition (i) in the Introduction). Significant long run bi-directional causality is observed between tax receipts and total expenditures

indicating that the government tries to support its growing expenditure by trying to increase tax revenues while at the same time increased tax revenues also spur the government to spend more. Likewise, a significant bi-directional short run causal relation between total receipts and developmental expenditure is observed. The evidence of a causal relation from revenues to expenditures for revenue receipts- revenue expenditures is also significant, implying thus, that rising revenue/current receipts can influence the government to incur higher revenue/current expenditure and thus have an impact on the extent of government dis-saving. The paper analyses the effects of changes in revenues/expenditures on the deficit, estimating a causal relation between revenues/expenditures and deficits. The paper finds a causal relation between revenue receipts and revenue deficits (i.e., revenue receipts Granger-cause revenue deficits) but no causal relation is observed between deficits and total expenditures or total revenues.

It would be important to remember here that the increases in government expenditures and their different components may also lead the government to increase its receipts because the government tries to contain deficits by raising taxes or administered prices or because of increase in aggregate income, output, sales or imports even if the government is passive and does not change its fiscal policy stance. Hence, expenditures Granger-causing revenues is not a decisive test of the spend and tax hypothesis. Likewise, it is also plausible that when the government is planning to increase its expenditure, it may raise taxes and administered prices in anticipation of increased expenditures. This may show up in revenues Granger-causing expenditures, yet the spend and tax hypothesis may not really be rejected because, in reality, increased expenditures may lead the government to increase receipts. Further in so far as, following the literature on the subject, we have not attempted

to adjust the revenues and expenditures to remove their response to GNP and hence the results may be subject to reservation.

Thus, whether we find support for the spend and tax hypothesis - wherein government revenue adjusts with a lag to government expenditure or the tax and spend hypothesis, which supports the Friedman view that 'increasing taxes will simply lead to more government spending', or in other words, as long as there is a causal interdependence between revenues and expenditures, the outcome in both scenarios is that the level of expenditure is higher. Hence, one can then infer that rather than merely having deficit rules (as in FRBM Act, 2003) so as to achieve fiscal stability, it would be useful to have rules for expenditure containment in an effort to have some degree of deficit containment. The paper concerns itself with the interdependence of central government revenue and expenditure. An in-depth and broad based analysis by extending the study to state finances may help in a better understanding of the interdependence between the revenue and expenditure profiles, reflecting government behaviour, and may help in evolving better policies/ rules for government deficit management.

NOTES

1. A budget deficit that remains across the business cycle or that component of deficit that remains unresponsive to cycles in the economy is referred to as structural [Report of the Twelfth Finance Commission, Chap 4, p. 54].

2. Ram [1988] suggests that the link between federal revenue-expenditure causality needs to be viewed in the perspective of how the fiscal authorities perceive federal debt. 'If federal authorities perceive that debt is a part of net private wealth and regard its size to be non-neutral relative to private consumption and saving, they would probably be more inclined to assess the revenue aspect before incurring or committing expenditure. One might then observe causality to run predominantly from revenue to expenditure. However, if federal debt is considered as 'neutral' and there is no fear of debt instability, the causality may be bi-directional or unidirectional from expenditure to revenue'. Further, 'the contrast between causality patterns in the federal and state-local

government sectors could suggest asymmetrical macroeconomic implications of budgetary imbalances in the two sectors'.

3. The GNP gap variable would represent the effect of cyclical change on the budget, and attempts to capture the automatic stabilisation effects that arise from actual changes in the gap, irrespective of the degree to which they have been predicted. Since the average tax rates are constructed with reference to potential GNP, they can vary with such economic developments rather than the chain reaction between taxing and spending. Likewise, the inclusion of the inflation variable is to capture the automatic effects of changes in the inflation rate on the government budget. Significant changes in expected inflation, particularly increases in it, are usually not reflected into the economic assumptions underlying government budgets.

4. See Greene, 2003, p. 850.

5. Suppose we have, $\Delta y_t = a_{10} + \alpha_y (y_{t-1} - \beta z_{t-1}) + \Sigma a_{11}(i)$ $\Delta y_{t-i} + \Sigma a_{12}(i) \Delta z_{t-i} + \varepsilon_{yt}$ (1) and $\Delta z_t = a_{20} + \alpha_z (y_{t-1} - \beta z_{t-1}) + \Sigma a_{21}(i) \Delta y_{t-i} + \Sigma a_{22}(i) \Delta z_{t-i} + \varepsilon_{zt}$ (2), if $\alpha_y = 0$, y_t does not respond to the discrepancy from long run equilibrium and z_t does all the adjustment. In this case, y_t is said to be weakly exogenous [Enders, 2004].

6. Definition of development expenditure is that of the RBI (as in its *Report on Currency and Finance*, 1997) and comprises the following: (a) Social and Community Services - Education, Art, Culture, Scientific Services and Research, Medical, Family Welfare and Public Health, Labour and Employment, Broadcasting, Housing and Urban Development, Other Social and Community services;
(b) Economic Services - Agriculture and Allied Services, Industries and Minerals, Foreign Trade and Export Promotion, Energy, Transport and Communication, Science, Technology and Environment, Rural Development, Other Economic Services (special area programs, irrigation and flood control, general economic services, etc.), Railways, Posts and Telecommunications;
(c) General Services;
(d) Grants-in-aid to States and Union Territories for developmental purposes;
(e) Disbursements of Union Territories.

7. Indeed, they have to be equal in the long run, i.e., we should have b=1 and c=0. However, in the estimated cointegration relationships we did not get b=1 and c=0.

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DATA APPENDIX
Table 1. Major Components of Receipts of the Central Government 1950-51 to 2003-04

(Rs. Crore)

Year	TR	NTR	Rrec	Krec	Trec
(1)	(2)	(3)	(4)	(5)	(6)
1950-51	358	49	406	106	512
1952	460	55	515	212	727
1953	387	48	435	69	504
1954	363	53	416	218	634
1955	399	57	456	273	729
1956	412	70	481	288	769
1957	494	70	563	310	873
1958	575	98	674	298	972
1959	553	117	670	590	1,260
1960	643	136	779	758	1,537
1961	730	147	877	1,156	2,033
1962	875	162	1,037	1,022	2,059
1963	1,061	366	1,428	1,204	2,632
1964	1,374	471	1,846	1,381	3,227
1965	1,563	518	2,081	1,645	3,726
1966	1,785	560	2,320	1,646	3,966
1967	1,934	539	2,473	2,171	4,644
1968	1,937	617	2,554	2,164	4,718
1969	2,020	741	2,760	2,000	4,760
1970	2,201	866	3,028	2,508	5,536
1970-71	2,451	842	3,293	2,046	5,339
1972	2,928	940	3,868	2,504	6,372
1973	3,443	1,080	4,523	2,464	6,987
1974	3,900	1,114	5,014	2,876	7,890
1975	5,097	1,345	6,442	2,774	9,216
1976	6,010	1,854	7,864	4,149	12,013
1977	6,581	1,987	8,568	4,958	13,526
1978	7,060	2,478	9,538	5,035	14,573
1979	8,568	2,406	10,974	6,285	17,259
1980	8,567	2,542	11,109	5,420	16,529
1980-81	9,358	3,015	12,373	7,918	20,291
1982	11,542	3,482	15,024	8,849	23,873
1983	13,017	4,417	17,434	11,701	29,135
1984	15,441	4,270	19,711	14,406	34,117
1985	17,651	5,815	23,466	16,421	39,887

Table 1. *(Concld.)*

(Rs. Crore)

Year (1)	TR (2)	NTR (3)	Rrec (4)	Krec (5)	Trec (6)
1986	21,140	6,895	28,035	19,315	47,350
1987	24,319	8,764	33,083	21,572	54,655
1988	28,015	9,022	37,037	25,408	62,445
1989	33,751	9,840	43,591	29,878	73,469
1990	38,349	13,947	52,296	30,020	82,316
1990-91	42,978	11,976	54,954	38,997	93,951
1992	50,069	15,961	66,030	38,528	1,04,558
1993	54,044	20,084	74,128	36,178	1,10,306
1994	53,449	22,004	75,453	55,440	1,30,893
1995	67,454	23,629	91,083	68,695	1,59,7785
1996	81,939	28,191	1,10,130	58,338	1,68,468
1997	93,701	32,578	1,26,279	61,544	1,87,823
1998	95,672	38,229	1,33,886	99,077	2,32,963
1999	1,04,652	44,833	1,49,485	1,30,064	2,79,549
2000	1,28,271	53,211	1,81,482	1,15,707	2,97,189
2000-01	1,36,658	55,947	1,92,605	1,34,184	3,26,789
2002	1,33,532	67,774	2,01,306	1,62,500	3,63,806
2003	1,58,544	72,290	2,30,834	1,80,531	4,11,365
2004	1,86,982	76,831	2,63,813	2,11,333	4,75,146

Notes:

TR Tax Revenue (Direct + Indirect tax revenue);

NTR Non Tax Revenue;

Rrec Revenue Receipts (Tax Revenue + Non Tax Revenue);

Krec -- Capital Receipts;

Trec Total Receipts (Revenue + Capital Receipts).

Source: Reserve Bank of India, *Report on Currency and Finance,* (various issues).

Reserve Bank of India, *Handbook of Statistics,* (various years).

Table 2. Major Components of Expenditure of the Central Government 1950-51 to 2003-04

(Rs. Crore)

Year (1)	Rexp (2)	Kexp (3)	Texp (4)	Def (5)	Intp (6)	DE (7)	NDE (8)
1950-51	347	169	516	168	37	97	305
1952	387	296	683	181	39	98	384
1953	396	172	568	186	37	74	333
1954	407	308	715	196	41	98	301
1955	423	448	871	196	40	148	390
1956	441	488	929	190	43	218	314
1957	471	584	1,055	210	39	341	380
1958	631	798	1,429	280	42	502	516
1959	675	807	1,482	279	49	542	490
1960	736	970	1,706	267	69	401	625
1961	826	1,090	1,916	281	77	526	628
1962	912	1,262	2,174	312	83	695	1,036
1963	1,314	1,474	2,788	474	245	793	1,449
1964	1,659	1,735	3,394	816	278	834	1,650
1965	1,807	2,091	3,898	806	316	814	1,639

(Contd.)

Table 2. *(Concld.)*

(Rs. Crore)

Year (1)	Rexp (2)	Kexp (3)	Texp (4)	Def (5)	Intp (6)	DE (7)	NDE (8)
1966	2,001	2,139	4,140	885	371	789	2,346
1967	2,244	2,694	4,938	909	463 ·	748	2,045
1968	2,450	2,475	4,925	968	501	817	1,755
1969	2,679	2,344	5,023	1,033	528	1,318	2,272
1970	2,942	2,179	5,121	1,101	565	1,477	2,643
1970-71	3,130	2,494	5,624	1,200	606	2,371	3,196
1972	3,968	2,924	6,892	1,526	670	2,506	3,338
1973	4,538	3,319	7,857	1,652	776	3,177	4,246
1974	4,777	3,441	8,218	1,681	882	3,946	5,494
1975	5,677	4,259	9,936	2,112	1,001	4,710	5,601
1976	6,978	5,401	12,379	2,472	1,228	5,615	5,990
1977	8,270	5,387	13,657	2,562	1,488	6,400	6,965
1978	9,108	6,398	15,506	2,634	1,646	7,183	7,291
1979	10,682	8,084	18,766	2,868	1,984	8,665	9,862
1980	11,803	7,159	18,962	3,356	2,292	10,311	9,855
1980-81	14,410	8,358	22,768	3,604	2,604	13,327	9,867
1982	15,408	9,857	25,265	4,329	3,195	13,791	12,644
1983	18,742	12,049	30,791	5,021	3,938	16,333	15,897
1984	22,251	13,283	35,534	5,831	4,795	19,407	18,364
1985	27,691	15,941	43,632	7,061	5,974	27,375	18,525
1986	33,924	18,742	52,666	7,988	7,512	32,909	20,889
1987	40,860	22,056	62,916	10,477	9,246	35,498	26,060
1988	46,174	22,087	68,261	11,968	11,251	36,573	30,261
1989	54,106	25,005	79,111	13,341	14,278	41,536	35,519
1990	64,210	28,698	92,908	14,416	17,757	54,204	41,020
1990-91	73,516	31,782	1,05,298	15,426	21,498	58,645	49,349
1992	82,292	29,122	1,11,414	16,347	26,596	59,313	55,170
1993	92,702	29,916	1,22,618	17,582	31,075	65,479	60,584
1994	1,08,169	33,684	1,41,853	21,845	36,741	72,464	73,586
1995	1,22,112	38,627	1,60,739	23,245	44,060	82,803	82,402
1996	1,39,861	38,414	1,78,275	26,856	50,045	84,427	98,632
1997	1,58,933	42,074	2,01,007	29,505	59,478	94,197	1,12,217
1998	1,80,335	51,718	2,32,053	35,278	65,637	1,10,994	1,27,820
1999	2,16,461	62,879	2,79,340	39,897	77,882	1,37,257	1,50,298
2000	2,49,078	48,975	2,98,053	47,071	90,249	1,29,151	1,77,928
2000-01	2,77,839	47,753	3,25,592	49,712	99,314	1,39,386	1,97,470
2002	3,01,468	60,842	3,62,310	54,266	1,07,460	1,59,364	2,15,456
2003	3,38,713	74,535	4,13,248	55,662	1,17,804	1,84,197	2,42,749
2004	3,62,074	1,09,129	4,71,203	60,300	1,24,555	1,95,428	2,43,298

Notes:

Rexp Revenue Expenditure

Kexp Capital Expenditure

Texp Total Expenditure (Revenue + Capital Expenditure)

Def Defence Expenditure (revenue + capital account)

Intp Interest payments

DE Developmental Expenditure

NDE Non- Developmental Expenditure

Sources: Reserve Bank of India, Report on Currency and Finance (various issues);

Reserve Bank of India, Handbook of Statistics, (various years).

EXCHANGE RATE, PRODUCTIVITY AND EXPORTS: THE CASE OF INDIAN TEXTILE SECTOR

Badri Narayanan G.

Indian textile and apparel exports contribute to around 25 per cent of the total Indian exports. In this paper, we examine the effects of currency appreciation and productivity on Indian textile and apparel exports, since these are crucial in this sector in the light of the phasing out of Multi Fibre Arrangement (MFA) quotas by 2005. Based on a cointegration and causality analysis of data from 1960 to 2000, the existence of cointegration among the exchange rate, export prices, exports, productivity, and imports of machinery, has been tested. These were found to be not cointegrated by Johansen's Full Information Maximum Likelihood (FIML) test [1988]. However, cointegration was found to exist between textile exports and exchange rate, and also between textile exports and their prices, implying a long run equilibrium relationship between textile exports and exchange rate, and also between textile exports and their prices. Granger [1981, Pp. 121-30] causality tests show that prices strongly Granger-cause textile exports, while there is a long run causal adjustment between exports and exchange rate. Impulse response functions, and prediction error variance decomposition do indicate a role of productivity in influencing textile exports. The conclusion is that exchange rate plays a clearly vital role in textile exports, while the role of productivity is not so clearly established in this study, as no cointegration or causality was found between productivity and exports, though it does seem to have an impact on future exports.

I. INTRODUCTION

The persistent appreciation of the Indian currency in the past had caused anxiety among the exporters, since their export revenue in terms of Indian currency could be expected to fall drastically with this (See, for example, Ghose, Lahiri, and Wadhwa [1986, Pp. 247-62]). It might also affect the players in the domestic market through the increased competition from the relatively cheaper imports. However, a few experts argue that appreciation would not have adverse negative effect on the exports (See, for example, the literature reviewed in Pagoulatos [1986, Pp. 441-42]), while it may be argued that this would rather reduce the dependence of exports on 'artificial competitive advantage' arising out of the control of currency appreciation by the central bank, thereby forcing the producers to bring about an improvement in the quality of production, so as to ensure that the goods are sold despite a currency-induced rise in price.

Another argument on the same lines is that the upward pressure on the prices and the resultant downward pressure on the exports might force the exporters to reduce the costs by improving productivity. The possible currency-induced fall in import prices might encourage the imports of more energy-efficient and cost-efficient imported machinery, which in turn, could add to the productivity growth and marginal cost reduction [Athukorala and Menon, 1994, Pp. 271-81]. Hence, the appreciation of currency could result in long run benefits of enhanced efficiency, productivity and quality of commodities.

For the aforementioned arguments to be empirically tested, a comprehensive multivariate time-series analysis is required. Further, analysis based on any aggregate time series data would not be very meaningful owing to the heterogeneity of the different sectors involved in exports in terms of degree of industry competition, product substitutability, and relative domestic and foreign

market shares. Hence, in this study, the Indian textile exports, which contribute to around 25 per cent of the total Indian exports, have been considered since the effects of currency appreciation and productivity are crucial in this sector in the light of the phasing out of Multi Fibre Arrangement (MFA) quotas by 2005.[1] As shown in Figure 1, the Indian textile exports had been almost stagnant until the mid 1980s, after which they started rising sharply, probably because of the deregulation of the textile sector in the late 1970s

and early 1980s. In this period, licensing procedures to start new enterprises were simplified. Hence, the entry into the industry was effectively deregulated, limits on capacity expansion on individual lines of production were replaced by limits on aggregate production of textile mills, and the upper limits in mill output were relaxed as well as the liberalisation in the early 1990s, especially the economic reforms, were introduced in 1991. However, whether this rising trend would continue is uncertain, due to the aforesaid reasons.

Figure 1. Textile Exports from India: 1960-2000
(realtex: Real Textile Exports in 1968 prices[2])

(Rs lakh)
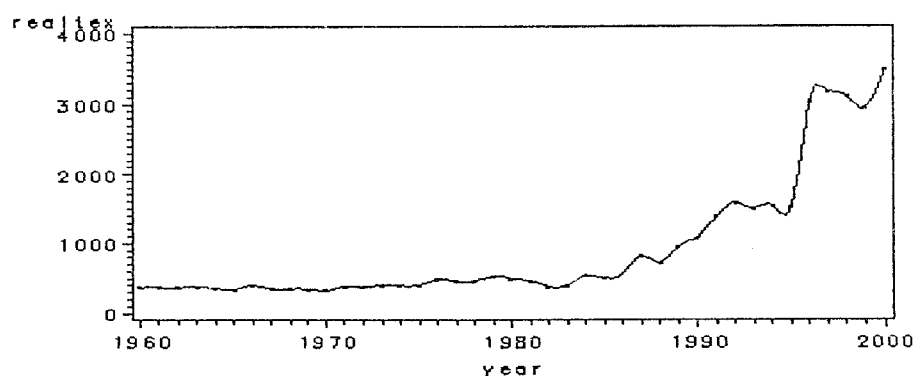
The Indian textile sector, as considered in this study, includes spinning that involves producing yarn from fibres, weaving that involves manufacturing fabric from the yarns, and processing that involves chemical treatment and colouration of yarns and fabrics for durability as well as aesthetics, and clothing sector that includes the processes that result in the manufacture of readymade garments from fabrics. This is the second largest employer in India after agriculture, with more than 35 million persons engaged in it. It contributes five per cent to the Gross Domestic Product (GDP) of the country, 25 per cent to the

total exports of India; and 20 per cent to our industrial production.[3] Textile industry is very significant for the Indian economy, by virtue of being among the earliest established industries in the country, and being the key sector responsible for rapid growth of the newly industrialised countries, in addition to the facts and figures listed above. While cotton, wool, silk, and jute are the natural fibres that are prominent in Indian textiles, synthetic fibres, such as viscose, nylon, polyester, acrylics, polypropylene, and acetate fibres have been increasingly gaining importance. The clothing sector again involves as many different

fibres as there are in the textile sector. Since both of these are quite interlinked and interdependent, they could be studied as an aggregate textile industry, as done in this study. The implicit assumption of this study, then, would be that all the different sub-sectors of textiles operate, on an average, in similar ways. This is not a strong assumption in the Indian case, as textile industry is distinctly perceived in the role of operating as a single huge entity in Indian economy. Another related and more crucial assumption is the constancy or the stability of these relative prices, which is required for the aggregation of the outputs of the sub-sectors. However, similar to various studies that aggregate exports over various sectors of the economy to obtain a macroeconomic outlook, this aggregation needs to be done not only for an overview of the textile sector, but also due to the lack of availability of comparable and consistent time-series of sub-sectorwise data.

Strong and diverse raw material base, cheap labour, ever-growing domestic market, and relatively better technologies than those in other developing countries are the key strengths of the Indian textile sector that have resulted in such a pronounced prominence of this industry. Development of modern textile industry in India gained momentum soon after it had done so in Britain, owing to the availability of indigenous cotton, cheap labour, access to British machinery, and a well-developed mercantile tradition in India.

The co-existence of a broad spectrum of production techniques, a distinct trend towards decentralised manufacture in the informal sector, sustained, albeit considerably declined, predominance of cotton as the raw material, a very huge sick public sector, the recent trend towards adopting modern techniques in the manufacture of textiles, mostly domestic-oriented textile sector, mostly export-oriented clothing sector, and

the existence of quite a few distorting regulations, such as hank-yarn obligations and tariff structure, favouring natural fibres and conventional means of production, are some the fundamental features of the Indian textile and clothing industry in brief (See, for example, Misra [1993] and Sastry [1984] for detailed studies on the Indian textile sector).

Manufacturing of clothing in the unorganised sector has been growing rapidly. In the unorganised sector, the working conditions are not satisfactory, as the labour regulations cannot be enforced and a hire-and-fire principle is in place. For example, there are no stipulated working hours, and the workers, especially children and women, are exploited. This is true even in a part of the organised sector, wherein the manufacturers recruit contract labourers in order to minimise the losses that they are facing, due to the inflexible labour regulations that stop them from firing their 'permanent' employees even during recessions. In fact, Roy [1998] observes a rapid growth of the informal sector in the textile industry, especially after the reforms of 1991.

Given this mixed structure of the Indian textile sector, the effects of appreciation of exchange rate may not be straightforward. First, as a standard economics textbook would suggest, exchange rate appreciation reduces the volume of exports. Second, the unorganised nature of a major part of textiles may ensure that the adverse effects of appreciation may be shielded due to the flexibility in operation. For example, to reduce labour costs, the workers may be exploited overtime for same wages. Third, with the existence of MFA quotas, the response to exchange rate could be distorted in this period, as the export volume, reduced to some extent owing to appreciation, might be lower with quotas than without them, though the downward response to appreciation may not be lower even when quotas are binding. With a

higher degree of certainty, the upward response of exports to depreciation would be lower in a quota-regime.

Despite being one among the leaders in textile production in the 1950s, and the fact that India has a self-reliant value chain of textiles, India has been steadily receding from the world textile market, with a loss of importance in industrialisation at home also. The decline of the Indian textile industry is very conspicuous with respect to other industries as well as textile industries of the other countries in the developing world, as is evident from a steep fall in the share of Indian textiles in the international market, from around 15 per cent in the 1950s to less than two per cent in the 1990s, and that in the total Indian exports, from around 40 per cent in the 1950s to 25 per cent in the 1990s (See Misra [1993] for an elaborate analysis of this issue). The major reason for this could be the distorting nature of various regulations. Box 1 illustrates some major policy events in the Indian textile and apparel sector.

Box No. 1. Major Policy Developments pertaining to Indian Textile and Apparel Sector

Policy Event (1)	Year (2)
Reservation of some products under handlooms	1950
Cess on mill cloth	1952
Kanungo Committee favoring power looms over handlooms for efficiency	1952
Karve Committee: Freezing mill output except for exports	1955
Asoka Mehta Committee: Promoting powerloooms	1964
Establishment of National Textile Corporation	1968
Setting up of Cotton Corporation of India (CCI) to control cotton prices	1971
B. Sivaraman's Study Team: benefits meant for handlooms are reaped by powerlooms	1974
Removal of excise duties for hank yarns for handlooms	1975
Soft Loan Scheme	1975
Freezing of powerloom output to existing levels	1978
Removal of price control for cloth	1978
Abandoning of CCI and its buffer stock operations (except in Maharashtra)	1981
Textile Policy: Many reforms favouring mill sector, powerlooms, and non-cotton textiles	1985
Technical Upgradation Fund Scheme (TUFS) and deregulation	1991
Dereservation of Garment sector from Small-Scale Industries sector	2000
Phasing out of MFA quotas 2005	2005

Note: This table was prepared based on studies such as Misra [1993] and Sastry [1984] and based on author's knowledge of these events.

A wide range of regulations in the textile industry, involving bureaucratic difficulties in the expansion of the industry and highly distorted tariff structure, were partly responsible for this steady recession. For example, hank yarn obligation requires the spinners to allocate a fixed and substantial part of their production to hand-loom weavers. It came into place in 1974; it was fixed at 50 per cent of the total marketable yarn in 1986, though it was brought down to 40 per cent, and then 20 per cent in 2003.[4] This not only restricts the profits of spinners, but also the raw material access and cost for the weavers and others up the value chain. The reservation of garment sector under the 'Small Scale Industry', which was in place till 2000, had restricted large scale investment in this sector, which has resulted in a huge loss in efficiency that could have been otherwise achieved by exploiting the economies of scale. Moreover, the Ministry of Environment and Forests demands proper treatment of certain chemicals used mainly in the processing of textiles, through the Environment (Protection) Act [1987]. In addition to the domestic regulations, the industry has also been facing import restrictions from the developed countries. For example, the US imports from Asia are being highly constrained by the quotas based on the Multi Fibre Arrangement (MFA), as shown by Evans and Harrigan [2004].

The objective of this study, given the background of textile sector described above, is to examine some fundamental and interesting questions: What matters for the value of textile exports in the long run: exchange rate or productivity or both? How do the exports, their prices, and the variables representing the production structure of this industry change together over time?

The existence of cointegration, i.e., a long run relationship, between the exchange rate, export prices, exports, productivity, imports of machinery, production costs and domestic prices of the importing countries, is tested in this paper. As explained in a later section in this paper, A series is said to be I(1) if it is integrated of order 1, i.e., the variable's current value very much depends on its past ones. If it is I(2), even its current growth depends on its past growth. A Vector Auto Regression (VAR) model is developed with the first five of these variables, which are I(1), and found to be not cointegrated by Johansen's FIML [Full Information Maximum Likelihood] test [1988, Pp. 231-54], while the other two are I(2), therefore not included in the cointegration analysis. However, cointegration was found to exist between textile exports and exchange rate and also between textile exports and their prices. Hence, we conclude that textile exports have a long run relationship with exchange rates and export prices. Granger [1981, Pp. 121-30] causality tests show that export prices strongly Granger-cause textile exports, while there is a long run causal adjustment between exports and exchange rate. This means that export prices cause exports, while the long run relationship between exports and exchange rate is maintained by means of causal adjustment of exports through exchange rate. For example, when the exports are at a level that is not consistent with the long run relationship with exchange rate, they adjust themselves in such a way that the new level is consistent with their long run relationship.

Section II of this paper reviews the literature used for this study. Section III elucidates the theoretical arguments involved in the study. Section IV explains econometric theory and methodology adopted. Section V shows the results, and the conclusions are drawn in Section VI.

II. LITERATURE REVIEW

Doyle [2004, Pp, 443-55] measures the exchange rate pass-through[5] in the Anglo-Irish case, based on the co-integration and error-correction modelling of the Irish Pound price of its imports from England, its production costs in Sterling, domestic prices of the competing products, and the exchange rate in Irish Pounds per Sterling for all the quarters between 1979 and 1995. He finds a full pass-through from the exchange rate and sectoral export unit values, implying no role for domestic competing prices in explaining the long run relationship determining unit values of Irish imports from the UK.

Menon's [1996, Pp. 434-44] mark- up model defines the exchange rate pass-through as the degree to which changes in the exchange rates are reflected in the destination currency prices of the traded goods. Athukorala and Menon [1995, Pp. 533-46] attribute the incomplete pass-through to the strategic pricing behaviour or 'pricing to market', which is the exchange rate-induced price discrimination[6] in the international markets. For example, the difference in exchange rates between two countries might explain a major part of price differences of the exports to these two countries, rather than the cost-side factors alone. They also postulate the shifts in the marginal cost curve as a reason for the former based on the estimation of an export price equation and an input cost equation to calculate the effect of exchange rates separately on prices and costs. It is reasonable to expect that exchange rates may also differ due to a number of factors, leading to differences in export prices beyond what can be expected or explained through the differences between the costs of production in the exporting countries.

The empirical analysis of the Japanese exports in 1980-92 by Athukorala and Menon [1994, Pp.

271-81] reveal that strategic pricing and cost-lowering effect of the appreciating Yen have caused the incomplete pass-through. In addition to this, Klitgaard [1999, Pp. 41-54] also finds evidence of the ability of Japanese exports to absorb some of the exchange rate effects via the lowering of the profit margins.

The other studies that explain the incomplete exchange rate pass-through include Bhagwati [1988] based on the non-tariff barriers, and Rangan and Lawrence [1993, Pp. 341-69] based on the role of multinational corporations) MNCs in the USA in carrying out intra-firm transactions with 'internal' exchange rates, thereby avoiding unfavourable exchange rate fluctuations.

Another strand of literature pertains to the quantity of exports, such as Balaguer and Cantavella-Jorda [2004, Pp. 473-77] that does the co-integration and causality analysis for exports, share of manufactured exports, and the economic growth in Spain from 1961 to 2000, taking into consideration the export expansion and the shift from the traditional to manufactured exports. This proves that the structural trans-formation in the export composition is a key factor for the Spanish economic development. However, it does not consider the various factors that could have affected the exports, such as export prices and exchange rates.

Salehi-Isfahani [1989, Pp. 495-512] examines the relationship between the then declining oil exports, real exchange rate appreciation and import demand in Nigeria, in order to answer the questions of the extent to which growth has to be lowered owing to the Balance of Payments crisis, and the feasibility of real devaluation as a remedy to this problem. As oil prices are exogenous, any change in exchange rate would affect the imports significantly. Hence, he estimates the import demand function by a simple linear regression,

which exhibits elasticity with respect to price, but none with respect to income. This study gives a framework for the inclusion of imports in the current analysis.

Ghose, Lahiri, and Wadhwa [1986, Pp. 247-62] consider that the Indian imports are so much restricted by the government intervention that the actual imports equal the level desired by the government, implying its exogeneity. Their import demand equations capture government's decision based on the basis of its foreign exchange reserves and expected inflows. However, the competition between the different sectors for the scarce foreign exchange restricts the role for the government to merely prioritise the distribution of the reserves giving more room to the income and prices to determine the demand for imports. They estimate the import demand functions for petroleum, mineral fuels and lubricants and manufactured products to be dependent on their prices, foreign exchange reserves and net excess demand.

Gokhale and Katti [1995] give a description of structure of international trade in textiles and its implications for India. A few of the subsequent paragraphs are based on this study. After World War II, there were many Bilateral Trade Agreements among countries, until 1961, when a regulatory framework named Short-Term Agreement (STA), was signed by General Agreement on Trade and Tariff (GATT) member countries. This was replaced by Long-Term Agreement (LTA) since 1962, which imposed controls on exports of cotton textiles, and exports to the developed countries from the developing ones.

The Multi Fibre Arrangement (MFA) came into force in 1974 to exercise controls and restrictions over imports of non-cotton textiles as well. The first stage of MFA, which was until 1977, promised increase in export earnings for developing countries, with due consideration of market disruption that might occur owing to excessive imports to the developed countries. In such cases, the developed countries were empowered to restrain the levels of exports, based on the past exports, allowing for some positive growth rates as well. These could be done by bilateral consultations and these did apply for handlooms. The second stage of MFA was from 1978 to 1981, and was more restrictive than the first one, as it allowed reasonable but temporary departures from the general terms of MFA. As the departures were mostly restrictions and were of continuing nature, this was detrimental to the export performance of the developing countries. The third stage of MFA, which was from 1982 to 1986, was supposed to be less restrictive as it gave more provisions to the developing countries to be compensated for the safeguard measures. Textiles and apparel sectors were treated as two distinct sectors and quotas were worked put accordingly. However, this worsened the situation as regards Indian textile and apparel exports, as most bilateral agreements signed consisted of rigid restrictions on category ceilings, growth rates, carry over, carry forward and swing provisions.

During its last stage [1987-2005], there was increasing resentment across the world against the MFA, since it had allowed the developed countries to export among themselves without restrictions, and to safeguard against all the low-price exports. Even the consumers of developed countries have been increasingly becoming more cautious and concerned about the social norms, such as the conditions of labour, and the environmental degradation arising from production. These may act as hurdles for India's textile export performance in the future.

All the changes and developments that were happening in Indian textile exports were not so pronounced to cause structural changes, atleast in the period 1960 to 2000, which is the period of this study. This is primarily because of the fact that, as described in the previous paragraphs, this period is characterized by restrictive trade regime in textiles, despite the commencement of phasing out of quotas in 1995. Thus, studying India's textile exports during a restrictive period of 1960-2000 could be done without incorporating these changes explicitly in the econometric analysis. Nevertheless, inclusion of time dummies does take care of controlling for the effects of these changes to a large extent.

III. THEORY

This study follows a modification of Menon's [1996, Pp. 434-44] approach in the sense that we apply the theory, which is meant for the pass-through of the exchange rate to import prices in a framework that captures the pass-through of the exchange rate to the export prices.

Let the export price index constructed from the prices in rupees be PX, the production cost index based on Rupee values be CP.[7] If the mark-up is μ and the exchange rate is *ER*, then:

$$PX = \mu.CP \qquad \qquad ... (1)$$

Let the mark-up be defined as βth power of the ratio of the domestic price index of the import-competing goods in the importing countries, based on prices measured in rupees to the production cost.

$$\mu = (PD.ER/CP)^\beta \qquad \qquad ... (2)$$

where
PD is the domestic price index of the importing

country based on prices measured in its currency. *ER* is the exchange rate in terms of Rupees/Foreign Currency.

The rationale for this equation is that market power of the exporting country, in terms of ability to set the prices of the good, is dependent on or may be proxied by the extent to which the domestic price of that good in the importing country, which is

(PD. ER) in terms of Rupees is higher than its production cost in India *(CP)*. Further, we also assume in this equation that this ratio need not be the mark-up as such, and hence β comes into picture: For example, if β = 0, mark-up is unity irrespective what *PD*, *ER* and *CP* are. Hence, by substituting (2) in (1), we get:

$$PX = (PD.ER/CP)^\beta .CP \qquad \qquad ... (3)$$

Taking logarithms and adding the other terms that are expected to have an impact on the export prices based on theory, we have the following specification for the export prices, representing the logarithms of the variables defined so far in their lower case:

$$px = f(pd, er, cp, exp, imp, prody) \qquad ... (4)$$

where
     exp is ln(value of exports)

     imp is ln(import price index of the goods that are most likely to affect the cost and prices of the textile exports, namely, textile machineries); and

     prody is ln(productivity of the domestic sector that produces the exports).

Positive signs could be expected for pd and cp, since the increase in the domestic price would encourage the exporters to increase their prices,

and the increase in the production cost would cause an upward pressure on the prices. Hence, there is no implicit assumption on the market structure, in the sense that export prices are defined as a function of both, internal and external, variables. For example, if the internal variables, such as cp and prody, are significant, we may say that exporters have some control over prices, while it is not necessarily so otherwise.

The import of certain goods, which are highly sensitive to their prices, may reduce the marginal cost of production of the exports. A good example for this is the imported textile machinery, which is, in general, more productive than Indian machines and hence reduces the marginal costs. To the extent that this argument holds true, imp is likely to have a positive effect on px. It is true that explicit incorporation of tariff structure of machinery imports could have been a much more rigorous exercise. However, this is not attempted here, since such a long time-series data for tariff structure is difficult to obtain. The limitation is two-fold: unavailability of time-series data for tariff structure for machineries in all categories in textile sector and difficulty in aggregating the tariff structure for the entire textile sector. However, it should be noted that this is not a serious problem at all, since the variations in he tariff structure are bound to be reflected in the price structure, which is modelled in our analysis through the variable *imp*.

The variable prody is expected to increase the ease of lowering *px*, since higher productivity leads to lower marginal cost, which gets translated into lower prices, given a constant mark up. Higher productivity might also get translated into better quality, leading to higher exports. Hence, *prody* not only explains what is captured in *cp*, but also more information. The classical demand-pull argument (rise in demand due to productivity-induced fall in prices) might predict

a positive sign for exp. With an expansion in textile exports, the industries are being forced to increase their scales in order to enhance their productivity levels by modernising and enhancing the efficiency of their employees, resulting in lower costs, which can enhance their ability to sell at lower prices. Hence this demand-pull argument may hold well for the Indian textile sector. The *er* is expected to have a negative effect since depreciation would mean higher value in terms of domestic currency for the same amount of revenue in terms of foreign currency, implying scope to reduce prices.

Based on the literature reviewed in the previous section, the following specifications are assumed for the variables under consideration:[8]

$$exp = g(pd, er, cp, px, imp, prody) \quad ...(5)$$
$$imp = h(er, cp, px, exp, prody, pd) \quad ...(6)$$
$$prody = g(pd, er, cp, px, imp, exp) \quad ...(7)$$
$$cp = g(pd, er, px, imp, prody, exp) \quad ...(8)$$

Equation (5) would, based on the classical price-demand argument, require negative signs for *px*. In Equation (6), *er* is expected to have a positive effect.

Equation (7) might be useful to test whether exchange rate changes can induce productivity improvement and the extent to which the other variables might create incentives to improve productivity.

In Equation (8), the key variables are *prody* and *imp*, which might affect *cp* as argued earlier, while the others represent the incentives to reduce *cp* as in other equations.

The variable prody could be built as the Solow Residual (*e*) of the production function, specified as follows, with K as capital, L as labour and Y as the value of the output:

$$\ln Y_t = a + b \ln K_t + c \ln L_t + e_t \qquad \ldots (9)$$

Inclusion of a trend term in Equation (9) may be argued to be a better specification as it captures technical change. However, this is not done in this study, because of the fact that this would seriously underestimate the total factor productivity (TFP), since the changes in TFP that could be attributed to technical change would be captured by the trend term,[9] rather than the term e_t. Estimation of Equation (9), for different states for some years, and using parameters to construct the TFP series is not attempted because of the fact that by doing this, the dynamic behaviour of the industry is simplified, by assuming that parameters obtained for certain time periods (from 1980 to 2000 in this instance, for the states) may be used to construct the series for the entire time period [1960-2000]. Further, we do not expect the output in the textile sector to be endogenous to exports and other variables in consideration, since the external sector in Indian textiles has, at least in the period considered, been too small to influence the behaviour of the entire sector, owing to the immense constraints arising from the STA, LTA and MFA quotas from 1960 till 2005.

IV. ECONOMETRIC METHODOLOGY

A stationary time series involves a constant unconditional expectation, to which the forecast of a sufficiently longer period in the future would converge. However, in most of the economic time series, there is a trend, which leads to two sets of non-stationary specifications, namely, trend-stationary and difference-stationary models. A slowly decaying Auto-Correlation Function (ACF) is indicative of a large characteristic root, true unit root process, or trend-stationary process. Formal tests can help determine whether or not a system contains a trend and whether that trend is deterministic or stochastic. Augmented Dickey-Fuller (ADF) test is used for the testing of the null hypothesis of unit root. The most general equation that is estimated in this test is given below:

$$\Delta y_t = \alpha + \beta y_{t-1} + \gamma t + \delta_2 \Delta y_{t-2+1} \delta_3 \Delta y_{t-3+1}$$

$$+ \ldots + \delta_p \Delta Y_{t-p+1} \varepsilon_1 \qquad \ldots (10)$$

Ho: $\beta=0$ and $\gamma=0$; H1: not Ho

Equation (10) is to be estimated for this test, if an existence of trend is suspected. If it is not so, then the term γ alone could be removed, leading to a specification in which a mean exists without trend or α term could also be removed leading to a zero-mean process without trend. The choice among these variations is crucial in the cases where they contradict each other. This could be done by a combination of the examination of the plot and a sequential procedure developed by Doldado, Jenkinson and Sosvilla-Rivero [1990, Pp. 249-73], which advocates stopping the procedure as soon as the null is rejected, while conducting the joint test starting with Equation (10). If the null is not rejected at this stage, then Ho of $\gamma=0$ is tested using normal distribution and if it is significant, unit root is re-tested using standardized normal distribution. Similar trials are undertaken sequentially with the equation with mean and then that without mean to decide upon the unit root.

Philips-Perron's [explained in Philips, 1988, Pp. 333-46] (PP) test accounts for the serial correlation using a non-parametric correction. The test statistics of ADF and PP have the same distributions. The optimal number of lags p for these tests is decided based on the Newey-West [1988] criterion that selects the model with minimum autocorrelation in the error term.

Co-integration is the phenomenon that each component $X_{i,t}$, $i = 1,\ldots,k$, of a vector time series

process X_t is a unit root process, possibly with drift, but certain linear combinations of the $X_{i,t}$'s are stationary.

$$X_t = X_{t-1} + \lambda + V_t, \qquad (11)$$

where V_t is a zero-mean k-variate stationary time series process and m is a k-vector of drift parameters, but there exists a kXr (k rows and r columns) matrix b with rank $r < k$ such that $b'X_t$ is (trend) stationary.

Granger [1981, Pp. 121-30] shows that under some regularity conditions we can write a cointegrated process X_t as a Vector Error Correction Model (VECM):

$$\Delta X_t = \pi_0 + \pi_1 t + \Pi_1 \Delta X_{t-1} + \dots$$

$$+ \Pi_{p-1} \Delta X_{t-p+1} + \alpha\beta'X_{t-p} + U_t, \qquad \dots(12)$$

where Δ is the difference operator ($\Delta X_t = X_t - X_{t-1}$), the U_t's are independently and identically distributed.

$$\pi_1 = \alpha\gamma_1 \qquad \dots(13)$$

for a r-vector γ_1. The latter condition is called *co-integrating restrictions on the trend parameters*, and is necessary because otherwise X_t would be vector unit root process with linear drift (which is rare in practice). Thus:

$$\Delta X_t = \pi_0 + \Pi_1 \Delta X_{t-1} + \dots$$

$$+ \Pi_{p-1} \Delta X_{t-p+1}$$

$$+ \alpha[\gamma_1 t + \beta'X_{t-p}] + U_t \qquad \dots(14)$$

Johansen's [1988, Pp. 231-54] approach is to estimate the VECM by maximum likelihood, under various assumptions about the trend or intercept parameters and the number r of co-integrating vectors, and then conduct likelihood ratio tests. Assuming that the VECM errors U_t are

independently and normally distributed, and given the co-integrating restrictions on the trend or intercept parameters, the maximum likelihood $L_{max}(r)$ is a function of the co-integration rank r. The lambda-max test is based on the log-likelihood ratio $\ln[L_{max}(r)/L_{max}(r+1)]$, and is conducted sequentially for $r = 0,1,...,k-1$. The hypotheses tested are: Ho: co-integration rank is equal to r, H1: co-integration rank is equal to $r+1$. The trace test is based on the log-likelihood ratio $\ln[L_{max}(r)L_{max}(k)]$, and is conducted sequentially for $r = k-1,...,1,0$. This tests Ho: co-integration rank is equal to r against H1: the co-integration rank is k. The latter implies that X_t is trend stationary. Both tests have non-standard asymptotic null distributions. Moreover, given the co-integration rank r Johansen also derives likelihood ratio tests of the co-integrating restrictions on the intercept or trend parameters.

If the vector X_t is I(1), then Equation (15) below

$$\Delta X_t = \pi_0 + \Pi_1 \Delta X_{t-1} + \dots + \Pi_{p-1} \Delta X_{t-p+1} + U_t \qquad \dots(15)$$

is the VAR (Vector Auto Regression) representation of the system, which is well-specified only if there is no co-integration between the variables in the vector X_t. In case there is co-integration, VAR is mis-specified precisely because of the omission of the error-correction term.

In a VAR system, the orthogonalised impulse response functions, i.e., the effects of a shock in each of the variables in the vector in one period on each of the other variables in a period in the future, can be estimated by a decomposition method. Further, block exogeneity can be checked for the variables. The contribution of each of the variables in the system to the forecast error variance of each of the other variables can be estimated by VAR analysis. These features of VAR analysis attempt to compensate the inability

to analyse the relationship between the variables owing to the absence of cointegration. To be precise, when the variables are not cointegrated, it is clear that there is no long run relationship between them, but their short-term relationship could well be analysed by various features of VAR analysis, such as the ones described above.

Granger's causality [1981, Pp. 121-30] can be tested between two variables by testing for the joint significance of coefficients of all the lags of the variable that is claimed to cause, in the equation containing the variable claimed to have been caused as the dependent variable in the VAR system. In VECM, Granger causality requires the inclusion of the coefficient of the error-correcting term also in the joint significance test.

In this study, after estimating the TFP residuals from the production function, all the seven series are tested for the presence of unit root. All the series, except the productivity residual, seem to have a trend, and hence. the unit root tests are done, including the trend and intercept. However, the results were also cross-checked with the other possibilities and found to be consistently indicating that all the series, except cp and pd, are I(1), while these two are I(2). We do not include them for the cointegration analysis since their order of integration is different from the others.

Then, a Johansen's cointegration test is done for the five variables (explained further in the section on results). Owing to the absence of cointegration, a VAR system is specified and the Granger causality and the impulse response functions are analysed. Hence, the X-vector in this case would be *(exp, px, imp, er, prody)*, meaning that only the variables in the bracket here are included in the analysis. In other words, Equation (8) is removed, and a new equation that expresses exchange rate as a function of the

remaining four variables is included, with the elimination of pd and cp from Equations (4)-(7). This is because of the fundamental feature of VAR analysis that it cannot be done for variables that have different orders of integration. At this stage, it should be emphasised that dropping of pd and cp was essential mainly because of the statistical nature of these series. It was because they have an order of integration that is different from that of others. However, we do not expect this to influence the major focus of this paper, which is on exports, exchange rates and productivity. However, these variables were included in the analysis to start with, owing to the equation for mark-up analysed in the theoretical framework.

Further, this has strong implications, including endogeneity of exchange rates. This is justified to the extent that textile exports as well as textile machinery imports, which influence the balance of payments to a limited degree, may be partial determinants of exchange rate, though this specification may suffer from the omitted variables bias. Though nominal exchange rate was fixed for some period, it is noted that the variations in nominal effective exchange rate have not been very low in the sample period considered [1960-2000] as shown in Figure 5.

The optimum lag length is selected based on Schwartz Bayesian Information Criterion, which penalises for high variance of the error term in the model and gives credit for high likelihood of the observed values of the dependent variables given the independent variables. In other words, this test statistic is inversely proportional to model variance and directly proportional to the model likelihood. The analysis of the impulse response functions and forecast error variance decomposition is done to attempt for some conclusions on the inter-relationships among these variables.

The Johansen's tests [1988, Pp. 231-54] for cointegration among all possible meaningful combinations of these variables show that it exists between textile exports and their prices, and textile exports and the exchange rate.[10] VECM models are then built for the cointegrated variables and Granger causality tests [1981, Pp. 121-30] are verified with them.

V. RESULTS

As seen in Figures 2 to 7, all the series, except productivity, seem to follow an approximate trend. However, it cannot be taken as the basis for the selection of the type of unit root test that is to be performed. For example, the exchange rate plot, despite following a rough trend, is not smooth, owing to the fixed exchange regime in India for many years. Hence, all the variants of ADF test (which allow for the drifts and the trends) and PP test (which allow for serial autocorrelation) are performed for all the series, and economic theory and plots are used to select the most appropriate of them, only when there is a conflict among these results.

Figure 2: Plot of ln(Productivity)
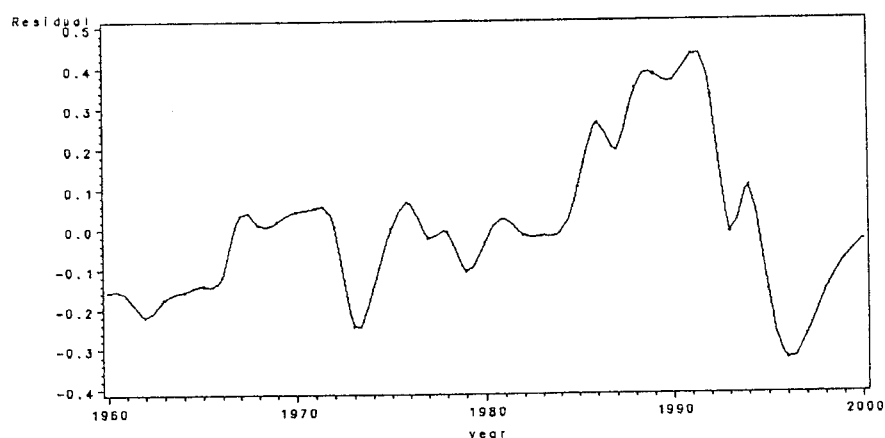
Figure 3: Plot of ln(Textile Exports)
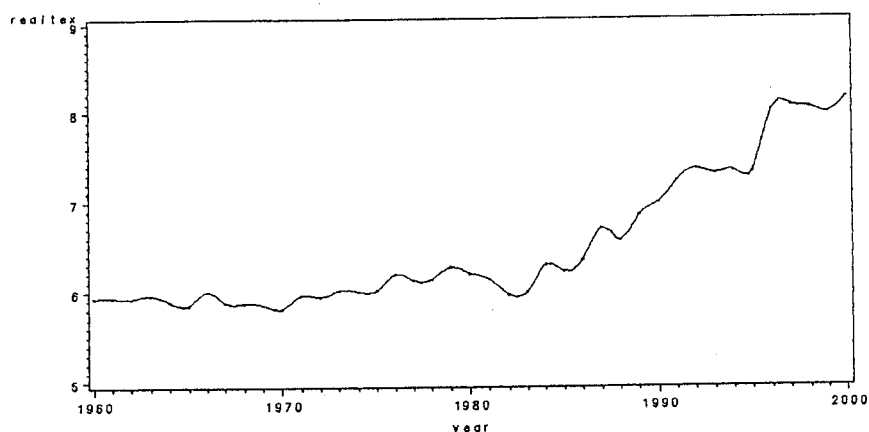
Figure 4: Plot of ln(Textile Export Prices)
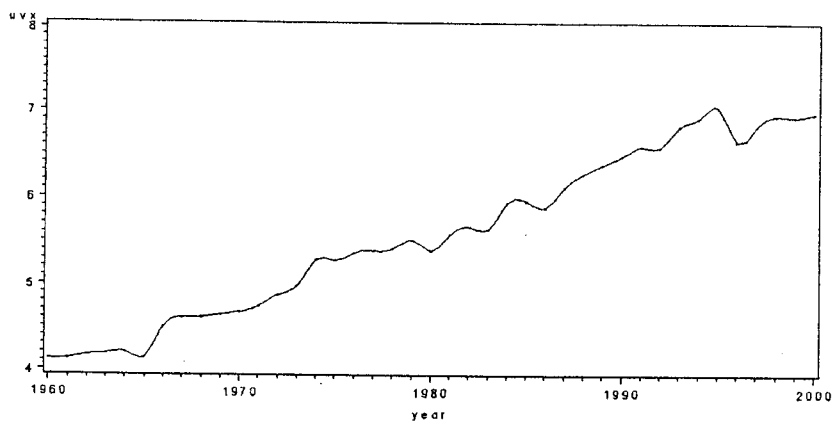
Figure 5: Plot of ln(Exchange Rates)
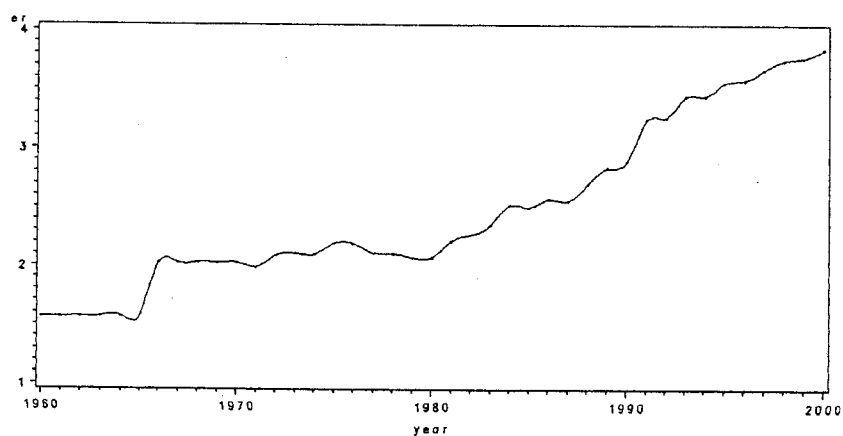
Figure 6: Plot of ln(Production Cost)
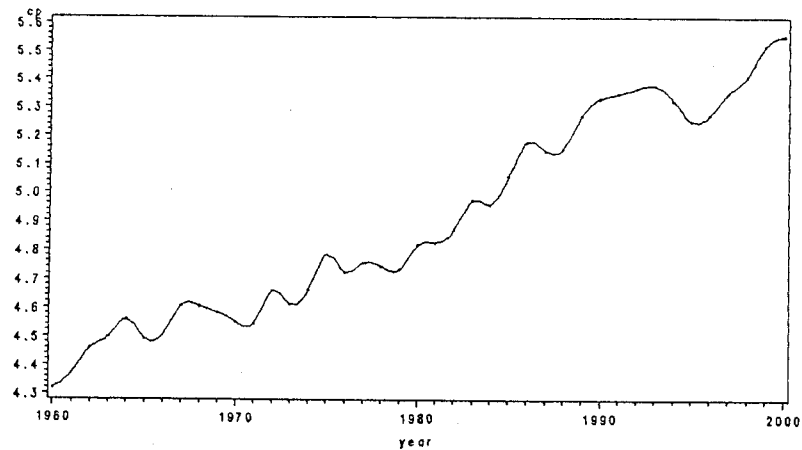
Figure 7: Plot of ln(Import Prices of Machines)
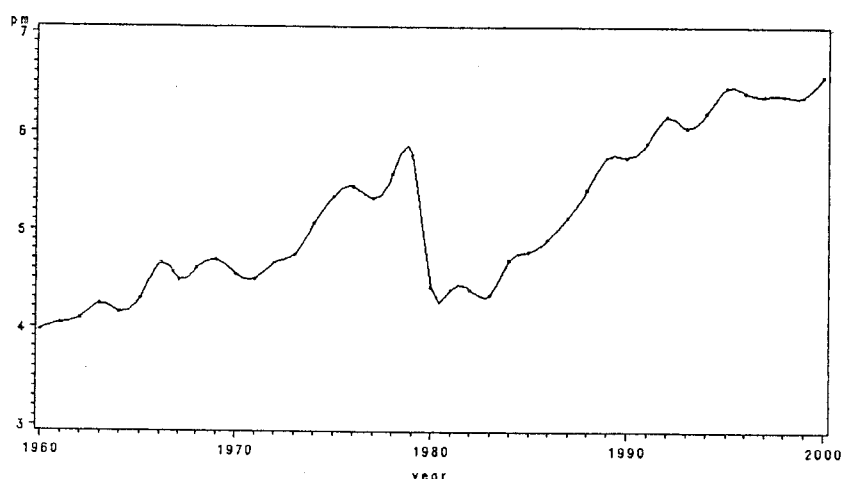
Table 1 shows the results of the Augmented Dickey Fuller test for unit roots for the variables included in the study. The results based on Philips [1988, Pp. 333-46] tests are not shown in the table, owing to the fact that ADF tests have been proved to perform better than the others through Monte-Carlo simulation. This might seem to contradict what was said before, that PP test is an improvement over ADF, but statistically, by Monte-Carlo experiments, it has been established that ADF is superior. Further, PP results did not differ qualitatively from ADF's. The second differences of *cp* and *pd* are found to be stationary.

Hence, all the other series are I(1), while these two are I(2). The optimum lag lengths is chosen based on the Newey-West [1987] criterion and are not shown, so as not to clutter the table.

Further, unit root tests are also carried without mean and with trend. However, their results are not included as they are the same, as the ones without trend and mean. Unit root tests with trend are meaningless for the first differences, as that would necessitate quadratic trend in the levels, and hence, are not included in the table.

Table 1. Results of ADF Unit Root Tests

Variable	Without trend, with mean		Without mean and trend		With trend and mean		Optimal Lags
(1)	Level (2)	First Difference (3)	Level (4)	First Difference (5)	Level (6)	Level (7)	First Difference (8)
Exp	1.537	-3.472*	2.403	-2.732*	-0.933	2	2
Er	0.489	-3.12*	2.489	-2.397*	-3.939	4	8
Pd	-1.771	-1.577	1.082	-0.845	-2.207	5	4
Cp	0.449	-2.035	1.8	-0.426	-2.129	8	9
Px	0.743	-4.265*	3.029	-2.222*	-2.554	3	2
Imp	-0.744	-2.796*	1.344	-2.588*	-1.961	2	2
Prody	2.601	-2.642*	1.465	-2.819*	-2.544	8	8

Note: Critical value: -4.076 at 1 per cent, -3.466 at 5 per cent and -3.159 at 10 per cent levels of significance.
* indicates rejection of the null of unit root at either of these levels of significance.

Table 2 shows the results of Johansen's cointegration test for the five I(1) variables. This shows that despite an existence of cointegration when 3 lags are taken, selection of the number of lags based on the Schwarz Bayesian Information Criterion (SBIC) leads us to conclude that there is no cointegration at the optimum lag length of 1. This means that these variables are not in a long run relationship. Hence, a VAR (1) model could be built with these variables, to comment on their short run relationships.

Table 2. Results for Cointegration Between EXP, PX, PRODY, IMP, ER (HO: r=0)

No. of lags	With Trend		Without Trend		p-value for Ho: there is trend	SBIC	Existence of a Cointegrating Vector
(1)	Trace (2)	Critical Value (3)	Trace (4)	Critical Value (5)	(6)	(7)	(8)
1.	35.55	68.68	55.01	75.74	0.0017*	-18.244	No
2.	46.00	68.68	68.16	75.74	0.0005*	-16.734	No
3.	68.76	68.68	87.08	75.74	0.0023*	-15.522	Yes

Table 3 clearly indicates the existence of co-integration between exports and their prices for all the three models considered, based on different number of lags taken, of which the one with one lag has the best SBIC. Table 4 shows the existence of co-integration between exports and exchange rate.

Table 3. Results for Cointegration Between EXP and PX (HO: r=0)

No. of lags	With Trend		Without Trend		p-value for Ho: there is trend	SBIC	Existence of a Cointegrating Vector
(1)	Trace (2)	Critical Value (3)	Trace (4)	Critical Value (5)	(6)	(7)	(8)
1.	6.28	15.34	23.61	19.99	0.0002*	-7.454	Yes
2.	10.61	15.34	30.65	19.99	0.0001*	-7.335	Yes
3.	9.37	15.34	23.05	19.99	0.0023*	-6.923	Yes

Table 4. Results for Cointegration Between EXP and ER (HO: r=0)

No. of lags	With Trend		Without Trend		p-value for Ho: there is trend	SBIC	Existence of a Cointegrating Vector
(1)	Trace (2)	Critical Value (3)	Trace (4)	Critical Value (5)	(6)	(7)	(8)
1.	10.71	15.34	23.71	19.99	0.0002*	-7.996	Yes
2.	10.16	15.34	21.18	19.99	0.0001*	-7.617	Yes
3.	14.70	15.34	22.09	19.99	0.025*	-7.373	Yes

The results of the VAR(1) model estimated with the five I(1) variables are shown in the Table 5. The vector equation that has been estimated is as follows:

$$\Delta X_t = \pi_0 + \Pi_1 \Delta X_{t-1} + U_t \qquad ...(16)$$

where X_t is (exp, px, er, imp, prody), $\pi 0$ is the 5 x 1 vector of constants and Π_1 is the 5 x 5 matrix of coefficients. The results show that only the changes in the lags of the prices of textile exports, prices of imports of machinery, and textile exports are significant in explaining those in the textile exports.

Weak Granger causality [1981, Pp. 121-30] from a variable x to another variable y is said to exist, if the coefficients of all the lags of the variable x in the VAR equation of the variable y are jointly significant. Being a VAR(1) model, their significance would imply that these variables **weakly Granger cause** the textile exports, while there is no other causality in this system.

The negative causality of textile exports by the prices is as hypothesised.[11] Moreover, exchange rates do have a weak Granger causality to textile exports, and it is positive, which is well-justified in the sense that exchange rate depreciation encourages exports by means of reducing their prices.

Table 5. Results of VAR(1) Estimation

Dependent Variable (1)	C (2)	Δexp(t-1) (3)	Δer(t-1) (4)	Δpx(t-1) (5)	Δimp(t-1) (6)	Δprody(t-1) (7)
Δexp	-0.0082	-0.4013*	0.495**	-0.722*	0.2249*	-0.135
Δer	0.0939*	0.007	-0.0704	-0.0914	-0.0185	-0.0786
Δpx	0.0733*	0.1628	0.0752	-0.2027	-0.06	0.0393
Δimp	0.0787*	-0.2618	0.3211	-0.2384	0.0448	0.2715
Δprody	0.0698	0.1715	-0.0312	0.1198	-0.0545	-0.1424

Note: *: Significant at 5 per cent level of significance, **: Significant at 10 per cent level of significance.

Impulse response functions and forecast error variance decomposition obtained have not been sufficient to conclude anything on the issues under examination, and hence, are not discussed in this section. Vector-Error Correction Models have been built for exp and px as well as exp and er since they are co-integrated. The results of these models are tabulated in Tables 6 and 7. The equations corresponding to Table 6 are (17) and (18).

$$\Delta exp_t = \mu_1 + \beta_1 \Delta exp_{t-1} + \alpha_1 \Delta px_{t-1}$$

$$+ \gamma_1 tres_{t-1} + \varepsilon_1 \qquad ...(17)$$

$$\Delta px_t = \mu_2 + \beta_2 \Delta exp_{t-1} + \alpha_2 \Delta px_{t-1}$$

$$+ \gamma_2 tres_{t-1} + \varepsilon_2 \qquad ...(18)$$

$$tres_t = exp_t - \zeta px_t \qquad ...(19)$$

where $(1, - \zeta)$ is the cointegrating vector for exp and px. 'tres" is the error-correction term, as defined in Equation (19) With the existence of cointegration between two variables and the consequent applicability of the VECM, the test for a strong causality between variables could be carried out.

If the coefficients of the error-correction term and all the lags of the variable x in the VECM equation of the variable y are jointly significant, then a strong Granger causality is said to exist from the variable x to the variable y.

Moreover, *a long run causal adjustment to equilibrium between the variables x and y is said to exist in the variable y if, in its VECM equation, the coefficient of the error-correction term is significant and negative. If the error-correction term is negative, the variable y is too high[12] to be currently in long run equilibrium, and if it is positive, it is too low to be currently in the long run equilibrium with the variable x.*

These results show that the constant term is the only significant one in both of the equations at five per cent level of significance. However, changes in the lagged prices significantly explain the changes in the textile exports at 10 per cent level of significance. In this case, the joint test of significance of α_1 and γ_1 would give implications for the strong Granger causality of exports from their prices, which is nothing but the long run causal relationship. As shown in Table 8, there is

a strong Granger Causality from price of exports to the textile exports, while there is no such causality the other way round.

It should also be noted that the significant negative sign on the error-correcting term in the

equation, for exports, implies that there is a long run causal adjustment. However, its insignificance in the equation of the prices shows that there is no long run causal adjustment in the prices of textile exports to be in equilibrium with exports.

Table 6. Results of VECM Estimation of (16) & (17)

Dependent Variable (1)	β (2)	α (3)	μ (4)	γ (5)	p-value for Ho: $\gamma_i = \alpha_i = 0$ (6)	Implication for Strong Granger Causality (SGC) (7)
Δ exp$_t$	-.1124	-.371**	.0858*	-.1362**	0.0326	Δ px$_t$ SGC Δ exp$_t$
Δ px$_t$	.1455	-.239	.08231*	-.01534	0.36	No SGC

The results of the VECM estimation of Equations (20) and (21), which follow from the existence of co-integration between textile exports and the exchange rate, are tabulated in the Table 7.

$$\Delta exp_t = \phi_1 + \delta_1 \Delta exp_{t-1} + \tau_1 \Delta px_{t-1}$$

$$+ \theta_1 teres_{t-1} + \varepsilon_1 \qquad \qquad ...(20)$$

$$\Delta er_t = \phi_2 + \delta_2 \Delta exp_{t-1} + \tau_2 \Delta er_{t-1}$$

$$+ \theta_2 teres_{t-1} + \varepsilon_2 \qquad \qquad ...(21)$$

$$teres_t = exp_t - \tau er_t \qquad \qquad ...(22)$$

where $(1, -\tau)$ is the co-integrating vector for exp and er. teres is the error-correction term

Table 7. Results of VECM Estimation of (19) & (20)

Dependent Variable (1)	δ (2)	τ (3)	φ (4)	θ (5)	p-value for Ho: $\gamma_i = \alpha_i = 0$ (6)	Implication for Strong Granger Causality (SGC) (7)
Δ exp$_t$	-0.0366	0.0582	0.0517**	-0.2459**	0.554	No SGC
Δ er$_t$	0.0045	-.0865	0.0643*	0.0674	0.543	No SGC

Though the results in Table 7 imply no strong Granger's causality, the significance of the error-correction term in the equation for the exports (19), shows that there is a long run causal

adjustment from the past-period deviations from the equilibrium. Table 8 shows a summary of the results of the weak Granger Causality.

Table 8. Summary of Weak Granger Causality Results

Ho proposed (1)	Test statistic (t) (2)	Result (3)
Δ imp does not weakly GC Δ exp	2.167*	Reject Ho at 5% LOS
Δ px does not weakly GC Δ exp	-2.937*	Reject Ho at 5% LOS
Δ er does not weakly GC Δ exp	1.789**	Reject Ho at 10% LOS
Δ prody does not weakly GC Δ exp	-0.804	Do not reject Ho
Δ imp does not weakly GC Δ prody	0.223	Do not reject Ho
Δ prody does not weakly GC Δ px	-0.644	Do not reject Ho
Δ er does not weakly GC Δ prody	-0.172	Do not reject Ho

As a measure for robustness-testing, the entire analysis has been repeated using the real effective exchange rate index as the variable representing the exchange rate for the period 1970-2000, which is evidently an improvement over the nominal effective exchange rate. However, all of the major results of this study are still found to hold, based on this exercise also.

VI. CONCLUSIONS

This study aimed at analysing the co-integration and causality relationships between the textile exports from India, exchange rate, and productivity, in combination with their prices, their production costs, prices of imported machinery that might reduce these costs, and the domestic prices of the importing countries. While two of these variables could not be included in the analysis owing to their order of integration being different from that of others, there has been no co-integration found to exist between the remaining variables when taken together. However, co-integration has been found to exist between exports and their prices as well as exports and exchange rates.

The existence of the long run causal adjustment of textile exports with respect to the exchange rates, and the strong responsiveness of the textile exports and their prices to the exchange rates, validates the fear of exporters regarding the appreciation. Hence, the answer to the question of exchange rate affecting the textile exports is clear, and that of exports being enhanced by better productivity and lower costs are not in line with the hypothesis proposed in the study. This result might, however, also mean that there has not been sufficient enhancement of productivity and lowering of costs in textile industry to significantly influence textile exports. This is supported by the fact that atleast during the period of this study, many of the textile mills in India had seen very few technological changes. Highly productive advancements like shuttleless looms, high-speed ringframes and other high-tech machines started entering Indian textile sector in large scale only after 2000.

Exchange rate is found to have a long run relationship with textile exports. However, the hypothesis that productivity has long run effects on textile exports is not supported, as indicated by the absence of cointegration between productivity and textile exports.

However, the strong negative causality that runs from the export prices to the exports indicates that any measure that aids in reducing the export prices would enhance the exports even in the long run, as hinted by the existence of long run causal adjustment of textile exports with respect to the prices.

There are other measures of productivity and production costs that could be attempted for inclusion in the analysis in the future. For example, a combination of capital and labour costs could have been used for production cost, but this is not done in this study, since data for capital costs is difficult to obtain without being proxied by interest rates or capital expenditure, which are too crude measures for our purpose. Similarly, technical efficiency measures could be used in place of productivity measure, but this could be argued against, by noting that the former is just a part of the latter. With these notes of caution, such measures could be tried, but have not been done in this study, due to their limitations mentioned above.

APPENDIX

Data Sources and Description of Variables.

The data for the total persons engaged (L), deflated total productive capital stock adjusted for depreciation (K), and deflated gross value of output (Y) of the textile industry (4 two-digit industries) from *Annual Survey of Industries,* [EPWRF's series from 1973-74 to 1997-98, Annual Reports of Results of Annual Survey of Industries for the years from

1960-61 till 1972-73, and 1998-99 till 2000-01] is used to estimate the Solow's residual, based on Equation (8). The deflating price indices are based on Chandok [1990], and the statistics of price indices published by the Ministry of labour, Government of India [in their website]. The time period covered is 1960-2000, and all the variables are deflated to 1968 prices. Given the long time series considered, the earliest possible base year is chosen to deflate the data to, which is 1968. The deflation is done by using spliced price index series (exact price indices are explained in the next paragraph) with base of 1968, by using those of other recent base years. The industries considered here are the NIC-87 codes 23, 24, 25 and 26 [Annual Survey of Industries, Summary Results, 2000-01].

The same source is used for calculating the average annual earnings of employees in the textile industry deflated by the Consumer Price Index (CPI) of industrial workers form Chandok [1990], to be used as a proxy for the production cost, cp. It may be argued that wage rate deflated by the product price is more appropriate for assessing labour cost from the viewpoint of the entrepreneur. However, the existing literature (see, for example, Athukorala and Menon [1994; 1995] uses CPI of industrial workers to deflate wages. Product price indices reflect the value of specific products, and hence, as a robustness test, the correlation between the series deflated by CPI and those deflated by Workers' Price Index (WPI) is tested and found be around 0.9, and hence, the results should be robust to the choice of price index in his case. Further, we focus on labour cost only as a proxy for production cost, not only because of lack of data but also because of the fact that labour forms a major part of the costs in textiles and apparel sector. This is done even in studies for manufacturing sector as a whole, such as Athukorala and Menon [1994; 1995].

The export of textile manufactures, in value terms, is taken as an aggregation of that of yarns, fabrics and garments made of cotton and synthetic fibres, and the jute products, from the website of the Reserve Bank of India (RBI), and the trade statistics of the Government of India. They are deflated to 1968 prices by the GDP deflator, as the export price deflator is not available for India for such a long time series. This need not be a perfect measure of quantity of exports, but captures the real value of exports, which is intended to be a proxy measure of volume of exports.[13] On the other hand, if this is considered as the value of exports, taken as a function of price, then one cannot be sure of an inverse relationship, since the value may go up or down as price increases, depending on the elasticity of demand. Considering unit value of exports to measure quantity of exports may not be accurate, since the former would reflect the average value or price of the exports and not the volume. Unit value of exports were not used to deflate the value of exports of textiles, because a long time series data was not available for this variable.

The data for bilateral nominal exchange rate of India with USA in terms of Rs/$ and the domestic industrial price index for the textile sector with 1968 as base for the USA, as a proxy for pd since a major fraction of Indian textile exports are to the USA, was collected from the International Financial Statistics, published by the IMF [CD-ROM]. It should be noted here that there are limitations arising out of the assumption that domestic prices in the USA may be used to represent the domestic prices of the importing countries. This is to be noted as a limitation of this study, while analysing its policy implications.

The prices of textile exports are calculated as the average unit value index based on the unit value indices of various categories of exports in the textile industry. However, this could not be used to deflate the textile exports, since this would cause a problem of multi-collinearity as exports and their prices appear as co-regressors in some equations in the VAR system considered. This is the motivation to use GDP deflator instead, to deflate the textile exports. Similarly, price index of the imports of machinery,[14] which are likely to increase the efficiency of production, and thereby reduce the cost of production of exports, are proxied by their unit value indices, with 1968 base year. The unit value indices are collected from Chandok [1990] and the trade statistics of the Government of India [website].

NOTES

1. In this study, we are primarily concerned with the textile sector in India, which is now going through major changes both, externally and internally, that have implications for its productivity and exchange rate. This is not intended to be meant for a possible generalisation to other sectors.

2. GDP Deflator series with a base of 1968 was used to deflate the aggregate textile exports in current prices. WPI for textiles was not used for this purpose because of the lack of a comparable and consistent time series data available for this and also because of the fact that domestic wholesale price of textiles need not necessarily reflect the export price movements.

3. These figures are for the year 2005, based on the website of Ministry of Textiles, as viewed in June 2005

4. No specific dummies have been included for the policy events. This is because many of them took place simultaneously and it is difficult to distinguish the effect of one from the other. Further, analyzing all policy impacts is beyond the scope of this paper and in fact, such an attempt would distract us from the focus of the study. Still, to control for the effects of these policies, year dummies have been included in the econometric and time series analysis, though they are not interpreted as policy variables.

5. Exchange rate passthrough is the extent to which the changes in exchange rate changes are translated into the changes in exports or imports.

6. This is called price-discrimination because the

importers from different countries are offered different prices predominantly by virtue of the exchange rate prevailing and not as much by virtue of the production cost.

7. Throughout this paper, the variables mentioned in capital letters are the levels and those mentioned in lowercase are their corresponding logarithms.

8. It should be noted here that this specification is based on the VAR approach, which requires all variables to be considered as explanatory as well as dependent variables in different equations. Thus, theoretically inconsistent possibilities such as "imp" expressed as a function of cost of production, are inevitable in this framework. However, imp cannot be exogenous as well since it may be dependent on er to a large extent. Hence, Equation (6) is inevitable

9. In fact, it was found that the residual term (+ the contribution of trend) obtained while including the trend term in the analysis and that obtained without trend term were positively correlated and hence the results would not change qualitatively

10. These results are explained in detail in Section V, which is on Results.

11. Positive causality of prices of imported machinery is surprising. Imported textile machinery prices could not be used owing to the data limitations, and hence, this result might be a shortcoming arising from this limitation.

12. Here, it is intended to say that y should have been a bit lower in magnitude to come to the long run equilibrium level with x. The word 'too' in this context has to be interpreted in this way.

13. Since a consistent time-series data for quantum index for textile exports was not available, this was not included in this analysis.

14 Ideally, prices of textile machinery imports should have been included instead. However, due to data availability issue, this could not be done. This may perhaps not lead to a strong qualitative bias because: Textile machineries require not only their own imports, but also imports of the machineries that are required to manufacture them as well. Hence, to this extent, total import price of machineries is likely to be correlated with textile machinery import prices. Machinery manufacture, as an industry, is more homogenous and hence machinery imports and textile machinery imports can be expected to possess prices that are strongly correlated with each other.

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Appendix: Data

Year (1)	pd (2)	er (3)	texp (4)	lrdk (5)	lry (6)	ln (7)	cp (8)	mimp (9)	pex (10	lnprody (11)
1960	92.5347	4.77	376.902	6.14695	7.06712	13.9584	75.1293	52.9729	61.5756	-0.1561
1961	92.2098	4.77	378.165	6.31320	7.20825	13.9891	79.0808	56.7567	61.8649	-0.1669
1962	92.4291	4.78	375.965	6.45059	7.26457	14.0021	86.5402	60.0000	64.4901	-0.2187
1963	92.1854	4.79	389.241	6.50806	7.34977	14.0046	89.8335	69.1891	65.4373	-0.1745
1964	92.3723	4.80	361.288	6.51418	7.43004	14.0457	95.6684	63.7837	66.4410	-0.1559
1965	94.2094	4.78	348.528	6.50319	7.42790	14.0383	89.4276	72.9729	62.7965	-0.1405
1966	97.3063	7.58	406.152	6.53823	7.41840	13.9997	90.4152	105.405	89.4868	-0.1187
1967	97.5500	7.55	358.378	6.46895	7.47941	13.9655	100	89.1891	99.6469	0.03554
1968	100.000	7.63	355.700	6.54127	7.51512	13.9748	99.5646	100.00	100.000	0.01083
1969	103.898	7.56	349.695	6.54984	7.52299	13.9701	97.8921	109.00	103.250	0.01970
1970	107.653	7.58	334.465	6.47685	7.54850	14.0046	94.7712	94.00	106.250	0.04464
1971	111.238	7.28	388.245	6.49193	7.59568	14.0252	94.1672	90.00	114.000	0.05298
1972	116.148	8.08	380.911	6.61480	7.72936	14.0963	105.539	106.00	130.500	0.00659
1973	131.413	8.20	411.375	6.79937	7.74271	14.1980	100.811	115.00	144.750	-0.24350
1974	156.132	8.15	404.984	6.68882	7.82063	14.2394	105.835	159.00	197.500	-0.15140
1975	170.568	8.94	410.599	6.58200	7.95144	14.2729	119.774	210.00	195.500	0.00223
1976	178.493	8.88	491.519	6.59736	8.01324	14.2653	112.706	232.00	213.750	0.06469
1977	189.442	8.21	460.142	6.75472	8.08458	14.3053	116.063	206.00	219.250	-0.02300
1978	204.171	8.19	464.624	6.79672	8.16368	14.3301	114.768	264.00	224.500	-0.00610
1979	229.776	7.91	530.038	6.81387	8.13460	14.3728	113.730	320.00	248.500	-0.10640
1980	262.233	7.93	495.562	6.88670	8.18329	14.3211	123.570	83.00	103.333	-0.03270
1981	286.180	9.10	463.593	6.93013	8.21462	14.2823	124.939	81.00	116.666	0.024510
1982	291.935	9.63	389.604	6.99917	8.27912	14.3253	130.448	81.00	129.666	-0.01640
1983	295.609	10.49	403.270	7.08359	8.29491	14.2985	144.465	76.00	133.000	-0.01820
1984	302.656	12.45	544.292	7.09877	8.31780	14.3022	142.277	109.00	159.333	-0.01040
1985	301.201	12.17	505.372	7.28718	8.41585	14.2028	157.087	119.00	168.666	0.10393
1986	292.490	13.12	571.850	7.09840	8.45068	14.2034	177.335	136.00	494.725	0.26126
1987	300.204	12.88	818.184	7.23137	8.46423	14.1994	172.019	169.75	559.617	0.19358
1988	312.273	14.95	711.847	7.15272	8.51604	14.1633	173.413	225.75	725.382	0.34743
1989	327.749	17.04	944.746	7.45989	8.84553	14.2315	195.042	314.00	249.932	0.38029
1990	339.429	18.07	1,084.85	7.64177	8.92648	14.2142	206.883	314.75	979.170	0.36659
1991	340.183	25.83	1,382.54	7.67104	8.96197	14.1815	210.425	361.50	1065.900	0.42889
1992	342.203	26.20	1,585.52	7.83972	9.03681	14.2289	214.273	478.25	1303.630	0.32690
1993	347.216	31.38	1,492.23	8.50701	9.19855	14.2735	216.539	425.50	1392.290	-0.01030
1994	351.718	31.38	1,542.38	8.39590	9.27588	14.2985	205.570	493.75	1411.570	0.10458
1995	364.298	35.18	1,512.26	8.52713	9.26792	14.4176	191.267	637.50	1471.960	-0.15630
1996	372.841	35.93	3,029.21	8.86179	9.26935	14.3853	195.316	1,567.7	1567.700	-0.32840
1997	372.597	39.28	3,182.43	9.02604	9.46185	14.4038	211.331	586.50	1926.850	-0.26920
1998	363.349	42.48	3,107.45	8.88390	9.33121	14.2969	223.768	589.00	1991.100	-0.15690
1999	366.389	43.49	2,939.98	9.01719	9.45905	14.2716	249.826	583.50	2156.870	-0.08070
2000	387.562	46.75	3,486.73	9.01105	9.53816	14.2967	258.204	714.75	1727.680	-0.03280

DOCUMENTATION

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

In the present section, we publish the Report of The Fact Finding Committee, On Regional Imbalance.

1. Report of The Fact Finding Committee, on Regional Imbalance, Government of Maharashtra, Planning Department, Bombay, April 1984, Chapters I, II, III, IV, VII, VIII, XIV, XVII, and Appendix, (Chairman: V.M. Dandekar).

REPORT OF THE FACT FINDING COMMITTEE
ON REGIONAL IMBALANCE
Government of Maharashtra, Planning Department, Bombay, April 1984

CHAPTER I
INTRODUCTION

1.1. The decision of the Government to appoint our Committee was announced in both the Houses of the State Legislature on July 29, 1983. The necessary orders were issued by G.R.P.D. No. RDV-1082/CR-38/PRG-14 dated August 3, 1983.

1.2. The preamble to the Government Resolution reads as follows: There is a feeling among the people that the development of the different regions of the State has not occurred in a balanced manner and there is a demand voiced in the State Legislature and other media that this should be achieved. The Government is aware of the problem and, from time to time, has taken steps to achieve balanced development of different regions. The process of economic development depends on the historical background and tradition, natural resources, economic infrastructure, and several such factors. Considering the complexity of the process, the Government has decided to undertake an objective and in-depth study of the problem of regional imbalance. For this purpose, the Government has decided to appoint a High Level Fact Finding Committee of Experts. Besides, the Government has also decided to appoint four regional committees for Vidarbha, Marathwada, Konkan and rest of Maharashtra, to suggest remedial action and concrete porgrammes, based on the report of the Fact Finding Committee, to remove imbalance between districts within their respective regions.

1.3. Our Terms of Reference are as follows:

(1) To decide on indicators for assessing imbalance in development.

(2.A) On the basis of (1) above, and in relation to the average development in Maharashtra, to determine districtwise imbalance in 1960 and in the latest year for which information is available.

(2.B) With this in view, to obtain information on the development expenditure incurred districtwise from 1960 upto the latest year for which information is available and the implementation of the development programme.

(2.C) To take into account the assistance given by the State and Central Governments and by institutions under their jurisdiction.

(3) To determine what action the Government could take in relation to which of the indicators and the limits thereof.

(4) To suggest remedial action to remove the existing imbalance as determined and long term measures to prevent recurrence of such imbalance.

1.4. The constitution of the Fact Finding Committee is as under:

1.	Dr. V.M. Dandekar	..	Chairman
2.	Dr. Neelakantha Rath	..	Member
3.	Dr. Narottam Shah	..	,,
4.	Shri P.D. Kasbekar	..	,,
5.	Shri Bhujangarao Kulkarni	..	,,
6.	Shri B.G. Dave	..	,,
7.	Dr. V.V. Borkar	..	,,
8.	Dr. S.A. Deshpande	..	,,
9.	Dr. V.N. Rao (Expert on Public Health)	..	,,
10.	Shri M.A. Chitale (Expert on Irrigation)	..	,,
11.	Shri R.T. Atre (Expert on Roads)	..	,,
12.	Shri S.M. Vidwans (Expert on Economics and Statistics)	..	,,
13.	Shri B.N. Bhagwat,* Managing Director, SICOM (Expert on Industries)	..	,,
14.	Secretary, Finance Department	..	,,
15.	Secretary, Planning Department	..	,,
16.	Deputy Secretary, Planning Department	..	Member-Secretary

* Appointed under G.R., P.D. No. RDV-1082/CR-38/PRG-14, dt. 29-9-1983.

1.5. We were asked to submit our report before December 31, 1983. However, in spite of our best efforts we found this difficult and had to request the Government to extend the period first upto February 29, 1984, then upto March 31, 1984, and again upto April 30, 1984, which the Government kindly granted. (G.R., P.D. No. RDV-1082/CR-38/PRG-14, dt. 7-1-1984; G.R., P. D., No. RDV-1082/CR-38/PRG-14, dt. 8-3-1984; G.R., P. D., No. RDV-1082/CR-38//PRG-14, dt. 31-3-1984).

1.6. The Committee commenced its work from 2nd September, 1983 and during the months of September and October, 1983 held 7 preliminary meetings.

1.7. Subsequently, from 8th November, 1983 to 26th November, 1983, the Committee undertook tours of the various districts and held meetings with the DPDCs. All members of the DPDCs, Presidents/Vice-Presidents of the Z. Ps., Chairmen of the Subject Committees of the Z. Ps., Chairmen of the Panchayat Samitees, implementing officers at the District level, Commissioners of the concerned Municipal Corporations, representatives of the organisations such as Marathwada Janata Vikas Parishad, Vidarbha Vikas Mahasabha and the Vidarbha Industries Association, were invited to attend these meetings. The discussions have proved extremely useful. During this tour all districts were covered except Bombay and Bombay Suburban district, which was covered separately on 6th January 1984.

1.8. After completion of the tour the Committee held a series of meetings to examine and verify the data submitted by several departments, deliberate and finalise the report.

1.9. It will be seen that it has taken a total of 62 meetings, 30 in the districts and 32 among ourselves, for us to complete the report. This has been an arduous task. We could not have completed it within the short time given to us but for the courtesy and co-operation we received from all concerned. We wish to keep on record our grateful thanks, first and foremost, to all the officials and non-officials we met at the meetings with the DPDCs. Second, our thanks are due to all the officers of the Departments and subordinate. Offices of the Government of Maharashtra, and the public sector corporations and financial institutions who collected, collated and supplied us the requisite information and data in a form to meet our requirements. In this connection, we should make special mention of the staff of the Directorate of Economics and Statistics. The map attached to our chapter on Industry is prepared by Messrs Enesar Cartographers, Bombay. Last, but not the least, we should mention the staff of the Planning Department who serviced us ably throughout our deliberations.

1.10. With great grief, we record the sudden death of one of us, Dr. Narottam Shah, in the evening of 23rd March 1984, soon after returning home after attending our meeting that afternoon. Dr. Shah's publication Levels of Economic Development in Districts of Maharashtra (June 1982), had added a new dimension and a perspective to the problem of regional disparities in Maharashtra. His contribution to our deliberations was greatly valued. We are sorry that he is not there to sign our report.

1.11. We hope our report presented in the following pages will meet the expectations both of the Government and the people. We are unanimous in our principal recommendations. But there are two Notes of Dissent and two

Supplementary Notes. These together with the reply from the majority members are given in Appendix.

CHAPTER II
HISTORICAL BACKGROUND

2.1. Disparities in the development of different parts or regions of a country exist in almost all countries of the world, developing as well as developed, and it is increasingly recognised that these must be narrowed down. In the context of India, the National Committee on the Development of Backward Areas in its Report on General Issues Relating to Backward Area Development, (November, 1981) notes: "In a large country like India, disparities in levels of development of different parts are inevitable. Regions differ in their history, their resource endowment and environment, the level of infrastructural development and the attitude of the inhabitants to development opportunities". (para 2.1) and, further: "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". (para 4.1) This is also true of Maharashtra State. The preamble to the Government Resolution appointing our Committee makes a reference to this feeling of being neglected and left behind prevailing in some regions of the State. Though these regions are not named, the reference obviously is to Vidarbha, Marathwada and, Konkan, particularly the former two. Hence, it will be appropriate and useful to give the historical background of the regional feeling in Maharashtra and our own approach to the problem arising therefrom.

Nagpur Agreement:

2.2. The problem goes back to the reorganization of the States. The States Reorganisation Commission was appointed by the Government of India on December 29, 1953. In anticipation, informal deliberations began among eminent social and political workers of Maharashtra on the formation of a Marathi-speaking State out of contiguous Marathi-speaking areas of the then Bombay, Madhya Pradesh and Hyderabad States, and they signed an agreement which would constitute the basis for bringing together the three Marathi-speaking areas in one single State. The agreement is known as the Nagpur Agreement (September 1953). Its salient features are as under:

(1) For the purpose of all types of development and administration, the three units, namely, Vidarbha, Marathwada and the rest of Maharashtra will be retained as such.

(2) Subject to the requirements of a single Government, the allocation of funds for expenditure over the different units will be in proportion to their population but, in view of the undeveloped conditions of Marathwada, special attention will be given to promote all-sided development of that area. A report in this behalf will be placed before the State Assembly every year.

(3) The three units will be given representation in proportion to population in (a) the composition of the Government, (b) the admission to all educational institutions having training facilities in vocational and scientific professions or other specialised training, and (c) the services, of all grades, under Government or Government-controlled enterprises.

(4) The High Court of the new State will have its principal seat at Bombay and a second seat at Nagpur. The Bench at Nagpur will ordinarily function for Vidarbha area. While making recommendations of High Court Judges it shall be seen that Vidarbha and Marathwada areas get adequate representation in respect of appointments from the services and the bar.

(5) Subject to the efficient conduct of administration of a single State, the advantages derived by the people of Vidarbha from Nagpur as the capital of their State shall be preserved to the extent possible. The Government shall officially shift to Nagpur for a definite period and at least one session of the State Legislature shall be held every year in Nagpur.

(6) The administration will be decentralised as an effective means of better associating the people of different units with the administration.

States Reorganization Commission

2.3. The States Reorganization Commission reported in September 1955. It did not recommend a unilingual Marathi speaking State. Instead, it recommended a bilingual State of Bombay comprising broadly the Marathi-speaking areas of the then Bombay and Hyderabad States and Gujarati-speaking areas of the then Bombay, Saurashtra and Kutch States. Notably, the Commission recommended a separate State of vidarbha. The Commission's recommendation for a separate State of Vidarbha is to be found in Chapter VIII of its Report. In the following, we briefly summarise the same.

The origin of the movement for Maha Vidarbha can be traced back to 1905. In the circumstances which prevailed about fifty years ago, the demand for the creation of Maha Vidarbha inevitably took the form of a claim for separation from the Hindi-speaking areas. In recent years, however, the question whether this separation should lead to the formation of Maha Vidarbha or the integration of this area with a larger Marathi-speaking unit has assumed importance (para 441). The case for the integration of these areas with Western Maharashtra rests primarily on the ground of linguistic homogeneity, although it has also been claimed that the economics of the two regions are complementary. On the other hand, the arguments, advanced in favour of a separate State are historical, cultural, administrative and financial (para 443). Historical accidents are to a large extent responsible for the feeling in favour of separation which exists today in the major part of Vidarbha. Vidarbha's financial history under the bankers, to whom the revenues were farmed out, was also so unusual that there has been understandably a certain degree of suspicion ever since of persons from outside the area (para 447).

Vidarbha's financial surplus, so far as we are aware, continues. In view of the satisfactory financial position of Vidarbha and since Maharashtra without Greater Bombay is likely to be a deficit area on revenue account to a very much greater extent, there is some reluctance in this area to join Maharashtra. There seems to be some *prima facie* justification for the suspicion that if Vidarbha joins Maharashtra, it cannot be certain that its resources will be spent within its own area on suitable development schemes and projects (para 448). The position will, of course, be different if Greater Bombay forms part of Maharashtra (para 449).

Another reason for the creation of a separate Vidarbha State is the fear that Nagpur will be completely overshadowed by Bombay city, which would be the natural capital of a single Maharashtra State, if it were created. Communalism, it has been stated, may also be introduced

into the political life of Vidarbha if it joins Maharashtra. Land and tenancy laws in this area will have to be modelled oh those of Bombay State; and a period of transition during which Vidarbha may be struggling to maintain and safeguard its interests, may be unavoidable. Important sections of the people in Vidarbha, in these circumstances, are not willing to run this risk (para 450).

That there is deep-rooted regional consciousness in Vidarbha is conceded even by the leaders of the movement for Samyukta Maharashtra who have offered to make concessions to allay the fears of the people of Vidarbha. The Akola and Nagpur agreements, which aim at reconciling the different points of view, go so far as to provide for a tractwise allocation of a defined share not only in the cabinet and the executive and judicial services, but also in the educational institutions. They also contemplate the establishment of a High Court at Nagpur, the recognition of two capitals and the distribution of development expenditure on agreed basis. As we have observed in the Chapter on the new Hyderabad State, these arrangements are not workable, and, if our assessment of public opinion is correct are no longer regarded by a section of leaders as a satisfactory means of finding a solution (para 451). After weighing the merits and demerits of the contending view's, we have come to the conclusion that it will be in the interest of all concerned if the Marathi-speaking districts of Madhya Pradesh, which form a compact unit, are constituted into a separate State (para 452).

The Commission's recommendation for a separate State of Vidarbha was of course not accepted and, in 1956, the bilingual State of Bombay comprising the Marathi speaking areas of the then Bombay, Madhya Pradesh, and Hyderabad States and the Gujarati speaking areas of the then Bombay, Saurashtra, and Kutch States came into being.

Article 371(2):

2.4. As a consequence of the bill for the re-organization of States, the Constitution had to be amended. This was done by the Constitution (Ninth Amendment) Act, 1956. Among other amendments, Article 371, which had regard to the administration of the part B States and President's special powers thereof, was amended. With the abolition of Part B States, this Article was deleted and a new Article 371 (1) and 371 (2) was substituted.

2.5. Article 371 (1) was with regard to Punjab, as then constituted, and Andhra Pradesh. It provided for the constitution of regional committees and for modifications to be made in the rules of business of the Government and in the rules of procedure of the Legislative Assembly of the State. Accordingly, the President of India passed orders in 1957 for the State of Punjab and in 1958 for the State of Andhra Pradesh. For the latter, only one such committee was constituted for the Telengana region.

2.6. Article 371 (2) had regard to the State of Bombay as then constituted. It was added at the instance of the members from Vidarbha and with the full support of members from other areas of Maharashtra. The Report of the Joint Committee to which the Constitution (Ninth Amedment) Bill, 1956 was referred, records as follows: "It was urged before the Committee by its members from Vidarbha that the agreement entered into in September, 1953, known as the Nagpur Agreement, should to the extent practicable, be given constitutional recognition. The members from the other Maharashtra areas gave their full support to this proposal. A clause has accordingly been

added to the proposed Article 371 with the consent of the members from Maharashtra" (para 17). In 1960, when Bombay State was bifurcated into Gujarat and Maharashtra, only verbal modifications were made. Article 371 (2) now reads as under:

"Notwithstanding anything in this Constitution, the President may by order made with respect to (the State of Maharashtra or Gujarat), provide for any special responsibility of the Governor for-

(a) the establishment of separate development boards for Vidarbha, Marathwada, and the rest of Maharashtra or (as the cases may be) Saurashtra, Kutch and the rest of Gujarat with the provision that a report on the working of each of these boards will be placed each year before the State Ligislative Assembly:

(b) the equitable allocation of funds for developmental expenditure over the said areas, subject to the requirements of the State as a whole; and

(c) equitable arrangements providing adequate facilities for technical education and vocational training, and adequate opportunities for employment in services under the control of the State Government, in respect of all the said areas, subject to the requirements of the State as a whole."

Chief Minister's Assurance:

2.7. In 1960, when the bill for reorganization of the Bombay State into Maharashtra and Gujarat came up for consideration in the Bombay Legislative Assembly, Shri Y. B. Chavan, the then Chief Minister of Bombay, made a statement in the House giving certain assurances to Bombay City, Vidarbha and Marathwada. The relevant extract reads as under:

I wish to assure the people of Bombay City that it is the firm intention of the future Government of Maharashtra to preserve the cosmopolitan character of the city and to pay special attention to its developmental needs.

Likewise, I wish to assure the people of Vidarbha that they need have no apprehension that their legitimate interests will not be protected; on the other hand, they will be zealously guarded and will be treated as a sacred trust of the future Maharashtra Government. The terms of what is known as the Nagpur Pact will be honoured and wherever possible something more will be done.

Perhaps the House is not aware that the Nagpur Pact applies as much to Marathwada as to Vidarbha and I would like to state that the terms of the Nagpur Pact so far as they relate to Marathwada will equally be fulfilled. To reassure our brothers in these regions, I have placed on the Table of the House a statement of policy regarding Bombay City, Vidarbha and Marathwada, which I have just lead out to you. I have taken the opportunity to stress the need for the planned development of the Konkan districts and scarcity areas of Maharashtra as well.

In this connection I would like to draw the attention of the House to Article 371 of the Constitution which contains special provisions for Bombay and other States. That Article envisages separate Developments Boards, equitable allocation of funds for developmnetal expenditure, equitable arrangements for technical education and vocational training and adequate opportunities for employment in State Services. The protection afforded by this Article will continue in the residual State of Bombay, that is Maharashtra.

The statement of policy placed on the Table of the House referred to above contains, *inter alia*, specific assurance that separate Development Boards for Vidarbha sad Marathwada will be established and a report about the allocation of funds and the working of these Boards will be placed each year before the State Ligislative Assembly.

A similar declaration was made through an official publication called 'Guiding Principles of Maharashtra (1960). It has been represented to us, with the greatest emphasis, that the Nagpur Agreement, Article 371(2) of the Indian Consti-tution, and Maharashtra's permanent commit-ment to the two, announced in the House and in official publications, constitute the historical basis for the three constituent units to come together to form the new State of Maharashtra.

Follow up of the Nagpur Agreement:

2.8. The provisions of Article 371(2) have not been invoked so far. As for the Nagpur Agree-ment, the Government of Maharashtra is com-mitted to it unconditionally. We may therefore briefly examine to what extent the terms of that Agreement have been satisfied at least formally. First, for all purposes of development and administration, Vidarbha, Marathwada, and the rest of Maharashtra continue to be the main constituent units as envisaged in the Agreement; their borders have remained unchanged. Second, the administration has been decentralised as desired in the Agreement; the two larger con-stituent units of Vidarbha and rest of Maharashtra have been divided into Divisions; through the establishment of Zilla. Parishads and Panchayat Samities in 1962 and later the District Planning and Development Councils in 1974 a great deal of development planning and administration has been decentralised at the district and lower levels;

larger districts have been divided and new dis-tricts created. Third, the special status of Nagpur is recognised: every year, the Government of Maharashtra officially shifts to Nagpur for a period and one session of the State Legislature is held there. It may be said that the official shifting of the Government to Nagpur is too brief and only symbolic. We do not know that it could be anything more than symbolic, nor has it been seriously suggested to us from any quarters that it could be so. Fourth, a bench of the High Court operates from Nagpur as desired in the Agree-ment. In fact, since more recently, another bench of the High Court also has been operating from Aurangabad. It may of course, be said that all this falls much short of the spirit of the Nagpur Agreement.

2.9. In respect of the remaining two terms of the Nagpur Agreement, the position is not so satisfactory. One is the representation in pro-portion to population in (a) Government, (b) Vocational, Scientific Professional and other specialised education and training and (c) ser-vices. Representation in Government is a purely political matter and we presume that political expediency, if nothing else, must have ensured a satisfactory representation to all the units in the cabinet. But, if Government was supposed to include semi-governmental bodies, such as the Government Corporations, the position appears to be unsatisfactory. As regards representation in education, training and services, no specific mechanism was created to ensure representation proportional to population. In its absence, no firm evidence can be presented one way or the other.

2.10. The other term of the Nagpur Agreement not adequately attended to was the allocation of funds for development of different units in pro-portion to their population with special provision for Marathwada and the crucial requirement that a report in this behalf be placed before the State

Assembly every year. It seems that a beginning in this direction was made in the Third Plan (1961-66) of the State which in fact was the first plan for the new State. The plan document (p. 14) presented some indicators of the disparities of development between Vidarbha and Marathwada on the one hand and the rest of Maharashtra on the other and noted that " the State's plans have to strive for the reduction of some of these disparities by the application, if necessary, of a more than proportionate share of the resources for the development of Vidarbha and Marathwada" (wrongly printed as Maharashtra). The idea was to make good the shortfall in the plan expenditure in the first and second Five Year Plans in Vidarbha and Marathwada as compared to the same in Western Maharashtra by higher allocations to these regions. In the Third Plan the shortfall was estimated on a rough basis at Rs. 23 crore for Vidarbha and Rs. 19 crore for Marathwada. Hence, the Third Plan provided additional allocations of Rs 7.7 and Rs. 7.1 crore to the two regions respectively. It was stated (pp. 129-130) that the policy would continue in subsequent plans so that the shortfalls would be wiped out completely by the end of the Fifth Plan or possibly even at the end of the Fourth Plan.

2.11. Irrigation, roads and primary education were listed as the major sectors in which Vidarbha and Marathwada lagged behind. It was recognised that, in addition, Marathwada was also underdeveloped in power development. Higher allocations were made for irrigation and primary education to both Vidarbha and Marathwada and it was stated that higher than proportionate allocations were also necessary for road development in the two regions but that it could not be done because of large spillover of road programme in Western Maharashtra (p. 130). The Plan document in its Appendix V (p. 244-258) shows regionwise allocations of Plan outlays on all schemes other than the State level schemes. But

a report in this behalf was never placed before the State Assembly in terms of the Nagpur Agreement.

2.12. As mentioned above, the higher allocations to Vidarbha and Marathwada in the Third Plan were made on the basis of an assessment of their backlog in the first two plans. The Fourth Plan (1969-74) merely attributed the backwardness of Vidarbha and Marathwada to the meagre allocations to these regions in the first two plans (para 5.2, p. 27). At the same time, it declared (para 5.4, p. 28) that the entire backlog of Marathwada had been cleared and that Rs. 6.6 crore were provided to make up the backlog of Vidarbha.

Reversal of Policy:

2.13. On August 20, 1969, Shri V. P. Naik, the then Chief Minister made a statement before the State Assembly to the following effect: "At the time of formation of Maharashtra in 1960, the view was accepted that Vidarbha, Marathwada and Konkan which were less developed relative to the rest of the State should be given maximum assistance for their development. However, seeing that, except for one or two districts, the rest of the State is largely underdeveloped, we should now reject the view that a certain district or a certain region is underdeveloped and hence should be given additional assistance. Instead, we should direct our efforts to secure a balanced development of all the regions of the State the whole of which is more or less underdeveloped. Taking into account this fact and objective, the Government has sow decided to treat the district as the primary unit of planning." This almost amounted to an abrogation of the Nagpur Agreement. No member in the House seems to have protested.

2.14. The protest came from outside the State Assembly is the form of a private bill to amend the Constitution tabled on July 27, 1973, by Shri Vasant Sathe, then Member of Lok Sabha from Vidarbha and presently a Cabinet Minister of the Government of India. Its purpose was to amend Article 371 so as to make its provisions mandatory. In the statement of Objectives and Reasons for the Amendment Bill Shri Sathe said: "But during the last 15 years, it has been experienced that taking advantage of the wording of the clause (2) of the above article. Such as "the President may" and "subject to the requirements of the State as a whole". separate statutory Development Boards were never established, nor was the equitable allocation of funds for developmental expenditure over the said areas made. Similarly, even the policy of dispersal of industry was abandoned. Hence, it is essential to make it mandatory for the implementation of the above statutory provision enshrined in Article 371(2), so as to ensure balanced regional growth and to prevent the growth of regional tensions". Later, on August 11, 1978, another private bill to amend Article 371 was introduced by Shri S. K. Vaishampayan a Member of Rajya Sabha from Marathwada, for similar reasons. The two bills do not appear to have come up for discussion.

Fifth Five Year Plan (1974-79):

2.15. In the Fifth Plan (1974-79), the problems of regional development were discussed in terms of districts and not in terms of regions, such as Vidarbha, Marathwada and the rest of Maharashtra. Nevertheless, at the end of the Fifth Plan period, the Estimates Committee of the Maharashtra Legislative Assembly in its report on the Budget Proposals for 1979-80, gives certain data supplied by the Planning Department regarding plan expenditure incurred in the three regions of Western Maharshtra (including Konkan) Vidarbha and Marathwada from 1961-62 to 1978-79. We reproduce it in Table 2.1. According to this statement, against an initial estimated backlog of Vidarbha amounting to Rs. 23.0 crore additional expenditure of Rs. 33.80 crore was inclined on Vidarbha during the period from 1961-62 to 1978-79; this exceeds the backlog by Rs. 10.80 crore. Similarly, against an initial estimated backlog of Rs. 19.0 crore of Marathwada, additional expenditure of Rs. 123.46 crore was incurred on Marathwada during this period; this exceeds the backlog by Rs. 104.46 crore. Evidently, the statement is purported to demonstrate that, at least in formal financial sense, the terms of the Nagpur Agreement were fully satisfied.

2.16. However, the evidence is not conclusive. Though the title of the Statement says that it covers the plan expenditure on the divisional and district level schemes, this is not true for all the plan periods. For the Third Plan Period (1961-66), the expenditure did include the divisional and district level schemes as shown in the plan documents (Appendix V, pp. 244-261). It may be noted that even power generation was then treated as a divisional level scheme. As for the period of the Annual Plans (1966-69) and the Fourth Plan (1969-74), it seems that expenditure only on the district level schemes and on major, medium and state sector minor irrigation schemes was included. We could not verify this as the concerned file could not be traced. As for the Fifth Plan period (1974-79), the Statement covers expenditure only on district level schemes for which separate accounting was started from 1974-75. In consequence, the coverage of the development expenditure shown in the Statement rapidly goes down from the Third Plan period to the Fifth Plan period: it covered 91.89 per cent of the Plan expenditure of Rs. 434.73 crore in the Third Plan (1961-66); 68.96 per cent of the expenditure of Rs. 385.60 crore in the three Annual Plans (1966-69); 61.94 per cent of the

expenditure of Rs. 1,004.51 crore in the Fourth Plan (1969-74), and only 35.39 percent of the expenditure of Rs. 2,660.13 crore in the Fifth Plan (1974-79). All plan periods taken together (1961-79), the Statement covers less than half (49.65 per cent) of the plan expenditure, and, on that basis, suggests that the per capita plan expenditure in Vidarbha and Marathwada has been more than in Western Maharashtra. But the position might be the reverse in the other half of the expenditure not covered by the above statement so much so that, if the entire plan expenditure were taken into account, the per capita plan expenditure in Vidarbha and Marathwada might appear to be no more, or even less, than the same in Western Maharashtra. Hence, the evidence is inconclusive and, in the form in which it is given it is misleading.

Sixth Five Year Plan (1980-85):

2.17. In 1980, that is at the beginning of the Sixth Five Year Plan (1980-85), the discussion of regional imbalance of Vidarbha, Marathwada, and Konkan in terms of backlog revived and gathered momentum. In response, the Planning Department, under the guidance of the State Planning Board, undertook a study of districtwise achievements in various development sectors as on 1st April 1980. It came to the conclusion that "noticeable disparities" existed in Irrigation, Roads, Public Health, and Technical Education. It was felt that the disparities in Public Health and Technical Education could be removed by 1985 by internal adjustments within the plan outlays; but, that the requirements under Irrigation and Roads were too large to be met in this manner. Efforts were made to provide additional funds for these two sectors by intra and inter-sectoral diversion of funds. However, with major commitments already made under the Sixth Plan, the scope for such diversions was very limited.

2.18. The Sixth Five Year Plan (1980-85) of the Government of India mentions the following two among its ten objectives: (vii) a progressive reduction in regional inequalities in the pace of development and in the diffusion of technological benefits; and (x) prompting the active involvement of all sections of the people in the process of development through appropriate education, communication and institutional strategies. The Government of Maharashtra, in, its Sixth Plan document published in March 1981, repeats word by word the other eight objectives but, without explanation, omits these two. (Family planning is added to make a total of nine objectives).

2.19. In the Foreword to the Plan documents, the Chief Minister refers to "problems of rapid removal of developmental imbalance as well as removal of backwardness in certain identifiable districts and pockets in the State". This appears consistent with the policy announced by Shri V. P. Naik, the then Chief Minister, on August 20, 1969. Nevertheless, in Chapter I of the Sixth Plan document of the Government of Maharashtra, the following paragraph appears:

"5. While taking full account of the main objectives as spelt by the NDC, (National Development Council), the Maharashtra plan lays special emphasis on programmes for rapid reduction of poverty and unemployment, reduction of regional and districtwise imbalances in a time-bound manner, and pays special attention to the problems of weaker sections of society, ... All the important policy pronouncements made by the Chief Minister and the present Government, especially in regard to the programme relating to the removal of development imbalance' of identifiable underdeveloped areas in the

State like, Vidarbha, Marathwada and Konkan are concretised in the sectoral schemes."

In fact the Sixth Plan does not contain any such specific/timebound schemes as mentioned above.

The reference to the "important policy pronouncements made by the Chief Minister" relates to a 14-Point Programme for Vidarbha, a 35-Point Programme for Marathwada, and a 17-Point Programme for Konkan, the Chief Minister announced in the State Assembly in December

Table 2.1. Plan Expenditure on Divisional and District Level Schemes between 1961-62 and 1978-79

Particulars Population in lakh Expenditure Rs. Crore (1)			Western Maharashtra including Konkan (2)	Vidarbha (3)	Marathwada (4)	Total (5)
Third Five Year Plan 1961-66:						
1. Population (1961)	..	..	240.03	92.07	62.94	395.04
2. Expenditure	..	..	228.45	92.71	76.18	397.34
3. Per Capita (Rs.)	..	..	95.07	100.70	121.03	100.58
4. Additional Expenditure	..	..	....	5.18	16.34	....
Annual Plans 1966-69:						
1. Population (1966)	..	..	277.33	104.51	71.83	453.67
2. Expenditure	..	..	146.52	60.45	58.95	265.92
3. Per Capita (Rs.)	..	..	52.83	57.83	82.07	58.61
4. Additional Expenditure	..	..	....	5.22	21.00	....
Fourth Five Year Plan 1969-74:						
1. Population (1971)	..	..	306.77	116.77	80.58	504.12
2. Expenditure	..	..	350.29	126.15	145.75	622.19
3. Per Capita (Rs.)	..	..	114.19	108.03	180.88	123.42
4. Additional Expenditure	..	..	....	(-)7.19	53.74	....
Fifth Five Year Plan 1974-79:						
1. Population (1971)	..	..	306.77	116.77	80.58	504.12
2. Expenditure	..	..	534.60	234.10	172.83	941.53
3. Per Capita (Rs.)	..	..	174.27	200.47	214.45	186.76
4. Additional Expenditure	..	..	....	30.59	32.38	....
Additionaal Expenditure in 18 years (Rs. Crore)			....	33.80	123.46	....
Backlog Determined Earlier (Rs. Crore)			....	23.00	19.00	....

Source: Estimates Committee, Maharashtra Legislative Assembly Report on Budget Proposals for 1979-80 (p. 31).

1980. It will be noticed that 4 points were added to the 13-Point Programme for Konkan, subsequently. For "monitoring the implementation" of these programmes and "reporting to Government from time to time the actions taken/required to be taken in this regard" Monitoring and Review Committees were constituted for Marathwada on February 10, 1981, for Vidarbha on June 29, 1981, and for Konkan on August 7, 1981. Further in December 1981, the Chief Minister announced, in the State Assembly, an additional 24-Point Programme for Vidarbha. All the special pro-

grammes mentioned above are shown in Annexure.

2.20. Since 1980, the development imbalance and backlog of Vidarbha, Marathwada and Konkan are being raised at several forums and sessions of the State Assembly. The backlog of Vidarbha is regularly debated in the Nagpur Session of the State Assembly while the backlogs of Marathwada and Konkan are discussed in the other sessions of the Assembly. In response, in March 1982, the Government appointed a Study

Group for Determining the Backwardness of Konkan. Its final report is not so far received. The debate on Marathwada was raised during the 1983 Budget session of the Assembly. In the monsoon session of 1983 a resolution was moved to appoint a Study Group at the State Level to study the backlog of Vidarbha, Marathwada and Konkan. In response, on July 29, 1983. the Government announced the appointment of our Committee.

2.21. In concluding this brief historical background of the regional feeling in Maharashtra, we wish to say that, in our opinion, the failure to report to the State Assembly every year in terms of the Nagpur Agreement has been a serious lapse on the part of the State Government. If a report had been made to the State Legislature, as envisaged in the Nagpur Agreement, the matter would have received sustained attention. In the circumstance, this did not happen. The casual attempts recently made for eliminating the regional disparities by announcing a 38-Point, a 35-Point and a 17-Point programme for Vidarbha, Marathwada and Konkan respectively, without specific resources being allocated for the propose, have added to this feeling of distrust. The demand for invoking the previsions of Article 371 (2) of the Constitution is mainly an expression of this feeling of hurt and distrust.

ANNEXURE

Special Programmes declared by Government for Rapid Development of Vidarbha, Marathwada and Konkan Vidarbha

December, 1980

(1) Refund of loans to cotton growers and staying of recovery of new loans of cotton producers is view of scarcity conditions.

(2) Setting up of at least 2 Co-operative Spinning Mills is each of the cotton producing districts in Vidarbha.

(3) Establishment of 3-Big oil extraction plants for production of oil from cotton seed,

(4) Setting up of orange processing plant in view of large scale production of oranges' in Vidarbha.

(5) The support price announced by Government for paddy and jawar will be made effective from the 1980 season.

(6) Encouragement for setting up of Co-operative Societies of Bidi Workers and Weavers.

(7) Establishment of heavy vehicle plants at Bhandara by Ashok Leyland Company by 1983.

(8) Setting up of 2 cement factories of 10 lakh tonnes capacity each in Chandrapur district and their completion within three years.

(9) Setting up of a cellulose plant for processing of cotton lint.

(10) Establishment of Super Thermal Station in Chandrapur district for meeting the increasing demand of power for industrialisation and agricultural development.

(11) Expeditious completion of water supply schemes for Nagpur, Kamptee and Bhandara for supply of water for drinking purposes and industries and making available necessary funds therefor.

(12) Reorganisation of talukas on the basis of Panchayat Samities with effect from 1st May, 1981,

(13) Project affected persons should be rehabilitated as early as possible.

(14) Wardha scheme should be implemented.

December, 1981

(1) (A) 11 major irrigation projects and 38 medium irrigation projects should be completed by 1990.

(B) Survey and investigation of Pindkepar project and its commencement in the VI Plan.

(C) Commencement of Hooman project for supply of water to Durgapur Thermal Stati

(D) Supply of water to Khaparkheda Thermal Station from the Pench Project.

(2) (2) Construction of 2,650 Kms. of new roads for removal of imbalance in roads.

(3) All villages to be electrified by the end of the current Five Year Plan.

(4) Establishment of handloom processing centre at Nagpur.

(5) Drawing up of a special housing scheme for handloom weavers.

(6) To take steps for establishment of 7 sugar factories in Vidarbha.

(7) Establishment of chilly processing centre.

(8) Implementation of 'Operation Flood' scheme in Buldhana, Yavatmal, Bhandara and Chandrapur Districts.

(9) Provision of primary education facility within a distance of 1.5 Km. by end of VI Plan.

(10) Formulation of a project for establishment of industries based on local forest resources.

(11) Development of Kamti-Khairi as tourist centre and providing facilities for visitors at Navegaon-Bandh, Tadoba, Chikhaldara and Nagazira.

(12) Establishment of a post-graduate medical institute at Nagpur on the lines of institute at Chandigarh and Delhi.

(13) Establishment of Cardio-Vascular and Neuro Surgical Unit in Nagpur Medical College during the VIth Plan.

(14) Introduction of Textile Course in Nagpur Polytechnic.

(15) Introduction of training course in carpet weaving for 3,000 youths belonging to the weaker sections and providing Rs. 2.00 crore for this purpose.

(16) Nationalisation of two cotton mills at Pulgaon (Wardha) and Badnera (Amravati).

(17) Conversion of post S.S.C. Diploma course at Regional Labour Institute, Nagpur into degree course during the VIth Plan.

(18) Establishment of manure mixture plant through MAIDC.

(19) Efforts should be made to establish industries based on petro-chemicals.

(20) Efforts should be made towards establishment of a plant of Bharat Electronics Corporation, Bangalore.

(21) Proposal for establishment of a University for Amravati Division should be forwarded to Central Government.

(22) Efforts to be made for establishment of Medical College in Amravati Division.

(24) Establishment of one Engineering College in Vidarbha.

(24) Efforts should be made for establishment of Sainik School at Kamptee.

Marathwada

January, 1981

(1) Completion of Jayakwadi Project Stages I and II during the VIth Plan Period.

(2) Expediting construction of Nandur Madhameshwat, Vishnupuri and Lower Terna Projects, which had come to a standstill.

(3) Comletion of Parli Unit-IV during VIth Plan.

(4) Work of setting up 12 MW Plant at Paithan should be completed as early as possible.

(5) One of the three projects of MELTRON should be set up in Marathwada.

(6) The TEXCOM will either be strengthened or merged in MSTC.

(7) To encourage private sector to set up a composite textile mill in Marathwada.

(8) Completion of the Leather Plant at Gevrai by the LIDCOM.

(9) Encouragement to Private Sector for setting up of light commercial vehicle plant and plastic fibre unit.

(10) Setting up of a Committee to recommend encouragement and revival of traditional handicrafts, Bidri, Himroo and Mashroo shawls industries.

(11) Establishment of at least 5 Co-operative sugar factories in Marathwada.

(12) Establishment of 2 Co-operative Cotton Seeds Oil Plants.

(13) Establishment of at least 10 Co-operative Spinning Mills in Marathwada.

(14) Establishment of Anand type dairy project at Udgir.

(15) Extension of 'Operation Flood to Aurangabad, Beed and Osmanabad Districts.

(16) Establishment of a Dental College in Marathwada.

(17) Establishment of a Dialisis Unit and Cobalt Unit at Aurangabad.

(18) Establishment of one Engineering College during VIth Plan.

(19) Establishment of One Polytechnic in the VIth Plan.

(20) Development of Institute of Science at Aurangabad.

(21) Grant of recognition to the Master of Social Welfare and Industrial Labour Relation courses.

(22) Introduction of sugar technology, textile and electronic courses in Marathwada University.

(23) Black topping of all roads connecting Taluka Headquarters to District Headquarters.

(24) Appointment of a Committee under the Chairmanship of Shri Kazi Saleem for development of Verul and its surroundings.

(25) Establishment of a Sant Peeth at Paithan.

(26) Early disposal of grievances of ex-Hyderabad State employees.

(27) Reorganisation of revenue divisions in Marathwada according to need.

(28) Establishment of a division bench of Bombay High Court at Aurangabad.

(29) Conversion of Manmad-Aurangabad into Broadgauge line.

(30) Early efforts for obtaining approval of the Centre for conversion of Solapur- Osmanabad- Beed- Aurangabad- Dhule Road, Thane- Nagpur- Beed- Nanded- Nirmal Road and Hyderabad- Akola Road into National Highways.

(31) Inclusion of 19 talukas of Marathwada in the centrally sponsored Drought Prone Area Programme.

(32) Recommend to Government of India for establishment of separate sugar zone for Marathwada and adjoining areas.

(33) Establishment of a factory by HMT in Marathwada.

(34) Establishment of T. V. Repeater Centre at Mhaismal.

(35) Constitution of Monitoring and Review Committee at divisional level.

Konkan

August, 1981

(1) Konkan University (Maharashtra Technological University) project.

(2) Medical College (All India Institute of Medical Sciences for communicable diseases) project.

(3) Bombay Mainland Project.

(4) Agricultural projects for Konkan.

(5) Irrigation Projects (Swaminathan Committee's report and Khatal Committee's report).

(6) Hydro Electrical Projects (Balliappa Committee's report).

(7) Improvement of one major port and three other minor ports in Konkan (Kalyani Committee).

(8) Ship breaking yard and off-shore based industries at Agardanda.

(9) Improvement of Dighi Harbour for sugar export.

(10) Horticulture and Social Forestry Project (Jayantrao Patil Committee).

(11) Dry Farming in Konkan area as per directives of the Government in this regard.

(12) Konkan Railway Project.

(13) Two or three projects from the Gulf list of projects likely to be located in Konkan Region and a Paper Project likely to be set up in collaboration with the West African Countries at a suitable point on the Konkan shore.

(14) Establishment of Thermal Power Station at Dabhol.

(15) Development of Fisheries.

(16) Development of Khar lands.

(17) Development of Sindhudurg Complex.

CHAPTER III
APPROACH

3.1. In the previous Chapter, we reviewed the historical background of the problem of regional disparities in Maharashtra and incidentally indicated briefly how the State Government has approached the problem from time to time. In this Chapter, we shall describe our own approach to the problem.

District as Unit of Analysis:

3.2. Our terms of reference require us to examine regional disparities districtwise. This is in consonance with the policy the State Government has pursued since 1972. By a resolution

dated October 20. 1972, Government resolved to constitute a District Planning Board in each district. Its preamble begins with the statement: "The Government of Maharashtra has decided to adopt the district as the unit of planning and to formulate perspective plans for each district so that imbalances in development as between districts and areas within the same district are steadily removed to the extent possible and all the districts are given an opportunity to attain full development having regard to their potential, available manpower, and other resources". Nevertheless, during our tour of the districts, we were struck by the antipathy to this notion and we sensed a deep-seated suspicion, in some quarters, that the Committee has been asked to examine the problem in terms of districts as units mainly to undermine the regional identities of Vidarbha and Marathwada. We wish to assure that we do not view our task in that spirit. It has been persistently impressed upon us that the regional identities of Vidarbha and Marathwada as historically evolved Socio-cultural units, do not undermine the unity of Maharashtra. We share that view. But, at the same time, we believe that an analysis of the problems of regional development and disparities in terms of smaller units such as districts need not and does not undermine the identity of a region. Indeed, it makes possible a better understanding of the complex factors underlying regional disparities in development.

3.3. In fact, the National Committee on the Development of Backward Areas has recommended that the primary unit for the identification of backward areas should be the development block. (Report on General Issues Relating to Backward Areas Development. November 1981). The Committee notes: "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... Hence, the unit chosen must fit into the framework of development administration (para 4.9). The district in India is, on average a large unit... Hence, if the district is chosen as the unit of demarcation, there is danger that the benefit of special measures may accrue largely to the more developed parts of the districts. The development block, ... because it is smaller, is 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" (para 4.11).

3.4. If district is too large a unit to be sufficiently homogeneous for classification according to degrees of development, the constituent units of Maharashtra, namely, Vidarbha, Marathwada, and the rest of Maharashtra, are certainly too large for the purpose. If they are used as the basis for identifying backward areas and determining their backwardness, there is danger, as the National Committee points out, that the benefits of special measures may accrue largely to the more developed parts of the constituent units. This has happened in the past. As we shall see, large disparities in development between the districts and talukas exist within Vidarbha, within Marathwada and within the rest of Maharashtra; they are as large and sometimes larger than the average differences between the three units. Hence it is imperative that we examine the disparities in development at a level below these units, which is either a district or a taluka.

3.5. As mentioned above, our terms of reference require us to examine the disparities in. Development districtwise and this is what we shall do. The readily available data, in most sectors, also do not permit us to go below the district and examine the disparities at the taluka level. But it seems to us that, for many purposes, our analysis will have to be carried further to the

taluka level. We do not wholly endorse the recommendation of the National Committee that the primary unit for identifying backward areas should be the development block. The choice between the district and the block or taluka will depend on the particular field of development and the average level it has reached. Considering the average level of development reached in the particular field, it will depend upon how uniformly we may expect the development to spread either per unit of area or population. In general, with higher level of development, one may expect it to spread more evenly and hence one may take a smaller unit to examine disparities. It is in this sense that perceptions of disparities may be said to be a consequence of development. For instance, in a number of fields such as primary education, primary health care services, village roads, drinking water supply, rural electrification, agricultural and animal husbandry services, and co-operation, Maharashtra has now reached a level of development where it is not unreasonable to expect that it should spread evenly in all talukas. Hence, in examining disparities in development in these fields, it will be appropriate to take the taluka as the unit. We would do this if relevant data compiled talukawise was readily available. On the other hand, the development in certain fields has not proceeded far enough to expect an even distribution as between talukas. Such is the case for instance with secondary and higher education, technical training, hospitals and major district roads. In such cases, one may reasonably expect the development to spread evenly as between districts and it will be appropriate to take district as a unit for judging disparities in development.

3.6. But there are fields where the present level of development is so low that it would be premature to expect an even spread even as between districts. Such for instance is the case with university and professional education, and State and national highways. It is obviously premature to expect a university, or a medical and an engineering college in each district. For the same reason, it is not very meaningful to measure the length of State and national highways in each district, though it can of course be done. To judge the disparities in development in these fields, a unit larger than the district is needed and it will be entirely appropriate to choose for the purpose, the three constituent units of Vidarbha, Marathwada and rest of Maharashtra-Vidarbha and rest of Maharashtra divided into two or three divisions each, simply because they are too large for the purpose in hand. On the other hand, an assessment of the disparities in the development of irrigation in the State cannot be complete without reference to the drought-prone areas and hence some analysis at the taluka level becomes essential. Industrial development has its own peculiar features. The level of development is as yet too low to expect spatially much even distribution. At the same time, even at this low level of development, or because of it, a certain concentration or agglomeration, in what are called growth centres, appears necessary on technical, economic and operational considerations. Therefore, the disparities in industrial development may have to be examined in terms of dispersal of such growth centres. Thus, there does not appear any single unit appropriate for a discussion of disparities in the 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.

Development Expenditure:

3.7. Our terms of reference require us to review the development expenditure incurred in different districts beginning with 1960 upto the latest year for which data may be available. We are sorry to say that within the available time, we could not obtain all the requisite data. In the circumstance,

it has not been possible for us to review the development expenditure incurred in the districts in its totality nor trace such a review as far back as 1960. We shall present the results of available data in a subsequent chapter (Chapter V). Here, we wish to make an observation

3.8. The emphasis on the development expenditure in different districts arises from the concept of backlog in per capita development expenditure incurred in the three constituent units of Vidarbha, Marathwada and rest of Maharashtra As we have seen, this was a key element in the Nagpur Agreement. We have the Budget Proposals for 1979-80, to the effect that the backlog of both Vidarbha and Marathwada has been more than made up, and shown how inconclusive or even misleading such comparisons could be. There is yet another point we would like to make in this context.

3.9. Over the period, the developmental expenditure of the State Government has increased enormously; in fact, 23.63 fold, from a mere Rs. 109.20 crore in 1961-62 to Rs. 2,579.98 crore in 1982-83. A part of this increase is of course due to the larger development activity undertaken and promoted by the Government. But partly the increase in the expenditure is also because of increase in prices and costs over the period. For instance, the average Wholesale Price Index for 1982-83 with 1960-61 as base was 522. Hence, if, over the period, the distribution of Government's development expenditure between districts has changed, it will not be appropriate to add up the developmental expenditure in different districts over the period and compare the total on a per capita basis. This may give apparently equal per capita total developmental expenditure over the period in two districts; but if the total consists of a relatively large expenditure in earlier period in one district and a relatively large expenditure in later period in the other district, the apparent

equality in per capita expenditure would be only nominal. In real terms, the developmental expenditure in one district would be much larger than in the other. Hence, though this has been much used in the present debate, we think that, rather than concentrating attention on per capita development expenditure, we should examine disparities between districts and regions in physical achievements in a number of specific fields.

Indicators of Development:

3.10. This brings us to the question of appropriate indicators of development or backwardness. Our terms of reference also require us to determine indicators to assess imbalance or disparities in development. Many indicators have been used in the current debate. The subject has also been much discussed at the national level. It will, therefore, be useful to give a brief resume of the same.

3.11. Though the first two Plans made reference to problems of regional development, it was in the Third Five Year Plan (1961-66) of the Government of India that a separate chapter was devoted to Balanced Regional Development (Chapter IX). On indicators of development, the Plan document says: "For assessing levels of development in different regions, indicators, of development based on agricultural production, industrial production, investment, unemployment, electricity consumption, irrigated area, value of output by commodity producing sectors, level of consumption expenditure, road mileage, primary and secondary education and occupational distribution of population are useful (para 23). As a comprehensive indicator of economic progress, estimates of State income are of considerable interest in studies of development in different States and regions. There are complex questions connected with concepts, definitions

and techniques of estimating 'State' and 'Regional' income and these have a bearing on the practical value of various estimates. The 'State income' may be considered either as the income originating within the boundaries of a State or as income accruing to its residents. The first concept corresponds to the 'domestic product' for the country as a whole, and the second to the 'national income' For a comparative study of the level of industrial and economic development among States or regions, it is sufficient to have an estimate of income originating within the State or region. The estimates of income accruing to a State on the other hand, may serve as a broad measure of the economic welfare of the residents of the State, as a whole." (para 24).

Pande Committee:

3.12. In 1968, the Government of India appointed a Working Group on Identification of Backward Areas-commonly known as the Pande Committee. This was mainly in the context of providing incentives for industrial development. The Committee recommended the following criterion for identifying backward districts: (i) Distance from larger cities and large industrial projects; (ii) per capita income; (iii) population engaged in secondary and tertiary activities; (iv) factory employment; (v) non/under-utilisation of economic and natural. resources. Subsequently, the Planning Commission, in consultation with the National Development Council, recommended the following criteria: (i) Per capita foodgrains/commercial crops production; (ii) Proportion of agricultural workers; (iii) Per capita industrial output (gross); (iv) Factory employment or alternatively employment in secondary and tertiary activities; (v) Per capita consumption of electricity; (vi) Length of surfaced roads and railway mileage in relation to population. Incidentally, both Pande Committee and the Planning Commission had suggested that, for incentives for

industrial development to be given, the districts should have minimum level of infrastructural facilities.

3.13. The Pande Committee had identified the following 13 districts in Maharashtra as industrially backward according to the criteria laid down by the Planning Commission: Beed, Osmanabad, Bhandara, Ratnagiri, Aurangabad, Yavatmal, Chandrapur, Dhule, Buldhana, Nanded, Parbhani, Jalgaon and Kulaba. These districts were approved by the Planning Commission as backward districts and are qualified to receive financial concessions for development of industries. In particular, the districts of Ratnagiri; Chandrapur and Aurangabad were declared as backward districts qualified to receive from the Central Government outright grant or subsidy equal to 15 per cent of the fixed capital investment of new units. The Draft Fifth Five Year Plan of the State Government notes that the districts, of Chandrapur, Yavatmal, Parbhani, Beed, Nanded and Osmanabad are also identified as economically backward districts, requiring special efforts for their all round development. (Page 451, Chapter 24, para 4(II)).

Chakravarty Committee:

3.14. The problem of identification and classification of backward areas has been more methodically examined by the Chakravarty Committee on Backward Areas. Its Draft Report is extracted by the National Committee on the Development of Backward Areas (Report on General Issues Relating to Backward Areas Development, November 1981, Annexure 4.1). The Committee chose the following fourteen indicators: (1) Density of population per sq. 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 establishments 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; and (14) Percentage of total literates to total population.

3.15. The choice of indicators inevitably depends upon the availability of data. Often, there is much overlap among the chosen indicators. For instance, among the fourteen indicators chosen by the Chakravarty Committee, three relate to consumption of electricity and three to literacy. Having chosen a large number of indicators, indicating levels of development in fields, some closely related, others not so closely related, these are combined into a single index of what might be called an index of overall development. This involves two steps. First, to convert all the indicators to a common base because one cannot combine rupees, miles, numbers and percentages. Two alternative methods are normally used. One is to rank-order all the units, say districts, in descending or ascending order by each indicator. Thus, districts may be rank-ordered according to the density of population per sq. km. and given ranks say from 1 to 25. This is done for each indicator. The other alternative is to convert all indicators to corresponding indices with a common base as 100. Thus, the density of population in a district is expressed as percentage of the average density in the State as 100. This is done for all indicators. Both methods reduce the several

indicators to a common base, so that they may be combined. It should be noted that the two methods judge the disparities very differently. The rank method is particularly arbitrary. For instance, according to the 1981 census, the literacy rate was highest in Nagpur (excluding Greater Bombay) being 54.56 per cent. The next two districts in rank-order are Pune (54.03 per cent) and Amravati (51.82 per cent). The difference between the literacy rates in Nagpur and Pune is 0.53 percentage points; between Pune and Amravati, the difference is 2.21 percentage points. But the difference in ranks is one between Nagpur and Pune and also one between Pune and Amravati, What is worse, the difference between the ranks of Pune and Amravati is one because there is no district with literacy rate between the two. If, for instance, literacy rate of Wardha was between that of Pune and Amravati, the rank difference between Pune and Amravati would be two and not one though the literacy rates of Pune and Amaravati would have remained as they are. From this standpoint, converting indicators to indices is more satisfactory. The arbitrary element in that procedure is the choice of the base, as for instance the State average. If one chose another base such as a norm, a target, or the maximum, and call it 100, the disparities in districts as judged by the index would change too.

3.16. Having converted the several indicators to a common base either by rank ordering or indexing, the next step is to combine them into a single index of what might be called the index of overall development. The chief problem in this is to decide on how much weightage to give to different indicators: How much weight to attach to literacy compared to electricity consumption, or road length? Or for that matter, how much weight to attach to male literacy compared to female literacy? Or, again, how much weight to attach to road mileage per sq. km. compared to road mileage per lakh population. As the National

Committee on the Development of Backward Areas observes: "Since the choice of indicators does not necessarily reflect a prior analysis of relevant factors, there is as yet no acceptable method of aggregation. In many cases, all the indicators are given equal weight on the principle of ignorance. With this procedure, some variable which is over-represented in the set because data are easily available (e.g., literacy) automatically gets a higher weight". (Report on General Issues, Para 4.17).

3.17. In order to construct a composite index, Chakravarty Committee also gave equal weight to all indicators. In the Ranking Method, the individual ranks of the districts by the several indicators were simply added to give a total rank for the district. Then, taking the median value as the cut-off point, all districts which had a value below the median value were classified as backward. By this method, 164 districts (out of a total of 326 districts taken for analysis) got classified as backward areas. In the Index Method also, the aggregate index for a district was obtained by taking a simple average of its indices corresponding to the several indicators. Then, all districts with index below 100 were taken as backward. 206 districts thus got classified as backward.

3.18. There is a third method of aggregating a number of indicators into a single indicator. It is called the Method of Principal Component Analysis. The National Committee on the Development of Backward Areas makes the following comment on this method: "Roughly speaking, the method of principal component analysis can be used to reduce one set of indicators to a smaller number of indicators by taking into account the inter-correlations amongst the indicators in the original set,..... 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". (Report on General Issues, para 4.18).

3.19. Chakravarty Committee has used the Method of Principal Component Analysis. It was found that 83.02 per cent of the total variation of the fourteen variables could be described by three basic, components: 45.04 per cent by the first, 24.21 per cent by the second, and 13.77 per cent by the third component. Judging by the signs on the weights attached to each of the original indicators, the Committee chose to call the first component, the index of backwardness; the second component, the index of rural development; and the third component, the index of industrial development. The districts were classified on the basis of only the first component which accounted for only 45 per cent of the variation of the set of fourteen indicators chosen. 181 districts were classified as backward.

3.20. Thus, the Chakravarty Committee made use of three methods for aggregating the fourteen indicators it initially chose. The Ranking Method classified 164 districts as backward; the Index Method, classified 206 districts as backward; the Principal Component Analysis classified 181 as backward. 155, districts were classified as backward by all the three methods. The Committee considered these common districts to constitute "the hard core of backward areas in the country".

3.21. We may make two incidental observations: (a) As mentioned above, simple ranking method identified 164 districts as backward; of these 155 were common to the other two methods. Hence, as a single method of combining the several indicators, at any rate in the present case, the simple ranking method appears to be adequate. If is also the simplest though rather arbitrary. (b) Among what Chakravarty Committee

calls "the hard core of backward areas in the country", only two districts of Maharashtra appear. One is Beed. The other is, presumably, Chandrapur.

National Committee on Development of Backward Areas:

3.22. From the operational standpoint, the most important criticism made by the National Committee on the Development of Backward Areas (NCDBA) of a composite index of backwardness, howsoever arrived at, is that it "does not classify districts into problem categories and in fact further analysis is required in order to do this" (Report on General Issues, para 4.20).

3.23. The NCDBA examines whether, rather than using a composite index obtained by combining a number of indicators, we could use simple measures like the percentage of population below the poverty line or the rate of unemployment OP the value of the domestic product per capita. The Committee does not find these measures satisfactory. It says: "Poverty and unemployment may be manifestations of backwardness but are certainly not causative factors, (para 4.22). 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 the block or district level the difference between these two concepts can be quite substantial. For instance, a block 01 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 show a high level of income from forestry. Here too (he bulk of this income may accrue to the State

Government rather than to people of 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, e c." (para 4.23). We may add that even these simple measures, such as population below the poverty line, or the rate of unemployment, or the per capita domestic product, are not usually recommended to be used singly as indicators of development. If they are to be used together, the problem of combining them in a composite index arises as in other cases. Further, these simple measures, whether used singly or combined into a composite index, do not also classify the districts into what the NCDBA calls the problem categories.

3.24. The NCDBA also examines whether "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 observes: "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". (para 4.24).

3.25. Thus, the NCDBA does not approve using an overall index to identify backward areas. Instead it recommends that the following problem areas should be recognised as backward: (i) Chronically drought-prone areas; (ii) Desert areas; (iii) Tribal areas (iv) Hill areas; (v) Chronically flood-affected areas; and (vi) Coastal areas affected by salinity. The Committee views these as six types of fundamental backwardness and recognises that an area may suffer from the handicaps of more than one type of fundamental

Backwardness. Besides these six types of fundamental backwardness, the NCDBA recognises two other handicaps: One is the prevalence of feudal elements in production relations and social structure. The second is lack of administrative presence. The first requires fundamental restructuring of society. Regarding the second, the Committee recognises the gravity of the problem but would not treat administrative backwardness as another type of backwardness. It says: "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." (Report on General Issues, para 4.38).

Our Approach:

3.26. We generally share the NCDBA's reluctance to use a single indicator, composite or otherwise to identify backward areas or districts. But, we do not accept the idea of setting aside all quantitative data and instead identify backward areas or districts on the basis of what the NCDBA calls types of fundamental backwardness. In fact, our central purpose is not so much to identify backward areas by classifying the districts into two classes called Backward and not Backward. Our main purpose is to, what the NCDBA calls, "monitor regional inequalities" and this as the NCDBA points out has to be done at "sectoral level". Even in relation to the sector, our purpose is not to construct indicators to identify broad sectoral backwardness such as agricultural backwardness, industrial backwardness, educational backwardness, etc. We propose to examine

disparities in development and measure the backlog of the districts lagging behind in each sector in much greater detail, so that the disparities are identified in operationally meaningful terms. We shall do this in a series of chapters devoted to each sector or subject.

3.27. As a preliminary to such sectoral examination of the disparities, we shall present in Chapter IV some indicators of development. These are: (1) Per Capita Domestic Product; (2) Per Capita Consumer Expenditure; (3) Per Capita Domestic Product originating in Agriculture and Allied Activities Sector; (4) Per Capita Domestic Product originating in Registered Manufacturing Sector; (5) Percentage of Urban Population; (6) Percentage of workers engaged in activities other than agriculture and such occupations as mining, quarrying, livestock, forestry, fishery, hunting, plantations, orchards, etc.; (7) Per Capita Consumption of Electricity; (8) Per Capita Bank Credit and Bank Deposits and Credit/Deposit Ratio; (9) Male and Female Literacy; and (10) Percentage of Scheduled Tribes, Scheduled Castes, Nav Baudhas and Agricultural Labour in the population.

3.28. This general review will be followed, after the Chapter on development Expenditure in districts, by a series of Chapters in which we shall examine the disparities between districts in each sector. Large disparities are known to exist in Roads and Surface Irrigation. Hence we shall begin with them. In Chapter VI, we shall examine the disparities in Road Development and, in Chapter VII, Surface Irrigation. Another item of infrastructure of growing importance is electricity. In Chapter VIII, we shall examine the disparities in Rural Electrification. All the three items of infrastructure are provided at public cost and it is imperative that existing disparities in them should be reduced. We shall assess the backlog in development in those districts where

the present development is below the State Average. For this purpose we shall suggest indicators appropriate to each case.

3.29. We shall next consider a set of social service sectors, namely, General Eduction (Chapter IX), Technical Training (Chapter X), Health Care Services (Chapter XI), and Water Supply (Chapter XII). In all these services, except in Water Supply, though the major part of the services are provided by the Government, a certain amount is also provided by voluntary effort of the people. For instance, there are non-governmental, unaided primary and secondary schools, technical training institutes, and dispensaries and hospitals. While assessing disparties in these sectors we shall not take into account the services thus provided by voluntary effort We shall enquire whether the services provided at public cost are distributed equitably as judged by indicators appropriate to each sector and assess the backlog on that basis. This will ensure that, while trying to reduce the disparities in the provision of these services, voluntary effort is not discouraged,

3.30. Finally, we shall consider the four major production sectors, namely, Industry (Chapter XIII), Agriculture (Chapter XIV), Veterinary Services (Chapter XV) and Co-operation (Chapter XVI). Except for the industrial units in the public sector, the effort in these sectors is essentially private including cooperative. Governmental function is mainly to promote and facilitate the private productive effort and give it a desired direction. Naturally, while assessing the disparities in these sectors, we shall focus attention on examining whether and to what extent the existing disparities arise from the present policies and supporting programmes of the Government

3.31. This does not cover all the sectors; for instance, Welfare of Backward Classes, which we could not examine for non-availability of data. Moreover, we have not been able to examine all the programmes or schemes of the sectors mentioned above; for instance, buildings of primary schools. Our choice was limited by the availability of relevant data. Besides, there are aspects and activities which are considered non-developmental, as for instance, staffing of district and taluka offices, which we have not examined; but if there exist disparities in these respects, they are not altogether irrelevant to disparities in development. Nevertheless, we suppose that our coverage is wide enough to initiate action to remove the existing disparities in some of the more important fields. We expect that necessary steps will be taken to examine and treat in like manner other relevant programmes and schemes at the earliest.

3.32. As already explained, our emphasis throughout will not be so much on the developmental expenditure incurred as the physical targets achieved in the several sectors. We shall assess the disparities in development and the backlog of districts lagging behind in terms of such physical achievements. Having done this, we shall present estimates of financial cost of making up the backlog. This will enable us to aggregate the backlog in several physical items of the several sectors that we shall be examining. This is necessary operationally because practically all remedial action must begin with provision of funds. But there is no implication that provision of funds is all that is needed. This will have to be followed by appropriate programme and action. We do not spell them out because we think that this will be beyond our competence as a Committee.

3.33. After assessing the backlog sector by sector, we shall aggregate the backlog of each district and proceed to examine how the process of removing the backlog may be initiated within the present framework of Planning and Development in the State. This we shall examine in Chapter XVII. It may be possible to obtain additional central assistance for this purpose. There are indications in the Sixth Plan to this effect. We quote: "Central policies with respect to resource transfers will need to be suitably tailored to the benefit of backward regions and broadly in relation to the effort made by the States in this regard. The IATP formula introduced in 1979 and the doubling of the segment for backward States in the Gadgil Formula for allocation of Central assistance for State Plans illustrate the effort made in recent years to modify the distribution of resources in favour of the backward States, "(para 7.84 p. 87), We hope that this orientation will continue in the Seventh Plan. But, in the same para, there is also a warning: "There are, however, obvious limits to the role of Central assistance in the promotion of backward areas and reduction of regional imbalances in development. Moreover, an increase in the flow of resources to the backward States does not necessarily imply that adequate provisions will be made for the backward regions". This is crucial. It calls for a commitment that not only any additional central assistance that may become available but the entire resources at the disposal of the State Government will be directed to reducing the disparities in development within the State. Even more important is a declaration of policy that the effort of the State Government in this direction will not depend upon and will not be limited to any additional central assistance forthcoming.

3.34. Hence, we shall take the total resources as given. We shall also not make any recommendations for reallocation of available funds between sectors. This is because the requirements of sectoral balance are equally important and must be determined at the Central and the State Government level. Moreover, we shall work within the framework of present policies and programmes in the several sectors. There is no implication that there is no room for improvement. In particular, there may be room for modifying some of the policies and programmes to suit better the needs and circumstances of certain districts. Ideally, to remove general backwardness as distinct from specific backlog, we should prepare a development plan for each district in the real sense of the term and not a mere aggregation of schemes prepared at the State and Central level. We refrain from doing this because again we believe that this takes us beyond our competence as a Committee.

3.35. 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.

3.36. We shall carry our analysis in terms of districts as units because, as already mentioned, the readily available data do not permit us to go below the district and examine disparities at the sub-district level such as a taluka or a development block. However, we wish to remind that, in subjects in which the level of development is sufficiently widespread, it will be necessary to carry the analysis to the sub-district level, identify talukas or development blocks which are below the State average and focus attention on them.

This is a logical corollary of the approach we are suggesting. Backwardness and under-development must be identified and attended to wherever they exist and not swept under the carpet of a district or a regional average.

3.37. Because of the past disappointments, the areas lagging behind expect us to give a time-bound programme for removing the present disparities. We are sorry we are not able to lay down such a time limit. In each sector, the time required to bring up the lagging areas to the State average will depend upon the sectoral allocation and the size of the backlog. What we insist is that, subject to some provision for completing on-going works or for natural growth which must unavoidably be made, the entire sectoral allocation shall be used to remove the backlog. But there is another and more important reason why we do not indicate any time limit. The concept of lifting the areas below the State average upto the State average is not a programme to be completed in given time, but a process which continues. As the areas below the average begin to be lifted to the present State average, the State average also rises and some areas, which until now were above the average, may fall below the new average. Hence, the process continues. Speaking of economic development, one often vaguely talks of raising the average. But the average may be raised either by lifting the top or by lifting the bottom. These are two alternative strategies of, or approaches to, development. The first is often chosen on grounds that it raises the average faster. It may do so. But in the process, the distance between the top and the bottom increases to the point of becoming insufferable. Even in purely economic terms, existence of large disparities within an economy inevitably limits the possibilities of overall development and growth. The other alternative, lifting the bottom, may appear slow in raising the average, but the process continuously widens these possibilities by broadening the base of development and growth. 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.

CHAPTER IV
SOME INDICATORS OF
ECONOMIC DEVELOPMENT

Per Capita Net Domestic Product:

4.1. A commonly used measure of the level of economic development of a country is its per capita Net Domestic Product. Net Domestic Product (NDP) provides the value of the sum total of annual economic activity performed within the borders of the country. The same divided by its population gives the per capita NDP. Estimates of the per capita NDP of India are annually computed and published. A continuous series is now available beginning with 1948-49. Similar estimates of the net State Domestic Product (NSDP) are compiled and published for different States. A continuous series for Maharashtra is available beginning with 1960-61. Hence, one may want to compute similar estimates of Net Domestic Product for different districts and, on that basis, compare the rates of their economic growth over the last two decades as also the levels of their present development. We have already referred to the comments of the National Committee on the Development of Backward Areas on the use of these estimates. We may briefly quote them once again: "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 the block or district level the difference between these two concepts can be quite substantial..... 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." (Report on General Issues, para 4.23). We agree with the NCDBA on this point. After careful examination of the data and methods available for estimating Domestic Product of districts, we have come to the conclusion that these estimates do not provide a satisfactory basis for comparing levels of development in different districts. We may briefly explain.

4.2. For computing the estimates of State Domestic Product of States, it is necessary to locate each economic activity occurring within the borders of the country as occurring within the borders of one or the other State. Economic activities covered by the Domestic Product may be broadly classified into two sectors: (A) Commodity Producing Sector, and (B) Non-commodity Producing Sector. The Commodity Producing Sector includes: (i) Agriculture, Animal Husbandry, and allied activities; (ii) Forestry; (iii) Fishing; (iv) Mining; (v) Manufacturing-Registered; (vi) Manufacturing-Unregistered; and (vii) Electricity, Gas and Water Supply. The Non-Commodity Producing Sector includes: (i) Construction; (ii) Transport, Storage and Communication; (iii) Trade, Hotels and Restaurants; (iv) Banking and Insurance; (v) Real Estate, Ownership of dwellings, and Business services; (vi) Public Administration; and (vii) Other services including Education. Location of economic activities in the Commodity Producing Sector in one State or the other is relatively easy. However, serious problems arise in locating economic activities in the Non-Commodity Producing Sector to one State or the other when they are spread over the whole country as, for instance, is the case with transport and communication or banking and insurance. It is recognised that the estimates of State Domestic Product currently being made and published are subject to these limitations.

4.3. While estimating the Domestic Product of districts, these difficulties multiply. For Instance, even in respect of the Commodity Producing Sector, it is difficult to allocate to different districts, the State Product originating in Electricity. In the Non-Commodity Producing Sector, it is difficult to allocate to different districts the State Product originating in Construction and only a part originating in Banking and Insurance can be so allocated. In an Annexure to this Chapter, we give a technical note on the estimation of the Net Domestic Product of districts together with estimates of District Domestic Product for the year 1978-79 so arrived at. We do not intend to use these estimates for reasons explained in the following.

4.4. In Table 4.1, we give sectorwise Net State Domestic Product for 1978-79 and what part of it could be estimated districtwise and what part could not be so estimated. It will be noticed that 87.25 per cent of the State Domestic Product could be estimated districtwise while the balance of 12.75 per cent remains so unestimated. The unestimated portions are mainly from Construction, Electricity, Railway, Air Transport, Communications, and Banking and Insurance.

4.5. The above coverage, 87.25 per cent of the State Domestic Product, is not entirely unsatisfactory. The more unsatisfactory aspect of these estimates is that, for a number of sectors, direct production or income data are not available and hence, as explained in the technical note in the Annexure the State Product originating in these sectors is allocated to different districts on the basis of some indicators, such as number of workers engaged in the activity. In Table 4.1, we show the State Domestic Product for 1978-79 originating in different sectors so allocated to different districts on the basis of indicators It will be seen that the part of the State Domestic Product so allocated amounts to Rs. 4,070 crore in 1978-79. Trade, Unregistered Manufacturing,

and Other Services are the major sectors where, in the absence of direct districtwise data on product or income, the State Product has to be so allocated.

Table 4.1. Sectorwise Net State Domestic Product 1978-79 Districtwise Estimated, Allocated and Not-Estimated Components

(Rs. in Crore)

Sector (1)		Total NSDP (2)	Estimated districtwise (3)	Of which allocated on the basis of indicators (4)	Not-estimated districtwise (5)
1.	Agriculture and Allied Activities	2,771	2,771	63*	..
2.	Forestry and logging	117	46	..	71
3.	Fishing	82	82	..	..
4.	Mining and Quarrying	25	25	..	..
5.	Manufacturing-Registered	2,263	2,241	..	22
6.	Manufacturing-Unregistered	638	638	638	..
7.	Construction	561	..	..	561
8.	Electricity	211	..	..	211
9.	Gas and Water Supply	19	19	18	..
10.	Railways	107	74	74	33
11.	Air Transport	50	..	..	50
12.	Transport by other means and storage	338	328	225	10
13.	Communications	142	82	82	60
14.	Trade, Hotels and Restaurants	1,509	1,509	1,509	..
15.	Banking and Insurance	650	312	312	338
16.	Real estate and ownership of dwellings	187	187	187	..
17.	Business services	74	74	74	..
18.	Public Administration	283	283	283	..
19.	Other Services	605	605	605	..
	Total	10,632 (100)	9,276 (87.25)	4,070 (38.28)	1,356 (12.75)

* Comprise (i) Operation of Government irrigation system, (ii) Veterinary Services (iii) Production of honey, wax-cocoons, raw silk, etc., and (iv) Hunting and trapping.

4.6. Thus, out of the State Domestic Product in 1978-79 estimated at Rs. 10,632 crore, a part amounting to Rs. 1,356 crore (12.75 per cent) could not at all be estimated districtwise; and another part amounting to Rs. 4,070 crore (38.28 per cent) is allocated to districts on the basis of some indicators. Of the two components, the latter is much larger and also more undesirable. When a part of State Domestic Product is not allocated to the districts, the district disparities are determined by the part which is allocated. But when a part is allocated on the basis of indicators, it moderates the district disparities: this is because, allocation on the basis of indicators, such as number of workers, tends to equalise the per capita Domestic Product of different districts, and thus understate the disparities. It constitutes 38.28 per cent of the State Domestic Product. If we leave

it out along with unallocated component which constitutes 12.75 per cent of the State Domestic Product, the coverage of the estimates of Domestic Product of districts is reduced to less than 50 per cent of the State Domestic Product. It would be wrong to compute such partial estimates and call them District Domestic Product. For these reasons, we shall not use them. They are given in the Annexure merely for reference.

4.7. But we shall make one exception. We shall compare our estimates of regional per capita domestic product with the earliest such estimates available. In its Memorandum submitted to the Third Finance Commission (1961), the Government of Maharashtra has presented certain estimates of the State Income for the year 1955-56 (para 2.33, p. 37). Our interest in them lies in the

fact that estimates not only of the income of the whole State but also of the three regions, namely, Western Maharashtra, Vidarbha and Marathwada are given. We could not verify the sources of data and the methodology of computation. These could not be better than what are now available to us. Nevertheless, in spite of the limitations of both those and our estimates, we thought a comparison of relative positions of the regions over a period of 25 years would be of some interest. The estimates of State income then presented are as under:

State Income of Maharashtra: 1955-56

Region		Total income (Rs. in crore)	Per capita income (Rs.)
Western Maharashtra	... ..	727.6	345
Vidarbha	... ..	182.2	231
Marathwada	... ..	94.4	174
Maharashtra Total	..	1,004.2	292

4.8. The purpose of this presentation was not so much to compare the per capita incomes of the three regions but to show that, if Greater Bombay was excluded, the per capita income of Maharashtra was almost equal to the national average (Rs. 260). We quote: "The Socio-Economic Survey of City of Bombay, conducted by the Department of Economics, University of Bombay, took out a sample of 13,000 tenements. Information regarding household and per capita income and expenditure were also collected in this survey. The per capita income worked out to Rs. 53 more or less for the same year for which the State income figures have been provided above. The population of Greater Bombay in the same year could be put at about 3.5 million. It is true that global totals derived from the Bombay City survey data would overestimate income in the city as the sample was based on tenements. However, even assuming that the per capita

income would be around Rs. 50 per month or Rs. 600 per year, the total income accruing in this area would be around Rs. 210 crores. If we deduct this figure from the State income of Maharashtra, we find that the per capita income for the rest of areas would be around Rs. 257 per annum, i. e., almost equal to the national average per capita income for 1955-56" (p. 37).

4.9. Without necessarily accepting the data and the method used, we may adopt the same and estimate the per capita income of Western Maharashtra excluding Greater Bombay. This comes to Rs. 294. Thus, on the basis of the data and method used, it seems that in 1955-56, taking the per capita income of Maharashtra, excluding Greater Bombay to be 100, the per capita income of Western Maharashtra was 114.40, of Vidarbha 89.88 and of Marathwada 67.70.

4.10. As per our estimates of domestic product of the districts in 1978-79 given in the Annexure, the per capita domestic product of Maharashtra excluding Greater Bombay is Rs. 1,278; of Western Maharashtra Rs. 1,360; of Vidarbha Rs. 1,082; and of Marathwada Rs. 1,036. Hence, taking the per capita domestic product of the State, excluding Greater Bombay, to be 100, the indices are; Western Maharashtra 106.42; Vidarbha 84.66; and Marathwada 81.06. Thus, over the period of 25 years, the relative positions of Western Maharashtra and Vidarbha have declined; and of Marathwada improved considerably. Of course, the fact remains that even as judged by the limited estimates, the per capita domestic product of Marathwada is almost 20 per cent below that of the State excluding Greater Bombay.

Per Capita Consumer Expenditure:

4.11. In the absence of, or as a substitute to, a comprehensive measure of per capita product or

Table 4.2. Monthly per capita Consumer Expenditure in Maharashtra

Region		Rs. at current prices			Index with Maharashtra (Excl. Gr. Bombay) = 100		
(1)		1963-64 (2)	1971-72 (3)	1977-78 (4)	1963-64 (5)	1971-72 (6)	1977-78 (7)
Greater Bombay	..	60.88	85.74	151.32	261.7	216.2	223.9
Coastal (Excl. Gr. Bombay)	..	24.53	39.91	81.54	105.5	100.6	120.7
Inland Western	}	24.55	43.80	76.83	105.5	110.4	113.7
Inland Northern			36.83	62.07		92.9	91.8
Inland Central	..	22.19	38.29	61.35	95.4	96.5	90.8
Inland Eastern	}	21.34	37.71	58.07	91.7	95.1	85.9
Eastern			36.49	56.31		92.0	83.3
Maharashtra State	..	26.21	43.93	77.94	112.7	110.8	115.3
Maharashtra State (Excl. Greater Bombay)	..	23.26	39.66	67.58	100.0	100.0	100.0

income, a commonly used measure of economic development of a country and more particularly of the level of living of its people is per capita consumer expenditure. The National Sample Survey Organization (NSSO) of Government of India has been conducting, since 1950-51, nation-wide consumer expenditure surveys. Since the formation of Maharashtra State, data for six years are available: 1961-62, 1963-64, 1971-72, 1972-73, 1973-74 and 1977-78. For 1961-62, data are available for the State as a whole, separately for rural and urban areas, but not separately for districts or regions. In 1963-64, for the purpose of the survey, the State was divided into four regions as under:

1. Coastal: Thane, Raigad, Ratnagiri, Kolhapur, Greater Bombay.
2. Inland: Satara, Sangli, Solapur, Pune, Ahmednagar, Nashik, Jalgaon, Dhule.
3. Inland Central: Aurangabad, Beed, Parbhani, Nanded, Osmanabad.
4. Inland Eastern: Akola, Amravati, Buldhana, Yavatmal, Wardha, Nagpur, Chandrapur, Bhandara.

It will be noticed that the Inland Central region corresponds to Marathwada and Inland Eastern region corresponds to Vidarbha. The Coastal region corresponds to Konkan and Inland region to Western Maharashtra except that Kolhapur district is included in Coastal and not in Inland region.

4.12. In 1971-72 the NSSO revised the regions and Maharashtra was divided into six regions as under:

1. Coastal: Greater Bombay, Thane, Raigad, Ratnagiri.
2. Inland Western: Ahmednagar, Pune, Solapur, Satara, Sangli, Kolhapur.
3. Inland Northern: Jalgaon, Dhule, Nashik.
4. Inland Central: Aurangabad, Beed, Parbhani, Nanded, Osmanabad.
5. Inland Eastern: Nagpur, Wardha, Amravati, Akola, Yavatmal, Buldhana.
6. Eastern: Bhandara, Chandrapur.

It will be noticed that the Coastal region now corresponds to Konkan; Inland Western corresponds to Pune Division except for the inclusion of Ahmednagar; Inland Northern corresponds to Nashik Division except for the exclusion of Ahmednagar; Inland Central corresponds to Marathwada; Inland Eastern and Eastern together

constitute Vidarbha but the division between the two does not correspond to Nagpur and Amravati Divisions.

4.13. Data are available from Central Sample and State Sample. We shall use the State Sample as regionwise results are available only from the State Sample. Further, though the regionwise data are available for 1963-64, 1971-72, 1972-73, 1973-74 and 1977-78, we shall exclude 1972-73 and 1973-74 as these years were affected by scarcity conditions. In Table 4.2 we present the estimates of monthly per capita consumer expenditure for the years 1963-64, 1971-72 and 1977-78. All estimates are at current prices, that is prices current in respective years. We also show the regional averages as percentages of the State (excluding Greater Bombay) average as 100.

4.14. Thus, the monthly per capita consumer expenditure in the State increased from Rs. 26.21 in 1963-64, to Rs. 43.93 in 1971-72, to Rs. 77.94 in 1977-78. Much of this increase is not real but is due to the increase in prices during this period. To examine real increase in per capita consumer expenditure, the above data at current prices will have to be deflated by an appropriate index number of consumer prices. We do not do this as an appropriate index is not readily available. Besides, our main interest lies in the relative positions of the different regions. For this purpose, in the last three columns above, the regional averages are expressed as percentages of the State (excluding Greater Bombay) average.

4.15. To begin with, we may note that the per capita consumer expenditure in Greater Bombay is far above, in fact more than twice, that of the rest of the State. But, over the years, the difference has considerably narrowed; the index for Greater Bombay was 261.7 in 1963-64; it came down to 216.2 in 1971-72; but then slightly increased to 223.9 in 1977-78.

4.16. Turning to the other regions, it will be noticed that the Coastal and Inland regions, constituting Konkan and Western Maharashtra, were above the State average (excluding Greater Bombay) in 1963-64 and remained so in 1977-78. In fact, over the period, both the regions seem to have improved their relative positions. This is clearly true of Konkan. About Western Maharashtra, at least part of the improvement in 1971-72 over 1963-64 is because of separation of the relatively poor Inland Northern region from the Inland Western region. If we compare the positions in 1971-72 and 1977-78, the relative positions of Konkan and Western Maharashtra compared to the rest of the State have improved, much more so of Konkan than of Western Maharashtra. The relative positions of all other regions have deteriorated; of Inland Northern (Jalgaon, Dhule, Nashik) by 1.1 percentage points; of Marathwada by 5.7 percentage points; and of Vidarbha by about 9.0 percentage points. These relative positions, and movements in them over the period, reflect the disparities in the development of these regions.

Per Capita Net Domestic product from Agriculture:

4.17. Returning to the districtwise estimates of per capita domestic product, as explained above, only about half of the State Domestic Product in 1978-79 could be attributed to different districts on the basis of direct production or income data. This comes largely from two major sectors, namely (a) Agriculture and allied activities constituting 26.06 per cent of the SDP and (b) Registered Manufacturing constituting 21.28 per cent of the SDP. Between the two, the district

estimates of product from Registered Manufacturing are based on direct production data. This is not quite true of Agriculture and allied activities. The technical note in the Annexure explains the qualifications clearly. Here we may mention them briefly.

4.18. The Agriculture and Allied Activities Sector includes Agriculture (proper), Animal Husbandry, and Allied Activities. Gross Output of Agriculture and Animal Husbandry is first estimated. This may be broken up into three parts: (i) Major crops accounting for about 57 per cent of the Gross Output; (ii) Minor crops accounting for about 24 per cent of the Gross Output; and (iii) Animal Husbandry accounting for 19 per cent of the Gross Output. Of this, the district estimates of (i) are based on districtwise production data; of (ii) are based on district data on acreage but yield data at the State level; of (iii) are based on district data on animal numbers and productivity data at the divisional or State level.

4.19. To derive the Net Output of Agriculture and Animal Husbandry, one must deduct the inputs from the Gross Output. Except for fertilizers, districtwise data on inputs are not available. Hence, they are estimated at the State level and allocated to districts on the basis of some physical indicators which are unlikely to moderate the district disparities.

4.20. The Allied Activities included in this sector are (i) operations of government irrigation system and veterinary services, and (ii) activities relating to production of honey and wax, cocoons and raw silk, etc., and hunting and trapping. The product or income from these activities is estimated at the State level and allocated to districts on the basis of relevant indicators such as area irrigated under Government canals and number of animals; only in a few cases the allocation is

done on the basis of working force. The net output from these allied activities constitutes only 2.28 per cent of the net output of the sector Agricultural and Allied Activities.

4.21. Hence, in the following, we shall use district estimates of per capita net domestic product o (a) Agriculture and Allied Activities, and (b) Registered Manufacturing as indicators of (a) agriculture resources (not necessarily development) and (b) industrial development respectively. The relevant data for 1978-79 are given in Table 4.3.

4.22. The per capita domestic product from Agriculture and Allied activities for the State, excluding Greater Bombay, is Rs. 519.47 (col. 3). Taking this to be 100, the indices for the districts and regions are shown in col. 4. Marathwada and Western Maharashtra are above the State average, the indices being 118.02 and 112.72, respectively. Vidarbha and Konkan are below the State average, the indices being 87.06 and 58.13 respectively. Districtwise, the index ranges from 154.49 for Jalgaon to 37.23 for Thane. In the following, we list the districts in descending order of the index.

Jalgaon	154.49	Solapur	99.24
Osmanabad	134.13	Nashik	92.85
Sangli	134.06	Pune	91.91
Ahmednagar	128.80	Dhule	90.80
Parbhani	124.42	Akola	90.33
Wardha	123.12	Ratnagiri	81.79
Kolhapur	122.39	Chandrapur	73.70
Satara	118.29	Bhandara	72.14
Beed	116.16	Raigad	71.49
Buldhana	115.84	Nagpur	54.89
Aurangabad	111.57	Thane	37.23
Yavatmal	103.48		
Nanded	101.44		
Amravati	101.44		

We should note that the much higher index of Osmanabad than of Kolhapur, or the higher index of Buldhana than of Nashik emphasises the fact the per capita domestic product from agriculture is not necessarily an indicator of agricultural development, but often only of per capita larger, but undeveloped, agricultural resources such as land. Similarly, the very low index of Nagpur and Thane is because of large urban population in these districts resulting in the per capita agricultural resources being small.

Table 4.3. Net Domestic Product from (1) Agriculture and Allied Activities and (2) Registered Manufacturing, 1978-79

District		Agriculture and Allied Activities			Registered Manufacturing		
		Value Added 1978-79 (Rs. Lakh)	Per Capita (Rs.)	Index*	Value Added 1978-79 (Rs. Lakh)	Per Capita (Rs.)	Index*
(1)		(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	10,514	135.68	..	126,474	1,632.13	..
2. Thane.	..	6,076	193.38	37.23	45,308	1,442.01	757.92
3. Raigad	..	5,199	371.36	71.49	4,270	305.00	160.31
4. Ratnagiri	..	8,430	424.90	81.79	175	8.82	4.64
Konkan (Excl. G. B.)	..	19,705	301.95	58.13	49,753	762.38	400.70
5. Nashik	..	13,558	482.32	92.85	3,098	110.21	57.93
6. Dhule	..	9,108	471.67	90.80	739	38.27	20.11
7. Jalgaon	..	19,814	802.51	154.49	1,639	66.38	34.89
8. Ahmednagar	..	17,068	669.07	128.80	2,448	95.96	50.44
9. Pune	..	18,725	477.43	91.91	21,795	555.71	292.08
10. Satara	..	11,798	614.48	118.29	1,331	69.32	36.43
11. Sangli	..	11,971	696.39	134.06	1,812	105.41	55.40
12. Solapur	..	12,666	515.51	99.24	2,496	101.59	53.40
13. Kolhapur	..	14,947	635.77	122.39	2,725	115.91	60.92
Western Maharashtra	..	129,655	585.55	112.72	38,083	172.08	90.44
14. Aurangabad	..	13,319	579.59	111.57	1,228	53.44	28.09
15. Parbhani	..	11,110	646.31	124.42	62	3.61	1.90
16. Beed	..	8,448	603.43	116.16	36	2.57	1.35
17. Nanded	..	8,684	526.94	101.44	536	32.52	17.09
18. Osmanabad	..	14,611	695.76	134.13	244	11.64	6.12
Marathwada	..	56,172	613.10	118.02	2,106	22.99	12.08
19. Buldhana	..	8,527	601.76	115.84	151	10.66	5.60
20. Akola	..	8,066	469.23	90.33	998	58.06	30.52
21. Amravati	..	9,211	526.95	101.44	504	28.83	15.15
22. Yavatmal	..	8,794	537.53	103.48	273	16.69	8.77
23. Wardha	..	5,590	639.59	123.12	621	71.05	37.34
24. Nagpur	..	6,937	285.12	54.89	3,077	126.47	66.47
25. Bhandara	..	6,487	374.75	72.14	498	28.77	15.12
26. Chandrapur	..	7,416	382.86	73.70	1,566	80.85	42.49
Vidarbha	..	61,028	452.23	87.06	7,688	56.97	29.94
Maharashtra State	..	277,674	469.12	..	224,104	379.43	..
Maharashtra State (Excl. G.B.)	..	266,560	519.47	100.00	97,630	190.26	100.00

* State (Excluding Greater Bombay) = 100.

Table 4.4. Percentage of Urban Population to Total Population

District (1)		1961 (2)	1981 (3)	Increase = Col. 3 - Col. 2 (4)
1. Greater Bombay	..	100.00	100.00	..
2. Thane	..	30.21	44.34	14.13
3. Raigad	..	10.08	14.12	4.04
4. Ratnagiri	..	8.09	8.10	0.01
Konkan (Encl. G.B.)	..	**16.61**	**26.87**	**10.26**
5. Nashik	..	25.60	31.02	5.42
6. Dhule	..	15.97	19.52	3.55
7. Jalgaon	..	22.50	25.14	2.64
8. Ahmednagar	..	10.55	12.97	2.42
9. Pune	..	38.16	47.33	9.17
10. Satara	..	11.08	13.04	1.96
11. Sangli	..	15.64	21.52	5.88
12. Solapur	..	27.94	29.40	1.46
13. Kolhapur	..	19.28	24.82	5.54
Western Maharashtra	..	**22.04**	**27.03**	**4.99**
14. Aurangabad	..	14.14	22.09	7.85
15. Parbhani	..	13.82	18.74	4.92
16. Beed	..	9.85	15.46	5.61
17. Nanded	..	14.44	18.74	4.30
18. Osmanabad	..	10.58	15.39	4.81
Marathwada	..	**12.63**	**18.31**	**5.68**
19. Buldhana	..	16.56	18.49	1.93
20. Akola	..	22.1	24.89	2.79
21. Amravati	..	26.14	29.25	3.11
22. Yavatmal	..	12.61	15.09	2.48
23. Wardha	..	23.65	24.98	1.33
24. Nagpur	..	52.07	56.75	4.68
25. Bhandara	..	10.74	13.10	2.36
26. Chandrapur	..	7.73	12.73	5.00
Vidarbha	..	**22.40**	**26.10**	**3.70**
Maharashtra State	..	**28.22**	**35.03**	**6.81**
Maharashtra State (Excl. G.B.)	..	**19.80**	**25.21**	**5.41**

Per capita Net Domestic Product from Registered Manufacturing:

4.23. The per capita domestic product from Registered manufacturing for the whole State is Rs. 379.43; for the State excluding Greater Bombay, it is Rs. 190.26 (Col. 6). Taking this to be 100, the indices for the districts and regions are shown in col. 7. The disparities are glaring. Konkan is way above (400.70) the State Average and Marathwada is way below (12.08) the State

Average. The indices for Western Maharashtra and Vidarbha are 90.44 and 29.94 respectively. It is these glaring disparities in industrial development which are at the bottom of prevailing regional discontent.

4.24. If we examine the situation districtwise only three districts are above the State Average. They are: Thane, Pune and Raigad; their indices are 757.92, 292.08 and 160.31, respectively. All other districts are below the State Average. They

may be grouped as follows. In bracket are shown their indices:

Nagpur (66.47), Kolhapur (60.92), Nashik (57.93), Sangli (55.40), Solapur (53.40) and Ahmednagar (50.44); Chandrapur (42.49), Wardha (37.34), Satara (36.43), Jalgaon (34.89), Akola (30.52) and Aurangabad (28.09); Dhule (20.11), Nanded (17.09), Bhandara (15.12) and Amravati (15.15); Yavatmal (8.77), Osmanabad (6.12), Buldhana (5.60), Ratnagiri (4.64), Parbhani (1.90) and Beed (1.35).

Proportion of Urban Population:

4.25. Economic development, particularly industrial development, is usually associated with two easily recognisable phenomena. One is an increase in the proportion of population living in urban areas. The other is an increase in the proportion of workers engaged in activities other than agriculture, household industry and other traditional occupations. These sets of figures are available from the Population Censuses. We propose to make use of them and assess the relative development of different districts over the two decades 1961-81.

4.26. In Table 4.4 is given the percentage of urban population in different districts in 1961 and 1981. It will be noticed that the percentage of urban population in the State, excluding Greater Bombay, was 19.80 in 1961 and 25.21 in 1981. We may first examine the position in 1981. In the matter of percentage of urban population, Konkan (26.87), Western Maharashtra (27.03) and Vidarbha (26.10), all were above the State Average (25.21). Only Marathwada (18.31) lay below the State Average. Examining the position districtwise, the following six districts were above the State Average:

District			Per cent Urban Population, 1981
Nagpur	..	..	56.75
Pune	..	..	47.33
Thane	..	..	44.34
Nashik	..	..	31.02
Solapur	..	..	29.40
Amravati	..	..	29.25

4.27. In six other districts the percentage of urban population in 1981 was below the State Average 1981(25.21) but above the State Average in 1961 (19.80). These were:

District			Per cent Urban Population, 1981
Jalgaon	..	..	25.14
Wardha	..	..	24.98
Akola	..	..	24.89
Kolhapur	..	..	24.82
Aurangabad	..	..	22.09
Sangli	..	..	21.52

4.28. In the remaining 13 districts, the percentage of urban population in 1981 was not only below the State Average in 1981 but even below the State Average in 1961 (19.80). These are listed in descending order below:

District	Per cent Urban Population, 1981	District	Per cent Urban Population, 1981
Dhule	19.52	Raigad	14.12
Parbhani	18.74	Bhandara	13.10
Nanded	18.74	Satara	13.04
Buldhana	18.49	Ahmednagar	12.97
Beed	15.46	Chandrapur	12.73
Osmanabad	15.39	Ratnagiri	8.10
Yavatmal	15.09		

We may note that among the six districts with the lowest percentage urban population, Raigad and Ratnagiri districts are from Konkan, Satara and Ahmednagar are from Western Maharashtra and Bhandara and Chandrapur are from Vidarbha. Districts from Marathwada do not appear in this

list; but they appear predominantly in the next group of seven districts shown in the left column above.

4.29. We may now compare the relative development of the several districts over the two decades as judged by the increase in the percentage of their urban population. As mentioned earlier, the percentage of urban population in the State, excluding Greater Bombay, was 19.80 in 1961 and 25.21 in 1981; that is to say, it increased by 5.41 percentage points. In seven districts, this increase was more than the State Average (5.41). These are listed below:

District	Increase in per cent Urban Population: 1961-81 (Percentage points)
Thane	14.13
Pune	9.17
Aurangabad	7.85
Sangli	5.88
Beed	5.61
Kolhapur	5.54
Nashik	5.42

4.30. In the remaining 18 districts, the increase in the percentage of urban population was less than the State Average (5.41). These are listed below in descending order:

District	Increase in per cent Urban Population: 1961-81 (Percentage points)	District	Increase in per cent Urban Population: 1961-81 (Percentage points)
Chandrapur	5.00	Jalgaon	2.64
Parbhani	4.92	Yavatmal	2.48
Osmanabad	4.81	Ahmednagar	2.42
Nagpur	4.68	Bhandara	2.36
Nanded	4.30	Satara	1.96
Raigad	4.04	Buldhana	1.93
Dhule	3.55	Solapur	1.46
Amravati	3.11	Wardha	1.33
Akola	2.79	Ratnagiri	0.01

Proportion of Workers in Non-traditional Occupations:

4.31. We may now turn to the other indicator of development, namely, percentage of workers engaged in activities other than agriculture and such occupations as mining, quarrying, livestock, forestry, fishery, hunting, plantations, orchards, etc. The first set of data coming from the 1981 Census classifies the workers into four classes: (1) Cultivators, (2) Agricultural labour, (3) Workers in Household Industry, and (4) All other workers. Our interest lies in workers in class (4). To obtain comparable figures from the 1961 Census, we deduct from all workers the following: cultivators, agricultural labour, workers in household industry, and in mining, quarrying, livestock, forestry, fishing, hunting, plantations, orchards, and allied activities. Finally, as the coverage and classification of women workers in the Censuses is often unsatisfactory we consider only the male workers. In Table 4.5 are given the relevant data. It will be noticed that in the whole State excluding Greater Bombay the percentage of male workers engaged in relevant activities was 23.9 in 1961 and it increased to 32.2 in 1981.

4.32. We may first examine the position in 1981. Among the regions only in Kokan (43.5) and Western Maharashtra (35.7), the percentage of male workers in relevant activities was above the State Average (32.2); in Vidarbha (27.5) and Marathwada (20.1), it was lower. Districtwise, the percentage was above the State Average in six districts. These are listed below:

District			Percentage of male workers engaged in relevant activities: 1981
Thane	..	..	59.6
Pune	..	..	56.3
Nagpur	..	..	51.6
Nashik	..	..	36.1
Kolhapur	..	..	35.8
Solapur	..	..	35.6

Table 4.5. Percentage of Male Workers Engaged in Activities other than Agriculture,
Household Industry and Other Traditional Occupations

District (1)			1961 (2)	1981 (3)	Col. 3-Col. 2 (4)
1. Greater Bombay	..	..	97.2	94.9	2.3
2. Thane	..	..	39.9	59.6	19.7
3. Raigad	..	..	15.1	27.2	12.1
4. Ratnagiri	..	..	21.8	29.5	7.7
Konkan (Excl. G. B.)	..	..	**26.8**	**43.5**	**16.7**
5. Nashik	..	..	29.0	36.1	7.1
6. Dhule	..	..	18.1	22.9	4.8
7. Jalgaon	..	..	23.4	28.6	5.2
8. Ahmednagar	..	..	20.0	27.5	7.5
9. Pune	..	..	44.0	56.3	12.3
10. Satara	..	..	22.9	30.8	7.9
11. Sangli	..	..	19.0	30.5	11.5
12. Solapur	..	..	27.0	35.6	8.6
13. Kolhapur	..	..	22.5	35.8	13.3
Western Maharashtra	..	..	**26.5**	**35.7**	**9.2**
14. Aurangabad	..	..	17.0	25.5	8.5
15. Parbhani	..	..	17.2	19.2	2.0
16. Beed	..	..	13.1	18.4	5.3
17. Nanded	..	..	17.5	20.9	3.4
18. Osmanabad	..	..	13.1	17.4	4.3
Marathwada	..	..	**15.2**	**20.1**	**4.9**
19. Buldhana	..	..	18.2	20.4	2.2
20. Akola	..	..	22.8	25.6	2.8
21. Amravati	..	..	23.4	26.1	2.7
22. Yavatmal	..	..	16.1	18.9	2.8
23. Wardha	..	..	25.6	26.4	0.8
24. Nagpur	..	..	43.1	51.6	8.5
25. Bhandara	..	..	16.9	19.8	2.9
26. Chandrapur	..	..	14.1	20.1	6.0
Vidarbha	..	..	**23.1**	**27.5**	**4.4**
Maharashtra State	..	..	**33.4**	**41.2**	**7.8**
Maharashtra State (Excl. G. B.)	..	..	**23.9**	**32.2**	**8.3**

4.33. In the following ten districts, the percentage of relevant workers in 1981 was below the State Average in 1981 (32.2), but was above the State Average in 1961 (23.9). These are listed below:

District			Percentage of male workers engaged in relevant activities: 1981
Satara	..	..	30.8
Sangli	..	..	30.5
Ratnagiri	..	..	29.5
Jalgaon	..	..	28.6
Ahmednagar	..	..	27.5
Raigad	..	..	27.2
Wardha	..	..	26.4
Amravati	..	..	26.1
Akola	..	..	25.6
Aurangabad	..	..	25.5

4.34. In the remaining nine districts, the percentage of relevant workers in 1981 was not only below the State Average in 1981 (32.2), but even below the State Average in 1961 (23.9). These are Listed below:

District			Percentage of male workers engaged in relevant activities: 1981
Dhule	..	..	22.9
Nanded	..	..	20.9
Buldhana	..	..	20.4
Chandrapur	..	..	20.1
Bhandara	..	..	19.8
Parbhani	..	..	19.2
Yavatmal	..	..	18.9
Beed	..	..	18.4
Osmanabad	..	..	17.4

4.35. We may now compare the relative development of the several districts over the two decades as judged by the increase in the percentage of male workers engaged in relevant activities. As mentioned earlier, this percentage in the State, excluding Greater Bombay, was 23.9 in 1961 and 32.2 in 1981; it increased by 8.3 percentage points over the two decades. In 8 districts, this increase was more than the State Average. These are listed below:

District	Increase in percentage of male workers engaged in relevant activities, 1961-81 (Percentage points)
Thane	19.7
Kolhapur	13.3
Pune	12.3
Sangli	11.5
Raigad	12.3
Solapur	8.6
Aurangabad	8.5
Nagpur	8.5

It may be said that it is only in the first five districts listed above that the development as judged by the present indicator is above the State Average; in the last three districts, namely, Solapur, Aurangabad, and Nagpur the development is indeed not more than the State Average. Among the first five districts Thane, Pune and Raigad have the advantage of the vicinity of Bombay. In Sangli and Kolhapur, the development appears to be indigenous.

4.36. In the remaining 17 districts the development as judged by the present indicator was below the State Average. These are listed below in descending order. It may be noted that all the bottom nine districts in this list are from Vidarbha and Marathwada.

District		Indicator	District		Indicator
Satara	..	7.9	Osmanabad	..	4.3
Ratnagiri	..	7.7	Nanded	..	3.4
Ahmednagar	..	7.5	Bhandara	..	2.9
Nashik	..	7.1	Yavatmal	..	2.8
Chandrapur	..	6.0	Akola	..	2.8
Beed	..	5.3	Amravati	..	2.7
Jalgaon	..	5.2	Buldhana	..	2.2
Dhule	..	4.8	Parbhani	..	2.0
			Wardha	..	0.8

Consumption of Electricity:

4.37. Consumption of electricity is often used as an indicator of economic development, particularly of industrial development. In Table 4.6, we give the relevant data for two years, 1973-74 (Col. 2) and 1981-82 (Col. 3). In Col. 4 is given

the difference between the two, being the increase in electricity consumption between 1973-74 and 1981-82. In Cols. 5, 6 and 7 these are expressed as percentages of the State total. It will be seen that, in 1973-74, 38.69 per cent of the electricity consumption in the State was in Greater Bombay and another 21.38 per cent in Thane district; the two together accounted for 60.07 per cent of the total consumption. In 1981-82, their share was somewhat smaller: 36.76 per cent of Gr. Bombay and 17.31 per cent of Thane, the two accounting for 54.07 per cent of total consumption. Even in the increase in consumption between 1973-74 and 1981-82, Greater Bombay and Thane accounted for 48.84 per cent of the total.

4.38. The drop in the share of Greater Bombay and Thane by 6.0 percentage points between 1973-74 and 1981-82 (from 60.07 per cent to 54.07 per cent) was picked up mainly by Western Maharashtra and Marathwada, 3.50 percentage points by Western Maharashtra and 2.12 percentage points by Marathwada. The share of Vidarbha actually declined from 12.67 per cent in 1973-74 to 11.52 per cent in 1981-82.

4.39. We may examine the districtwise consumption of electricity in 1981-82 in somewhat greater detail. We shall do this on a per capita basis and separately for consumption for industry and for agriculture. Relevant data are given in Table 4.7. In Cols. 2, 3 and 4 are given per capita consumption of electricity, total, for industry, and for agriculture. In Cols, 5, 6 and 7, these are expressed as indices with average of the State (excluding Greater Bombay) as 100.

4.40. The per capita average consumption of electricity in the State (excluding Greater Bombay) is 173.31 kwh. of which 108.52 kwh. is for industry, 34.55 kwh. for agriculture and the rest for domestic, commercial and other purposes. Of the per capita consumption of electricity for agriculture, 4.28 kwh. is metered and 30.27 kwh. is unmetered; the estimate of unmetered consumption is based on the installed horse-power of pumps. Taking the State per capita consumption as 100, the consumption in Konkan is 261.23, in Western Maharashtra 93.63. in Vidarbha 69.28, and in Marathwada 45.53. The disparities are even greater in per capita consumption of electricity for industry. Taking the State average as 100 it is 373.01 in Konkan, 71.00 in Vidarbha, 70.08 in Western Maharashtra, and only 20.11 in Marathwada. It is only in per capita consumption of electricity for agriculture, that Marathwada, along with Western Maharashtra, stands above the State average. Taking the latter to be 100, the consumption in Western Maharashtra is 151.64, in Marathwada, 127.03, in Vidarbha 41.27 and in Konkan only 8.57.

4.41. In the following districts, the per capita consumption of electricity is above the State average: Thane (445.47), Raigad (190.92), Pune (151.92), Kolhapur (128.86) Nagpur (126.21) and Chandrapur (114.55). In the following districts, the per capita consumption of electricity for industry is above the State Average: Thane (642.32), Raigad (277.65), Pune (155.81), Chandrapur (135.73), Nagpur (122.83) and Kolhapur (115.66). It will be noticed that they are the same districts with a slightly different order. Only in per capita consumption of electricity for agriculture, we get a different set of districts above the State Average. They are: Ahmednagar (284.60), Satara (205.56), Aurangabad (197.77), Jalgaon (192.53), Sangli (162.81), Parbhani (133.26), Solapur (133.75), Nashik (131.00), Dhule (125.73), Osmanabad (114.56) and Kolhapur (114.10).

Per Capita Bank Credit:

4.42. Per capita bank credit is also suggested as an indicator of economic development. Rele-

vant data are given in Cols. 4 and 5 of Table 4.8. The per capita bank advances in the State (excluding Greater Bombay) as on March 31, 1980, was Rs. 292.62. In the following four districts, it was above the State Average: Thane (Rs. 1,103.90), Pune (Rs. 997.30), Nagpur (Rs. 409.69) and Raigad (Rs. 355.21). In Cols. 2 and 3, we give the data regarding bank deposits. The per capita deposits in the State (excluding Greater Bombay) was Rs. 367.19. In three districts, they were above the State Average: Pune (Rs. 1,254.18,) Nagpur (Rs. 765.37) and Thane (Rs. 759.77). In Col. 6 of the Table is shown advances as percentage of deposits. This is the credit/deposit ratio. Only in four districts, the ratio was greater than one: Thane (145.30), Aurangabad (120.80), Raigad (111.39) and Ahmednagar (109.93).

Table 4.6. Consumption of Electricity, 1973-74 and 1981-82

District		1973-74 (M K W H) (2)	1981-82 (3)	Col. (3)- Col. (2) (4)	Index with State = 100		
(1)					Col. (2) (5)	Col. (3) (6)	Col. (4) (7)
1. Greater Bombay	..	2,692.566	5,493.585	2,801.019	38.69	36.76	35.07
2. Thane	..	1,487.766	2,587.552	1,099.786	21.38	17.31	13.77
3. Raigad	..	198.618	491.831	293.213	2.85	3.29	3.67
4. Ratnagiri	..	21.263	66.806	45.543	0.31	0.45	0.57
Konkan (Excl. G. B.)	..	1,707.647	3,146.189	1,438.542	24.54	21.05	18.01
5. Nashik	..	190.626	394.202	203.576	2.74	2.64	2.55
6. Dhule	..	50.197	177.227	127.030	0.72	1.19	1.59
7. Jalgaon	..	175.941	414.200	238.259	2.53	2.77	2.98
8. Ahmednagar	..	115.261	391.228	275.967	1.66	2.62	3.46
9. Pune	..	491.701	1,096.453	604.752	7.07	7.34	7.57
10. Satara	..	64.459	231.460	167.001	0.93	1.55	2.09
11. Sangli	..	89.340	224.080	134.740	1.28	1.50	1.69
12. Solapur	..	139.347	328.081	188.734	2.00	2.19	2.36
13. Kolhapur	..	187.483	559.738	372.255	2.69	3.74	4.66
Western Maharashtra	..	1,504.355	3,816.669	2,312.314	21.62	25.54	28.95
14. Aurangabad	..	61.436	326.421	264.985	0.88	2.18	3.32
15. Parbhani	..	22.325	126.462	104.137	0.32	0.85	1.30
16. Beed	..	13.894	71.362	57.468	0.20	0.48	0.72
17. Nanded	..	36.104	100.444	64.340	0.52	0.67	0.81
18. Osmanabad	..	38.643	142.880	104.237	0.56	0.95	1.31
Marathwada	..	172.402	767.569	595.167	2.48	5.13	7.45
19. Buldhana	..	32.345	85.916	53.571	0.46	0.57	0.67
20. Akola	..	50.800	120.529	69.729	0.73	0.81	0.87
21. Amravati	..	72.402	122.536	50.134	1.04	0.82	0.63
22. Yavatmal	..	30.036	82.693	52.657	0.43	0.55	0.66
23. Wardha	..	43.068	78.850	35.782	0.62	0.53	0.45
24. Nagpur	..	319.368	566.258	246.890	4.59	3.79	3.09
25. Bhandara	..	166.688	257.407	90.719	2.40	1.72	1.14
26. Chandrapur	..	167.468	408.108	240.640	2.40	2.73	3.01
Vidarbha	..	882.175	1,722.297	840.122	12.67	11.52	10.52
Maharashtra State	..	6,959.145	14,946.309	7,987.164	100.00	100.00	100.00
Maharashtra State (Excl. G.B.)	..	4,266.579	9,452.724	5,186.145	61.31	63.24	64.93

Table 4.7. Per Capita Consumption of Electricity in 1981-82

District		Total Consump- tion (KWH)	Of which		Index of Col. (2)	Index of Col. (3)	Index of Col. (4)
			Industry (KWH)	Agriculture (KWH)			
(1)		(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	666.42	413.16	0.02	..	..	..
2. Thane	..	772.04	697.05	3.41	445.47	642.32	9.87
3. Raigad	..	330.88	301.31	4.36	190.92	277.65	12.62
4. Ratnagiri	..	31.64	13.71	1.26	18.26	12.63	3.65
Konkan (Excl. G. B.)	..	**452.73**	**404.79**	**2.96**	**261.23**	**373.01**	**8.57**
5. Nashik	..	131.76	62.15	45.26	76.03	57.27	131.00
6. Dhule	..	86.44	18.08	43.44	49.88	16.66	125.73
7. Jalgaon	..	158.2	71.80	66.52	91.28	66.16	192.53
8. Ahmednagar	..	144.45	28.91	98.33	83.35	26.64	284.60
9. Pune	..	263.29	169.08	24.03	151.92	155.81	69.55
10. Satara	..	113.53	21.00	71.02	65.51	19.35	205.56
11. Sangli	..	122.37	47.64	56.25	70.61	43.90	162.81
12. Solapur	..	125.69	57.68	46.21	72.52	53.15	133.75
13. Kolhapur	..	223.33	125.51	39.42	128.86	115.66	114.10
Western Maharashtra	..	**162.27**	**76.05**	**52.39**	**93.63**	**70.08**	**151.64**
14. Aurangabad	..	134.14	50.14	68.30	77.40	46.20	197.77
15. Parbhani	..	69.13	7.96	47.77	39.89	7.34	138.26
16. Beed	..	48.02	7.04	30.42	27.71	6.49	88.05
17. Nanded	..	57.42	17.94	22.81	33.13	16.53	66.02
18. Osmanabad	..	64.05	15.17	39.58	36.96	13.98	114.56
Marathwada	..	**78.90**	**21.82**	**43.89**	**45.53**	**20.11**	**127.03**
19. Buldhana	..	56.94	14.00	31.34	32.85	12.90	90.71
20. Akola	..	65.97	29.60	16.59	38.06	27.28	48.02
21. Amravati	..	65.83	22.25	22.64	37.98	20.50	65.53
22. Yavatmal	..	47.60	15.71	16.40	27.47	14.48	47.47
23. Wardha	..	85.09	43.35	15.68	49.10	39.95	45.38
24. Nagpur	..	218.73	133.30	10.56	126.21	122.83	30.56
25. Bhandara	..	140.08	105.17	5.88	80.82	96.91	17.02
26. Chandrapur	..	198.53	147.29	1.77	114.55	135.73	5.12
Vidarbha	..	**120.08**	**77.05**	**14.26**	**69.28**	**71.00**	**41.27**
Maharashtra State	..	**238.06**	**148.52**	**30.02**	..	..	..
Maharashtra State (Excl. G.B.)	..	**173.31**	**108.52**	**34.55**	**100.00**	**100.00**	**100.00**

**Table 4.8. Deposits and Outstanding Advances of Commercial Banks
as on March 31, 1980**

District			Deposits		Outstanding		Percentage of Col. (4) to Col. (2)
			Advances Rs. Lakh	Per capita (Rs.)	Advances Rs. Lakh	Per capita (Rs.)	
(1)			(2)	(3)	(4)	(5)	(6)
1. Greater Bombay	..	..	492,091	5,969.51	353,332	4,286.24	71.80
2. Thane	..	..	25,464	759.77	36,998	1,103.90	145.30
3. Raigad	..	..	4,740	318.88	5,280	355.21	111.39
4. Ratnagiri	..	..	6,827	323.35	2,196	104.01	32.17
Konkan (Excl. G.B.)	..	..	37,031	532.87	44,474	639.98	120.10
5. Nashik	..	..	9,458	316.14	6,604	220.74	69.82
6. Dhule	..	..	3,465	169.00	2,287	111.54	66.00
7. Jalgaon	..	..	8,994	343.51	3,967	151.51	44.11
8. Ahmednagar	..	..	6,130	226.34	6,739	248.83	109.93
9. Pune	..	..	52,230	1,254.18	41,116	997.30	78.72
10. Satara	..	..	6,581	322.81	3,795	186.15	57.67
11. Sangli	..	..	6,193	338.19	4,134	225.75	66.75
12. Solapur	..	..	7,896	302.51	5,376	205.97	68.09
13. Kolhapur	..	..	8,196	327.01	6,387	254.83	77.93
Western Maharashtra	..	..	109,143	464.05	80,405	341.87	73.67
14. Aurangabad	..	..	5,063	208.06	6,116	251.33	120.80
15. Parbhani	..	..	2,036	111.29	1,495	81.72	73.43
16. Beed	..	..	1,558	104.84	1,250	84.12	80.23
17. Nanded	..	..	2,138	122.22	1,762	100.72	82.41
18. Osmanabad	..	..	2,204	98.81	1,826	81.86	82.85
Marathwada	..	..	12,999	133.61	12,449	127.96	95.77
19. Buldhana	..	..	2,312	153.23	1,875	124.27	81.10
20. Akola	..	..	3,738	204.60	2,325	127.26	62.20
21. Amravati	..	..	4,700	252.50	2,497	134.15	53.13
22. Yavatmal	..	..	2,738	157.59	1,232	70.91	45.00
23. Wardha	..	..	2,329	251.34	1,023	110.40	43.92
24. Nagpur	..	..	19,814	765.37	10,606	409.69	53.53
25. Bhandara	..	..	2,214	120.48	1,045	56.87	47.20
26. Chandrapur	..	..	3,250	158.10	1,665	81.00	51.23
Vidarbha	..	..	41,095	286.51	22,268	155.25	54.19
Maharashtra State	..	..	692,359	1,102.76	512,930	816.97	74.08
Maharashtra State (Excl. G.B.)	..	..	200,268	367.19	159,598	292.62	79.69

Literacy

4.43. Finally, we shall consider literacy, which is an important indicator of general development. The relevant data are presented in Table 4.9. In view of the sharp difference that exists between male and female literacy, we shall consider the two separately. For instance, in 1961, considering the State as a whole, excluding Greater Bombay, the literacy percentages were 38.83 per cent for the male population and only 13.72 per cent for

the female population. In 1981, the percentages were 56.03 per cent for the male and 31.16 per cent for the female population. Thus, the gap between the male and female literacy remained the same.

4.44. In the matter of literacy, while the other three regions are more or less on par, Marathwada is seen left far behind. Thus, in 1961, the percentage of male literacy in Western Maharashtra, Vidarbha and Konkan was 42.11, 41.05 and 40.35

Table 4.9. Percentage of Literate Males and Females

District		1961		1981		Increase	
		Males	Females	Males	Females	Males Col. (4) - Col. (2)	Females Col. (5) - Col. (3)
(1)		(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	65.10	48.81	73.93	60.28	8.83	11.47
2. Thane	..	41.09	39.06	59.20	40.19	18.11	21.13
3. Raigad	..	36.37	13.40	57.22	33.95	20.85	20.55
4. Ratnagiri	..	42.16	17.44	59.61	37.99	17.45	20.55
Konkan (Excl. G.B.)	..	**40.35**	**17.05**	**58.76**	**37.79**	**18.41**	**20.74**
5. Nashik	..	39.36	13.71	55.6	31.73	16.24	18.02
6. Dhule	..	37.43	12.45	48.63	25.84	11.20	13.39
7. Jalgaon	..	49.32	18.02	60.95	33.97	11.63	15.95
8. Ahmednagar	..	39.36	13.03	56.43	28.89	17.07	15.86
9. Pune	..	46.18	21.74	65.37	42.11	19.19	20.37
10. Satara	..	47.41	21.16	60.07	36.68	12.66	15.52
11. Sangli	..	41.88	13.64	59.26	33.08	17.38	19.44
12. Solapur	..	36.89	12.60	53.51	26.75	16.62	14.15
13. Kolhapur	..	40.09	12.04	59.60	30.64	19.51	18.60
Western Maharashtra	..	**42.11**	**15.69**	**58.37**	**31.67**	**16.26**	**15.98**
14. Aurangabad	..	28.65	6.67	50.72	19.74	22.07	13.07
15. Parbhani	..	25.27	5.19	44.43	15.34	19.16	10.15
16. Beed	..	24.6	5.27	45.63	17.15	21.03	11.88
17. Nanded	..	24.83	5.16	43.40	15.53	18.57	10.37
18. Osmanabad	..	27.52	6.02	48.69	21.73	21.17	15.71
Marathwada	..	**26.46**	**5.73**	**46.86**	**17.95**	**20.40**	**12.22**
19. Buldhana	..	41.15	12.22	58.76	29.75	17.61	17.53
20. Akola	..	44.81	16.69	59.22	35.00	14.41	18.31
21. Amravati	..	45.91	20.57	60.31	42.15	14.40	21.58
22. Yavatmal	..	35.34	11.27	51.18	26.76	15.84	15.49
23. Wardha	..	43.44	16.98	60.66	40.44	17.22	23.46
24. Nagpur	..	48.06	21.26	63.83	44.80	15.77	23.54
25. Bhandara	..	39.9	8.19	58.24	29.44	18.34	21.25
26. Chandrapur	..	28.52	5.79	46.59	22.26	18.07	16.47
Vidarbha	..	**41.05**	**14.13**	**57.28**	**33.76**	**16.23**	**19.63**
Maharashtra State		**42.04**	**16.76**	**58.65**	**34.63**	**16.61**	**17.87**
Maharashtra State (Excl.G.B.)	..	**38.83**	**13.72**	**56.03**	**31.16**	**17.20**	**17.44**

respectively; in Marathwada, it was only 26.46 per cent. In female literacy, Konkan had a slight lead over the other two regions. In 1963, percentage of female literacy in Konkan, Western Maharashtra and Vidarbha was 17.05, 15.69 and 14.13 respectively; in Marathwada, it was only 5.73 per cent.

4.45. If we examine the position districtwise, the percentage of male literacy in 1961 ranged from 49.32 per cent in Jalgaon to 24.60 per cent in Beed. The percentage of female literacy ranged from 21.74 per cent in Pune to 5.16 per cent in Nanded. In the following, we list the districts in descending order of percentage of male literacy in 1961. In brackets are shown percentages of female literacy.

4.46. Between 1961 and 1981, the male literacy in the State, excluding, Greater Bombay, improved by 17.20 percentage points and the female literacy by 17.44 percentage points. This may be seen from cols. 6 and 7 of the Table. Thus, the gap between male and female literacy has remained about the same. The increase in percentage points in male literacy was 20.40 in Marathwada, 18.41 in Konkan, 16.26 in Western Maharashtra and 16.23 in Vidarbha. Thus, the gap between Marathwada and the other three regions narrowed down a little, but only a little. Konkan made up the small lag and took lead over Western Maharashtra and Vidarbha. The increase in percentage points in female literacy was 20.74 in Konkan, 19.63 in Vidarbha, 15.98 in Western Maharashtra and only 12.22 in Marathwada. Thus, the gap between Marathwada and the other three regions in female literacy widened. Konkan increased its lead over Western Maharashtra and Vidarbha.

list the districts in descending order of male literacy in 1981. In brackets are shown percentages of female literacy:

Above State Average		Below State Average	
Pune	65.37 (42.11)	Nashik	55.60 (31.73)
Nagpur	63.83 (44.80)	Solapur	53.51 (26.75)
Jalgaon	60.95 (33.97)	Yavatmal	51.18 (26.76)
Wardha	60.66 (40.44)	Aurangabad	50.72 (19.74)
Amravati	60.31 (42.15)	Osmanabad	48.69 (21.73)
Satara	60.07 (36.68)	Dhule	48.63 (25.84)
Ratnagiri	59.61 (37.99)	Chandrapur	46.59 (22.26)
Kolhapur	59.60 (30.64)	Beed	45.63 (17.15)
Sangli	59.26 (33.08)	Parbhani	44.43 (15.34)
Akola	59.22 (35.00)	Nanded	43.40 (15.53)
Thane	59.20 (40.19)		
Buldhana	58.76 (29.75)		
Bhandara	58.24 (29.44)		
Raigad	57.22 (33.95)		
Ahmednagar	56.43 (28.89)		

Proportion of Weaker Sections:

4.48. When we examine the process of development sectorally, some of the causes underlying regional inequalities in specific sectors will become evident. However, one circumstance appears to underlie regional inequality in the development in many sectors. It is the concentration of socially disadvantaged and weaker sections in certain districts. In Table 4.10, we give the populations of Scheduled Tribes, Scheduled Castes and Nav-Baudhas and Agricultural labour in different districts expressed as percentages of the total population of the districts. It will be noticed that the Scheduled Tribes constitute 10.43 per cent of population of the State excluding Greater Bombay; Scheduled Castes 7.48 per cent and Nav-Baudhas 6.20 per cent. The three classes put together constitute 24.11 per cent of the population of the State, excluding Greater Bombay. Agricultural labour constitutes 11.92 per cent.

Above State Average		Below State Average	
Jalgaon	49.32 (18.02)	Dhule	37.43 (12.45)
Nagpur	48.06 (21.26)	Solapur	36.89 (12.60)
Satara	47.41 (21.16)	Raigad	36.37 (13.40)
Pune	46.18 (21.74)	Yavatmal	35.34 (11.27)
Amravati	45.91 (20.57)	Aurangabad	28.65 (6.67)
Akola	44.81 (16.69)	Chandrapur	28.52 (5.79)
Wardha	43.44 (16.98)	Osmanabad	27.52 (6.02)
Ratnagiri	42.16 (17.44)	Parbhani	25.27 (5.19)
Sangli	41.88 (13.64)	Nanded	24.83 (5.16)
Buldhana	41.15 (12.22)	Beed	24.60 (5.27)
Thane	41.09 (19.06)		
Kolhapur	40.09 (12.04)		
Bhandara	39.90 (8.19)		
Ahmednagar	39.36 (13.03)		
Nashik	39.36 (13.71)		

4.47. In 1981, the male literacy ranged from 65.37 per cent in Pune to 43.40 in Nanded. Female literacy ranged from 44.80 per cent in Nagpur to 15.34 per cent in Parbhani. In the following, we

4.49. As against the State Average of 24.11 per cent, the districts which have a higher percentage o Scheduled Castes, Scheduled Tribes and Nav-Baudhas are as follows. The figures in brackets indicate the percentage of agricultural labour in the district.

District	Scheduled Castes, Scheduled Tribes and Nav-Baudhas as per cent of total population	
Dhule	46.37	(15.94)
Chandrapur	43.70	(12.71)
Bhandara	38.98	(12.39)
Yavatmal	35.39	(24.65)
Nagpur	35.24	(9.37)
Nashik	34.76	(12.75)
Wardha	33.68	(20.65)
Amravati	32.54	(21.22)
Nanded	31.15	(14.05)
Akola	27.93	(21.59)
Thane	26.17	(4.90)

4.50. In the following districts the percentage of Scheduled Castes, Scheduled Tribes and Nav-Baudhas were lower than the State Average (24.11 per cent).

District	Scheduled Castes, Scheduled Tribes and Nav-Baudhas as per cent of total population	
Buldhana	22.94	(20.52)
Osmanabad	21.82	(14.65)
Parbhani	21.61	(17.54)
Ahmednagar	20.10	(11.88)
Jalgaon	18.78	(16.61)
Raigad	18.37	(5.31)
Solapur	18.12	(11.17)
Aurangabad	17.44	(11.78)
Pune	15.40	(4.53)
Beed	15.06	(12.59)
Sangli	14.96	(7.65)
Kolhapur	13.94	(6.07)
Satara	12.63	(6.85)
Ratnagiri	9.19	(2.82)

4.51. In the following 14 districts, the percentage of agricultural labour in the population is higher than the State average (11.92):

Yavatmal	..	24.65	Dhule	..	15.94
Akola	..	21.59	Osmanabad	..	14.65
Amravati	..	21.22	Nanded	..	14.05
Wardha	..	20.65	Nashik	..	12.75
Parbhani	..	17.54	Chandrapur	..	12.71
Jalgaon	..	16.61	Beed	..	12.59
Buldhana	..	20.52	Bhandara	..	12.39

Scheduled Tribes, Scheduled Castes and Nav-Baudhas are of course, mutually exclusive groups. However, there is likely to be considerable overlap between them and the agricultural labour.

4.52. Problems of development of these several groups are recognised to be different and are being separately attended to by means of special programmes and provisions. However, to the extent these special programmes and provisions have not proved effective to remove the disabilities of these groups, their uneven distribution in different regions or districts appears in the form of regional inequalities in development. This will appear even more so when disparities in development are examined at levels below the district such as the taluka or development block, because of even greater concentration of these groups in certain talukas or blocks. In subsequent discussion of sectoral development in different regions or districts, it will be useful to bear this circumstance in mind.

Table 4.10. Percentage of Scheduled Tribes and Castes, Nav-Baudhas and Agricultural Labourers in 1981

District		Percentage to Total Population			Total Cols. (2) + (3) + (4)	Agricultural Labourers
(1)		Scheduled Tribe (2)	Scheduled Caste (3)	Nav-Baudhas* (4)	(5)	(6)
1. Greater Bombay	..	1.02	4.84	4.76	10.62	0.06
2. Thane	..	21.16	2.50	2.51	26.17	4.90
3. Raigad	..	12.80	1.16	4.41	18.37	5.31
4. Ratnagiri	..	1.50	2.14	5.55	9.19	2.82
Konkan (Excl. G.B.)	..	**13.61**	**2.20**	**3.71**	**19.52**	**4.36**
5. Nashik	..	23.45	6.21	5.10	34.76	12.75
6. Dhule	..	40.53	4.11	1.73	46.37	15.94
7. Jalgaon	..	8.25	5.89	4.64	18.78	16.61
8. Ahmednagar	..	6.93	10.62	2.55	20.10	11.88
9. Pune	..	2.81	7.53	5.06	15.40	4.53
10. Satara	..	0.64	6.21	5.78	12.63	6.85
11. Sangli	..	0.85	11.16	2.95	14.96	7.65
12. Solapur	..	1.98	14.39	1.75	18.12	11.17
13. Kolhapur	..	1.09	12.07	0.78	13.94	6.07
Western Maharashtra	..	**9.36**	**8.65**	**3.49**	**21.50**	**10.11**
14. Aurangabad	..	3.11	6.18	8.15	17.44	11.78
15. Parbhani	..	4.30	5.82	11.49	21.61	17.54
16. Beed	..	0.90	11.47	2.69	15.06	12.59
17. Nanded	..	10.19	11.30	9.66	31.15	14.05
18. Osmanabad	..	2.33	15.45	4.04	21.82	14.65
Marathwada	..	**4.08**	**9.93**	**7.21**	**21.22**	**13.39**
19. Buldhana	..	4.40	6.27	12.27	22.94	20.52
20. Akola	..	6.28	5.51	16.14	27.93	21.59
21. Amravati	..	12.98	6.16	13.40	32.54	21.22
22. Yavatmal	..	21.30	4.88	9.21	35.39	24.65
23. Wardha	..	15.35	3.98	14.35	33.68	20.65
24. Nagpur	..	13.65	7.05	14.54	35.24	9.37
25. Bhandara	..	16.22	9.75	13.01	38.98	12.39
26. Chandrapur	..	26.73	6.53	10.44	43.70	12.71
Vidarbha	..	**14.89**	**6.45**	**12.91**	**34.25**	**17.08**
Maharashtra State	..	**9.19**	**7.14**	**6.47**	**22.80**	**10.36**
Maharashtra State (Excl. G.B.)	..	**10.43**	**7.48**	**6.20**	**24.11**	**11.92**

* Based on 1971 Census.

Annexure
A Note on the Estimation of District Product at Current Prices
by Industry of Origin for the year 1978-79

4A. 1. The note explains in brief the method followed in estimating product at current prices in different sectors by districts in Maharashtra for the year 1978-79.

4A. 2. The Net State Domestic Product (NSDP) is estimated by following income originating approach. It is not computed by adopting income-accruing approach because of certain difficulties at the State level. These difficulties get more pronounced if similar approach is to be followed in the computation of Net Domestic Product at the district level (Briefly referred to as DP in the subsequent paras). Hence an attempt can be made to estimate DP by adopting income-originating approach as at the State level. But even here the process of estimation of DP is be set with certain difficulties. Just as the operating surplus generated in railways, communications and the like, whose activities extend beyond one State, is not conceptually assignable to a particular State and, with the same logic, to a particular district within the State, similarly the operating surplus of industries like MSRTC and MSEB, the activities of which are spread in different districts, cannot be conceptually allocated to a particular district. Such income which cannot be conceptually allocated is considered as unallocable income. The remaining component of income, therefore, constitutes, conceptually allocable income or one which can be considered to be originating in districts.

4A. 3. The product which can thus be considered to have originated in districts can be classified into three categories:

(i) The product which can be estimated by using data actually forthcoming at the district level (e.g., districtwise estimation of value of principal crops or calculation of value added from registered manufacturing); (ii) the product which cannot be computed for want of requisite district data, but which can be assigned to the district by allocating NSDP on the basis of a suitable indicator or by adopting a State level norm uniformly for all districts; and (iii) the product which is assignable to the district but which cannot be assigned for want of State level norm suitable indicator or because of the typical nature of the method of estimation adopted at the State level.

4A. 4. The sectors of the district economy have been classified into two broad groups, viz., A-the commodity producing sectors and B-the non-commodity producing sectors, keeping in view the methods broadly adopted in the estimation of product from these sectors. The output method is generally adopted in the former group whereas the income method is used in the latter. The first group is taken to cover the following sectors:

    I) Agriculture, Animal Husbandry and Allied Activi-
   II) ties,
  III) Forestry,
  IV) Fishing,
   V) Mining,
  VI) Manufacturing: Registered,
 VII) Manufacturing: Unregistered; and
       Electricity, Gas and Water Supply.

The second group covers the remaining sectors, viz.

 VIII) Construction,
  IX) Transport, Storage and Communications,
   X) Trade, Hotels and Restaurants,
  XI) Banking and Insurance,
  XII) Real Estate, Ownership of Dwellings and
      Business Services,
 XIII) Public Administration; and
 XIV) Other Services (including Education).

4A. 5. The districtwise estimates for commodity producing sectors and for non-commodity producing sectors along with their totals have been presented in Statement No. 2 appended to the note. It is to be noted here that as the districtwise estimates from non-commodity producing sectors are largely based on the assignable part of NSDP allocated to districts on the basis of certain indicators State level norms, the districtwise differences may not get appropriately reflected in the estimates so prepared.

4A. 6. The procedure of estimation adopted for each sector is given below:

I. Agriculture, Animal Husbandry and Allied Activities

4A. 7. *Agriculture:* The value added from this sector is computed by deducting value of inputs (including depreciation) from the gross value of output. For purposes of valuation, the sector is divided into (i) principal crops, (ii) crops for which only area figures are available, (iii) products and (iv) by - products. The value of principal crops, other crops, products and by-products are taken together to arrive at the gross value of agriculture (proper) of each district. The data on area, outturn and prices are generally available districtwise for all the principal crops which number 31. These crops account for about 70 per cent of the total gross value from agriculture (proper).

4A. 8. There are 17 crops for which only area figures are available. The share of the value of these crops in the total gross value is about 17 per cent. The values of these crops, based on the output estimated by using pilot survey result / *ad hoc* norms, and prices have been allocated to different districts in proportion to districtwise area figures in respect of these crops.

4A. 9. There are three products, viz., gur, grass and farmyard wood, which account for about 4 per cent of the gross value from agriculture (proper).

4A. 10. The divisional level value of sugarcane and gur has been apportioned to districts in the concerned division on the basis of districtwise sugarcane output, assuming the same proportion of sugarcane and gur at the divisional level for each district.

4A. 11. The State level values of grass and farmyard wood have been allocated to the districts on the basis of the districtwise area figures obtained from land utilisation statistics, assuming the same yield rate as at the State level in all the districts.

4A. 12. As regards by-products (with a share of about 9 per cent in gross value) the State level values of straw in respect of different crops have been allocated to different districts on the basis of areas of the concerned crops.

4A. 13. The values of remaining by-products in respect of tobacco, rice, gur and sugarcane have been allocated to different districts or, the basis of the output of the concerned agricultural commodities.

4A. 14. *Animal Husbandry:* The estimates of gross value from animal husbandry sector for the year 1978-79 have been allocated to different districts according to the procedure outlined below:

4A. 15. *Milk and Milk Products:* The data on output and value of milk procured by Government Dairies have been assumed to constitute the organised part of total milk production at the district level. The value of rest of the milk production available separately for she-buffaloes and cows from the Directorate of Animal Husbandry at the divisional level has been allocated to the districts in the concerned divisions on the basis of the number of milch animals of each category. The State level value of goat milk has been distributed among districts in proportion to the districtwise number of milch goats.

4A. 16. The State level value of milk products has been distributed on the basis of the total value of milk production, organised and un-organised together, arrived at, at the district level.

4A. 17. *Meat and Meat Products:* The State level values of these products have been allocated to districts on the basis of the number of slaughtered animals of different categories.

4A. 18. *Wool, Goat hair and Pig bristles:* The State level values of these products have been allocated to districts on the basis of the total number of animals in the respective categories according to the Livestock Census, 1978.

4A. 19. *Value of dung:* The State level value has been distributed according to the total bovine population based on the Livestock Census, 1978.

4A. 20. *Products of poultry birds and incre-*

ment in livestock and poultry: The State level values have been distributed among districts using the relevant data on the number of birds / animals from the Livestock Census, 1978.

4A. 21. *Allied Activities:* The net product from the operation of Government irrigation schemes has been allocated to districts on the basis of area irrigated by Government canals.

4A. 22. The State level value of veterinary services and other allied activities has been allocated to districts on the basis of districtwise data on working force.

4A. 23. *Inputs in Agriculture including Animal Husbandry:* The State level values of inputs in agriculture and animal husbandry sectors have been allocated to different districts by using the indicators mentioned below:

Item		Indicator
i)	Seed ..	The State level values have been allocated to different districts on the basis of area / value of output of the concerned crops, assuming the same seed rate for all districts.
ii)	Chemical Fertilisers ..	The State level values have been allocated to different districts on the basis of the seasonwise consumption of NPK nutrients by districts made available for Maharashtra State in the publication, 'Fertiliser Statistics' for 1979-80.
iii)	Pesticides and Insecticides ..	The State level values have been allocated to different districts following the pattern of districtwise seasonwise consumption of NPK nutrients in 1978-79.
iv) Organic manure v) Current repairs and maintenance and other operational costs and depreciation.	}	The State level values of these inputs have been distributed according to districtwise gross cropped area for the year 1978-79.
vi)	Livestock Feed ..	The State level value has been allocated to different districts on the basis of number of working animals in each district.
vii)	Irrigation charges ..	The districtwise area irrigated by Government canals has been taken as the basis for distributing the State level values of irrigation charges among districts.
viii)	Market Charges ..	The State level value of market charges has been apportioned to districts on the basis of districtwise gross values of agriculture (proper).
ix)	Electricity ..	The districtwise number of electric pumps according to Livestock Census, 1978 has been used for allocating the State level value of electricity to different districts.
x)	Diesel Oil ..	The districtwise number of oil engines used for agricultural purposes and the districtwise number of tractors, according to Livestock Census, 1978 have been used to allocate the State level value of diesel oil to different districts.
xi)	Rice milling charges ..	The State level value of rice milling charges has been allocated to districts on the basis of districtwise output of rice.

4A.24. *Adjustment for Seasonal Variation:* It was considered desirable that to enable one to make inter-district comparison adjusted for seasonal variations the total DP should be estimated as an average for three years. But time was not available for estimating the DP for three years and seasonal adjustment could be done only for the sector of agriculture (proper). Even while considering the three years average it would have been desirable to use a continuous period of three years of which the year 1978-79 formed the centre. However, since the estimates for 1977-78 were not available by the revised method of estimation, *i.e.,* the method that has been used in preparing the State level estimates, it became necessary to use the average for three years 1978-79, 1979-80 and 1980-81.

4A.25.For these three years the average of gross values of agricultural production (proper) for every district was worked out, and the gross value of agriculture (proper) for the year 1978-79 originally prepared by the above method of estimation at the State level was distributed over the districts in proportion to the three years averages for 1978-79 to 1980-81. This ensured that the State level estimate for 1978-79 was held constant but the differences in the seasonal variation in different districts were averaged out in the process. This was the best that could be done under the circumstances. The calculations in this behalf are shown in the Statement No. 1 in Cols. 2, 3, 4 and 5. As a result though the districtwise estimates are called as estimates referring to 1978-79, in respect of the sector of agriculture (proper) they refer to the three years average.

4A.26. After determining the gross value of agriculture proper in this manner, the gross value of the animal husbandry sector shown in Col. (6) was added to it to arrive at the total gross value of agriculture and animal husbandry shown in col. (7) of the Statement No. 1. The Statement further shows the value of inputs for 1978-79, and the net product from agriculture and animal husbandry sectors together (col. 9). After adding to this the net product from allied activities, the net DP in the sector of agriculture, animal husbandry and allied activities was obtained (col. 11). These figures are shown in col. (2) of Statement No. 2 and used for estimating the DP from all sectors together.

II. Forestry:

4A.27. The data on districtwise values of major forest produce, comprising timber and fuel wood, for the year 1978-79 have been reported by the Office of Forest Statistician (OFS), Maharashtra State, Pune. They have been used to show the districtwise values of timber and fuel wood. In respect of minor forest produce, the State level value reported by OFS is allocated to different districts on the basis of the districtwise forest area. No adjustment has been done to account for non-reported component of major and minor forest produce at the district level. The input norms used at the State level have been adopted for all districts.

III. Fishing:

4A.28. The State level value added from the activity of marine fishing including that of collection of pearls and chanks, has been allocated to four districts, viz., Greater Bombay, Thane, Raigad and Ratnagiri, on the basis of the districtwise values reported by the Directorate of Fisheries (DF), in respect of the activity concerning fresh fish, salted fish and sun dried fish constituting the marine fishing activity. As regards inland fishing, the State level value added has been allocated to different districts on the basis of the districtwise values of inland fish production reported by the DF for the year 1978-79. In the absence of similar data, the value added from subsistence fishing has been distributed among different districts following the trends in values of inland fishing reported for different districts by the DF. The State level input norms have been assumed for all districts.

IV. Mining:

4A.29. The districtwise data on values of major minerals supplied by the Directorate of Geology and Mining (DGM), Nagpur, for the calendar year 1978 have been used as the basis for distribution of State level values of major minerals supplied by Indian Bureau of Mines, Nagpur, for the financial year 1978-79 among the concerned districts. As regards minor minerals, the State level value for 1978-79 has been distributed among the districts in the proportion of districtwise values of minor minerals reported for the year 1976 by the DGM, Nagpur. The State level input norms have been applied to district-wise values to arrive at the net income, in the absence of similar norms at the district level.

V. Manufacturing: Registered

4A.30. The data on districtwise value added by manufacture are compiled by availing of results of the Annual Survey of Industries for 1978-79. They have not been adjusted for non-reporting industries at the district level.

VI. Manufacturing: Un-registered

4A.31. The State level value added from this sector has been distributed among the districts in the proportion of districtwise employees from manufacturing sector according to the Economic Census, 1980, after making due adjustment for districtwise employment in registered factory sector.

VII. Electricity, Gas and Water Supply:

4A.32. *Electricity:* The NSDP from this sector consists of wages and salaries and operating surplus. The former component, viz., wages and salaries, could not be allocated to different districts as the district, wise position of staff / emoluments in respect of major electricity companies is not available. The latter component, viz., the operating surplus, being conceptually unallocable, has not been allocated to districts.

with the result that the whole of NSDP (Rs. 211 crore) in electricity sector has remained unallocated.

4A.33. *Gas:* The NSDP from gas sector (Rs. 1 crore) has been allocated to Greater Bombay Dist., as the Bombay Gas Co. is located in Bombay.

4A.34. *Water Supply:* The NSDP from this sector has been allocated to different districts in the proportion of districtwise number of workers according to 1971 Population Census. The NSDP is Rs. 18 crore constituting 0.17 per cent of the State income.

VIII. Construction:

4A.35. It has not been possible to have a districtwise break-up of NSDP originating in this sector because of the typical nature of the method of estimation adopted at the State level. So the NSDP of Rs. 561 crore originating in construction sector has not been allocated to districts. Its share in the total NSDP is about 5 per cent.

IX. Transport, Storage and Communications:

4A.36. *Transport:* As regards railways, the State level income has been split into two components, viz., wages and salaries and operating surplus, by adopting All-India ratio for the year 1978-79. Where as the operating surplus (Rs. 33 crore) is conceptually unallocable and hence has not been allocated to districts, the portion of wages and salaries (Rs. 74 crore) has been distributed among districts in the proportion of districtwise number of workers according to 1971 Population Census.

4A.37. The NSDP of Rs. 50 crore from Air Transport has not been allocated as the data required for splitting the NSDP into emoluments and operating surplus are not available.

4A.38. The NSDP from Road Transport (Rs. 237 crore) has been divided into organised part and unorganised part. The former consists of transport companies like, MSRTC, BEST, PMT, KMT and SMT. The NSDP from all the companies except MSRTC has been allocated to concerned districts in which those companies are located. In respect of MSRTC, while the component of operating surplus (about Rs. 8 crore) has hot been allocated, the component of wages and salaries (about Rs. 38 crore) has been assigned to districts in the proportion of districtwise staff working in MSRTC.

4A.39. The NSDP from unorganised part has been distributed among districts following the proportions of districtwise number of workers according to 1971 Population Census.

4A.40. The water transport too consists of organised and unorganised segments. The former comprises BPT and Shipping Companies. The NSDP (Rs. 88 crore) relating to this segment has been allocated to Greater Bombay district. The NSDP from unorganised part (Rs. 11 crore) has been allocated to districts on the basis of the working force proportions according to 1971 Population Census.

4A.41. The NSDP originating in 'Services incidental to transport' has been allocated to districts by using the district proportions of working force from the concerned transport category according to 1971 Population Census.

4A. 42. *Storage:* As the data on staff and emoluments and operating surplus of Maharashtra State Warehousing Corporation are not available districtwise, the NSDP generated from its activity has been treated as unallocable. The residual component of NSDP from this sector has also not been distributed for want of relevant districtwise data.

4A. 43. *Communications:* The NSDP originating in this sector has been first apportioned into wages and salaries and operating surplus by using All-India ratios of these two components. The portion of emoluments has been distributed among districts in the proportion of districtwise working force figures according to 1971 Population Census. The operating surplus (Rs. 60 crore) has been treated as unallocable.

X. Trade, Hotels and Restaurants:

4A. 44. The districtwise working force data in these sectors, collected in the Economic Census, 1980 have been used as the basis for allocating NSDP to different districts.

XI. Banking and Insurance:

4A. 45. After splitting up the NSDP generated in these sectors into emoluments and operating surplus by adopting All-India ratios, the former has been allocated to districts following the districtwise number of workers in these sectors according to Economic Census 1980, while the latter has been treated as unallocable.

XII. Real Estate, Ownership of Dwellings and Business Services:

4A. 46. *Real Estate:* The NSDP has been allocated to districts according to the distribution of working force in the districts as per the Population Census, 1971.

4A. 47. *Ownership of Dwellings:* The urban and rural rentals have been allocated to different districts in the proportion of urban and rural occupied residential houses respectively in different districts according to the provisional results of the Population Census, 1981.

XIII. & XIV. Public Administration and Other Services:

4A. 48. In the case of Public Administration, including Central Government administration, business services and sanitary services the basis of allocation of NSDP has been the districtwise

working force in the concerned categories of activity according to the Population Census, 1971. The districtwise working force according to the Economic Census 1980 has been adopted as the basis for allocation of NSDP to different districts in respect of other services.

4A.49. The Sectorwise position indicating the estimated and unestimated components of NSDP is shown below. The NSDP of Maharashtra at current prices is Rs. 10,632 crore for the year 1978-79. Of this, Rs. 9,276 crore (about 87 per cent) has been estimated districtwise and the balance of Rs. 1,356 crore (about 13 per cent) could not be estimated mainly due to conceptual problem.

Sectorwise Position Indicating the Estimated and
Unestimated Components of NSDP Districtwise 1978-79

(Rs in crore)

Sector	Total NSDP	Estimated District-wise	Not Estimated District-wise
(1)	(2)	(3)	(4)
1. Agriculture	2,771	2,771	..
2. Forestry and Logging	117	46	71*
3. Fishing	82	82	..
4. Mining and Quarrying	25	25	..
5. Manufacturing Registered	2,263	2,241	22*
6. Manufacturing Unregistered	638	638	..
7. Construction	561	..	561**
8. Electricity	211	..	211
9. Gas and Water Supply	19	19	..
10. Railways	107	74	33
11. Air Transport	50	..	50
12. Transport by other means and Storage	338	328	10
13. Communications	142	82	60
14. Trade, Hotels and Restaurants	1,509	1,509	..
15. Banking and Insurance	650	312	338
16. Real Estate and Ownership of Dwellings	187	187	..
17. Business Services	74	74	..
18. Public Administration	283	283	..
19. Other Services	605	605	..
Total	10,632 (100.00)	9,276 (87.25)	1,356 (12.75)

Col. 4
* Due to non-reporting component at the State level.
** Cannot be estimated at the district level due to particular method that could be followed at the State level
†† Partly due to lack of data and partly due to conceptual problem. The rest could not be estimated due to conceptual problem.

4A. 50. Of the DP of Rs. 9,276 crore, that estimated by an appropriate method of allocation to the districts is as follows for different sectors:

Table showing Net State Domestic Product (NSDP)
Assigned to Districts in Maharashtra Using Indicators
(1978-79)

Sector (1)	NSDP (Rs. in Crore) (2)
1. Allied Activities* in Agriculture Sector	63.21
2. Manufacturing un-registered	638.32
3. Water Supply	17.84
4. Railways	74.09
5. Transport by other means	224.28
6. Communications	81.48
7. Trade, Hotels and Restaurants	1,509.22
8. Banking and Insurance	312.50
9. Real estate and Ownership of dwellings	187.07
10. Business Services	74.41
11. Public Administration	282.97
12. Other Services	604.47
Total	4,069.86

(* They comprise net product from -
i) Operation of Government irrigation systems,
ii) Veterinary Services,
iii) The activities relating to production of honey and wax, cocoons and raw silk, etc., and
iv) Hunting and trapping.)

4A.51. The part of the NSDP allocated by using indicators is Rs. 4,070 crore, which accounts for about 44 per cent of the allocable component of NSDP of Rs. 9,276 crore and about 38 per cent of total NSDP of Rs. 10,632 crore, in 1978-79. Trade, unregistered manufacturing and other services are the major sectors whose Net State Domestic Product accounts for about 68 per cent of the indicator based product, (i.e., Rs. 4,070 crore).

4A.52. The Table above does not cover agriculture (proper) and animal husbandry sectors in respect of which State level and/or regional level gross values of certain components have been allocated to districts by using indicators. Those components relate to miscellaneous crops, (i.e., other than principal crops), products and by-products in Agriculture (proper) and milk, live-stock products, etc., in Animal Husbandry.

STATEMENT 1.
Net State Domestic Product from Agriculture by Districts based on Gross Value
of Agriculture (Proper) adjusted for seasonal variations

(Rs. in Lakh)

District	Gross Value of Agriculture (proper) for 1978-79 (originally prepared)	Average of Gross Values of Agriculture (proper) for 1978-79 to 1980-81	Percentage of figure to Total in Col. (3)	Distribution of State Level GVA* for 1978-79 According to percentages in Col. (4)	Gross Value of Animal Husbandry
(1)	(2)	(3)	(4)	(5)	(6)
1. Greater Bombay	142	146	0.04	118	10,406
2. Thane	6,447	6,980	2.09	6,142	2,146
3. Raigad	5,913	6,465	1.94	5,701	1,450
4. Ratnagiri	10,601	11,113	3.33	9,786	2,046
Konkan (Excl. G.B.)	**22,961**	**24,558**	**7.36**	**21,629**	**5,642**
5. Nashik	17,553	17,725	5.30	15,575	2,786
6. Dhule	9,791	11,031	3.30	9,697	3,176
7. Jalgaon	23,658	24,686	7.39	21,716	2,869
8. Ahmednagar	17,027	21,784	6.52	19,160	3,008
9. Pune	15,701	19,603	5.87	17,250	4,977
10. Satara	11,055	13,368	4.00	11,754	2,665
11. Sangli	11,976	13,306	3.98	11,696	3,162
12. Solapur	13,346	15,036	4.50	13,224	2,858
13. Kolhapur	13,919	17,196	5.15	15,134	4,263
Western Maharashtra	**134,026**	**153,735**	**46.01**	**135,206**	**29,764**
14. Aurangabad	16,510	18,414	5.51	16,192	1,919
15. Parbhani	13,024	14,769	4.42	12,989	1,622
16. Beed	9,311	11,038	3.30	9,697	1,677
17. Nanded	9,376	10,896	3.26	9,580	1,781
18. Osmanabad	17,018	18,209	5.45	16,015	2,502
Marathwada	**65,239**	**73,326**	**21.94**	**64,473**	**9,501**
19. Buldhana	9,704	11,729	3.51	10,315	1,298
20. Akola	8,194	10,530	3.15	9,257	1,755
21. Amravati	10,557	12,114	3.63	10,667	1,419
22. Yavatmal	9,632	11,904	3.56	10,461	1,677
23. Wardha	6,586	7,391	2.21	6,494	890
24. Nagpur	8,892	9,103	2.72	7,993	1,650
25. Bhandara	8,277	8,857	2.65	7,787	1,221
26. Chandrapur	9,652	10,749	3.22	9,462	1,746
Vidarbha	**71,494**	**82,377**	**24.65**	**72,436**	**11,656**
Maharasatra State	**293,862**	**334,142**	**100.00**	**293,862**	**66,969**
Maharashtra State (Excl G. B.)	**293,720**	**333,996**		**293,744**	**56,563**

* GVA : Gross Value of Agriculture (Proper).

STATEMENT 1. (Concld.)

(Rs. in Lakh)

District	Total Gross Value of Agriculture and Animal Husbandry (Col. 5 + Col. 6)	Total Inputs	Net Product from Agriculture (Proper) and Animal Husbandry (Col. 7 - Col.8)	Net Product from Allied Activities	Net S.D.P. from Agriculture (Col. 9 + Col.10)
(1)	(7)	(8)	(9)	(10)	(11)
1. Greater Bombay	10,524	16	10,508	6	10,514
2. Thane	8,288	2,220	6,068	8	6,076
3. Raigad	7,151	2,027	5,124	75	5,199
4. Ratnagiri	11,832	3,419	8,413	17	8,430
Konkan (Excl. G. B.)	27,271	7,666	19,605	100	19,705
5. Nashik	18,361	5,202	13,159	399	13,558
6. Dhule	12,873	4,021	8,852	256	9,108
7. Jalgaon	24,585	5,059	19,526	288	19,814
8. Ahmednagar	22,168	5,961	16,207	861	17,068
9. Pune	22,227	4,414	17,813	912	18,725
10. Satara	14,419	2,968	11,451	347	11,798
11. Sangli	14,858	3,055	11,803	168	11,971
12. Solapur	16,082	3,869	12,213	453	12,666
13. Kolhapur	19,397	4,472	14,925	22	14,947
Western Maharashtra	164,970	39,021	125,949	3,706	129,655
14. Aurangabad	18,111	5,171	12,940	379	13,319
15. Parbhani	14,611	3,617	10,994	116	11,110
16. Beed	11,374	3,008	8,366	82	8,448
17. Nanded	11,361	2,800	8,561	123	8,684
18. Osmanabad	18,517	4,121	14,396	215	14,611
Marathwada	73,974	18,717	55,257	915	56,172
19. Buldhana	11,613	3,129	8,484	43	8,527
20. Akola	11,012	2,995	8,017	49	8,066
21. Amravati	12,086	2,899	9,187	24	9,211
22. Yavatmal	12,138	3,429	8,709	85	8,794
23. Wardha	7,384	1,849	5,535	55	5,590
24. Nagpur	9,643	2,870	6,773	164	6,937
25. Bhandara	9,008	3,223	5,785	702	6,487
26. Chandrapur	11,208	4,265	6,943	473	7,416
Vidarbha	84,092	24,659	59,433	1,595	61,028
Maharashtra State	360,831	90,079	270,752	6,322	277,074
Maharashtra State (Excl. G.B.)	350,301	90,063	260,244	6,316	266,560

Note :
i) The Statement is to be read along with the covering Note.
ii) The Statement is based on the set of estimates of NSDP at current prices presented in the Economic Survey of Maharashtra, 1982-83.

STATEMENT 2.
Net State Domestic Product from Commodity and Non-Commodity Producing Sectors by Districts 1978-79
(At Current Prices)

(Rs. in Lakh)

	District (1)	Agriculture (2)	Forestry (3)	Fishing (4)	Mining (5)
1.	Greater Bombay	10,514	..	3,322	4
2.	Thane	6,076	524	2,274	103
3.	Raigad	5,199	102	486	3
4.	Ratnagiri	8,430	52	868	329
Konkan (Excl. G.B.)		**19,705**	**678**	**3,628**	**435**
5.	Nashik	13,558	341	12	1
6.	Dhule	9,108	204	18	1
7.	Jalgaon	19,814	54	6	1
8.	Ahmednagar	17,068	27	12	*
9.	Pune	18,725	29	236	4
10.	Satara	11,798	23	46	*
11.	Sangli	11,971	11	30	*
12.	Solapur	12,666	5	31	1
13.	Kolhapur	14,947	47	76	55
Western Maharashtra		**129,655**	**741**	**467**	**63**
14.	Aurangabad	13,319	13	63	1
15.	Parbhani	11,110	6	42	*
16.	Beed	8,448	3	44	*
17.	Nanded	8,684	51	40	*
18.	Osmanabad	14,611	..	24	*
Marathwada		**56,172**	**73**	**213**	**1**
19.	Buldhana	8,527	30	12	*
20.	Akola	8,066	32	25	3
21.	Amravati	9,211	634	18	1
22.	Yavatmal	8,794	407	47	77
23.	Wardha	5,590	58	30	1
24.	Nagpur	6,937	224	45	955
25.	Bhandara	6,487	330	174	233
26.	Chandrapur	7,416	1,392	170	756
Vidarbha		**61,028**	**3,107**	**521**	**2,026**
Maharasht ra State		**277,074**	**4,599**	**8,151**	**2,529**
Maharashtra State (Excl. G. B.)		**266,560**	**4,599**	**4,829**	**2,525**

* Negligible.

(Contd.)

STATEMENT 2. *(Contd.)*

(Rs. in Lakh)

District	Registered Manufacturing	Un-registered Manufacturing	Gas & Water Supply	Total
(1)	(6)	(7)	(8)	(9)
1. Greater Bombay	126,474	9,977	519	150,810
2. Thane	45,308	6,027	131	60,443
3. Raigad	4,270	1,005	45	11,110
4. Ratnagiri	175	1,295	24	11,173
Konkan (Excl. G.B.)	**49,753**	**8,327**	**200**	**82,726**
5. Nashik	3,098	3,084	61	20,155
6. Dhule	739	1,289	30	11,389
7. Jalgaon	1,639	1,699	45	23,258
8. Ahmednagar	2,448	2,754	57	22,366
9. Pune	21,795	3,836	272	44,897
10. Satara	1,331	1,711	45	14,954
11. Sangli	1,812	1,930	49	15,803
12. Solapur	2,496	4,414	59	19,672
13. Kolhapur	2,725	4,253	126	22,229
Western Maharashtra	**38,083**	**24,970**	**744**	**194,723**
14. Aurangabad	1,228	1,512	31	16,167
15. Parbhani	62	1,091	71	12,382
16. Beed	36	959	52	9,542
17. Nanded	536	1,094	28	10,433
18. Osmanabad	244	1,383	20	16,282
Marathwada	**2,106**	**6,039**	**202**	**64,806**
19. Buldhana	151	856	28	9,604
20. Akola	998	1,115	22	10,261
21. Amravati	504	1,064	36	11,468
22. Yavatmal	273	987	24	10,609
23. Wardha	621	741	11	7,052
24. Nagpur	3,077	3,530	71	14,839
25. Bhandara	498	4,604	4	12,330
26. Chandrapur	1,566	1,622	28	12,950
Vidarbha	**7,688**	**14,519**	**224**	**89,113**
Maharashtra State	**224,104**	**63,832**	**1,889**	**582,178**
Maharashtra State (Excl. G.B.)	**97,630**	**53,855**	**1,370**	**431,368**

(Contd.)

STATEMENT 2. *(Contd.)*

(Rs. in Lakh)

District	Transport and Storage	Communication	Trade, Hotels and Restaurants	Banking and Insurance	Ownership of Dwellings, Real Estate, Business Services
(1)	(10)	(11)	(12)	(13)	(14)
1. Greater Bombay	20,499	3,142	51,081	17,213	8,675
2. Thane	2,003	554	8,525	992	1,364
3. Raigad	432	114	2,690	330	450
4. Ratnagiri	489	244	2,980	407	594
Konkan (Excl. G. B.)	**2,924**	**912**	**14,195**	**1,729**	**2,408**
5. Nashik	1,271	272	5,176	854	882
6. Dhule	471	125	3,279	384	579
7. Jalgaon	1,193	281	4,810	544	813
8. Ahmednagar	571	224	4,461	634	795
9. Pune	2,696	681	11,220	2,448	1,445
10. Satara	746	177	3,386	646	640
11. Sangli	722	151	3,381	711	581
12. Solapur	966	212	6,404	747	847
13. Kolhapur	899	181	4,888	1,012	811
Western Maharashtra	**9,535**	**2,304**	**47,005**	**7,980**	**7,393**
14. Aurangabad	533	128	3,461	443	751
15. Parbhani	287	74	2,658	249	556
16. Beed	244	68	1,990	156	441
17. Nanded	344	79	3,031	328	524
18. Osmanabad	321	106	3,368	331	644
Marathwada	**1,729**	**455**	**14,508**	**1,507**	**2,916**
19. Buldhana	327	74	2,338	234	478
20. Akola	729	158	3,077	440	613
21. Amravati	689	157	3,117	415	628
22. Yavatmal	370	98	2,561	181	472
23. Wardha	356	63	1,499	198	317
24. Nagpur	2,112	595	6,603	1,022	1,019
25. Bhandara	498	104	2,703	158	551
26. Chandrapur	438	86	2,235	173	678
Vidarbha	**5,519**	**1,335**	**24,133**	**2,821**	**4,756**
Maharashtra State	**40,206**	**8,148**	**1,50,922**	**31,250**	**26,148**
Maharashtra State (Excl. G.B.)	**19,707**	**5,006**	**99,841**	**14,037**	**17,473**

(Contd.)

STATEMENT 2. *(Concld.)*

(Rs. in Lakh)

District	Public Admini- stration	Other Services	Total	Grand Total Col. 9 + Col. 17	Population "000"	Per Capita in (Rs.) Col. 18
(1)	(15)	(16)	(17)	(18)	(19)	Col. 19 (20)
1. Greater Bombay	6,649	13,803	121,062	271,872	7,749	3,508
2. Thane	1,282	3,208	17,928	78,371	3,142	2,494
3. Raigad	518	1,121	5,655	16,765	1,400	1,197
4. Ratnagiri	863	1,980	7,557	18,730	1,984	944
Konkan (Excl. G.B.)	2,663	6,309	31,140	113,866	6,526	1,745
5. Nashik	1,314	2,268	12,037	32,192	2,811	1,145
6. Dhule	655	1,513	7,006	18,395	1,931	952
7. Jalgaon	806	2,097	10,544	33,802	2,469	1,369
8. Ahmednagar	1,093	2,169	9,947	32,313	2,551	1,267
9. Pune	3,627	4,732	26,849	71,746	3,922	1,830
10. Satara	890	1,917	8,402	23,356	1,920	1,217
11. Sangli	635	1,759	7,940	23,743	1,719	1,381
12. .Solapur	811	2,600	12,587	32,259	2,457	1,313
13. Kolhapur	885	2,156	10,832	33,061	2,351	1,406
Western Maharashtra	10,716	21,211	106,144	300,867	22,131	1,360
14. Aurangabad	968	1,468	7,752	23,919	2,298	1,041
15. Parbhani	518	1,018	5,360	17,742	1,719	1,032
16. Beed	376	830	4,105	13,647	1,400	975
17. Nanded	423	1,129	5,858	16,291	1,648	988
18. Osmanabad	557	1,755	7,082	23,364	2,097	1,114
Marathwada	2,842	6,200	30,157	94,963	9,162	1,036
19. Buldhana	523	1,255	5,229	14,833	1,417	1,047
20. Akola	583	1,491	7,091	17,352	1,719	1,010
21. Amravati	605	1,667	7,278	18,746	1,748	1,072
22. Yavatmal	480	1,191	5,353	15,962	1,636	976
23. Wardha	490	880	3,803	10,855	874	1,242
24. Nagpur	1,574	3,950	16,875	31,714	2,433	1,304
25. Bhandara	459	1,325	5,798	18,128	1,731	1,047
26. Chandrapur	713	1,165	5,488	18,438	1,937	952
Vidarbha	5,427	12,924	56,915	146,028	13,495	1,082
Maharashtra State	28,297	60,447	345,418	927,596	59,063	1,570
Maharashtra State (Excl. G.B.)	21,648	46,644	224,356	655,724	51,314	1,278

Note :-
i) The Statement is to be read along with the covering Note.
ii) Totals may not add up due to rounding of figures.
iii) The Statement is based on the set of estimates of NSDP at current prices presented in the Economic Survey of Maharashtra, 1982-83.

IRRIGATION FROM SURFACE WATER RESOURCES

Surface Water Resources of Maharashtra:

7.1. The first assessment of the surface water resources of Maharashtra State and their utilisation was done by the Maharashtra State Irrigation Commission (1962). This is given in Table 7.1. It shows, for each basin / sub-basin, its culturable area (Col. 2), 75 per cent dependable water resources (Col. 3), utilisable water resources (Col. 4), culturable command (Col. 5), irrigable command (Col. 6); in the last two columns are given irrigation area per MCft. and irrigable area expressed as per cent of total culturable area. These estimates are based on the Master Plans prepared by the Water Resources Investigation Circle until 1961.

7.2. The estimates have been revised and updated departmentally from time to time. Master Plans for Krishna and Godavari basins were approved by the Government in January 1971. Thereafter, Water Disputes Tribunal has given its Decision regarding Krishna basin in May 1976 and for Godavari basin in July 1980 modifying the water availability of Maharashtra. Consequent sub-basinwise revised Master Plans for Krishna and Godavari are presently under preparation. Master Plans for the Konkan rivers were prepared in March 1981. Master Plan for Maharashtra area of Tapi basin was prepared in January 1982. While approving the Ukai Project on Tapi river in Gujarat, the Government of India has reserved 262 TMC water for upstream use in Maharashtra and Madhya Pradesh. Maharashtra's share is to be decided after discussions with Madhya Pradesh. In Table 7.2 we give on the basis of present assessment (1982), basin-wise estimates or utilisable water resources and planned water use of major, medium and minor (State Sector) projects completed and under construction.

Ultimate Irrigation Potential:

7.3. The Maharashtra State Irrigation Commission (1962) had assessed the total irrigation

potential of Maharashtra through surface water resources at 52.61 lakh hectares. A recent assessment (1979), made in connection with the appraisal of Maharashtra's irrigation projects by the World bank, places the ultimate potential at 61.93 lakh hectares. This is tentative and subject to revision. For our purpose, its merit is that it is available broken up by districts. Hence, we shall give it for information. However, our assessment of the district backlog in irrigation does not depend upon any assessment of ultimate irrigation potential.

The River Basins:

7.4. Maharashtra State is divided into five river basins, namely, the Konkan rivers, Tapi, Narmada, Krishna, and Godavari. Among these, the Konkan rivers, and Tapi and Narmada are west flowing rivers; Krishna and Godavari are east flowing rivers. In the following are shown the districts or parts of districts (percentages indicated in brackets) lying within each basin :

Basin	Districts
Konkan Rivers	.. Thane, Raigad, Ratnagiri-Sindhudurg.
Tapi	.. Amravati(65.7%), Akola (64.7%), Buldhana (60.4%), Jalgaon, Dhule (88.5%), Nashik (52.8%), Aurangabad-Jalna (7.0%).
Narmada	.. Dhule (11.5%).
Krishna	.. Pune, Solapur, Satara, Sangli, Kolhapur, Ahmednagar (36.2%), Beed (14.2%), Osmanabad-Latur (31.8%).
Godavari	.. Nashik (47.8%), Ahmednagar (63.8%), Aurangabad-Jalna (93.0%), Beed (85.8%), Osmanabad-Latur (68.2%), Nanded, Parbhani, Buldhana (39.6%), Akola (35.3%), Amravati (34.3%), Yavatmal, Wardha, Nagpur, Bhandara, Chandrapur-Gadchiroli.

Irrigation Potential achieved by June 1960 and June 1982:

7.5. We shall begin by presenting data on irrigation potential created in different districts as on 30th June 1960 and, 22 years later, as or 30th

June 1982. This covers the major, medium and State and Local Sector minor irrigation works including lift irrigation schemes. It does not take into account groundwater that is irrigation by dug wells and bore wells. The relevant data are given in Table 7.3.

Table 7.1. Irrigation Potential of River Basins in Maharashtra (1962)

Name of Basin	Culturable Area (Lakh Acres)	Water Resources		Culturable Command (Lakh Acres)	Irrigable by water in (4) (Lakh Acres)	Irrigable per MC ft** (Acres)	Irrigable as per cent of Culturable
		75% dependable (TMC*)	Of which utilisable (TMC*)				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Krishna (proper)	39.92	769.54	512.80	13.84	10.26	2.00	25.70
Bhima	97.39	309.40	308.42	26.07	18.62	6.03	19.12
Godavari (proper)	147.40	403.60	363.66	32.34	23.67	6.51	16.06
Wainganga (including Penganga & Wardha)	114.00	719.12	499.63	42.34	30.14	6.03	26.44
Tapi	82.83	228.86	206.07	16.35	12.93	6.27	15.61
West flowing rivers in Konkan	43.13	1,500.00	N.A.	N.A.	N.A.	-	-
Total	524.67	3,930.52					

(Source : Appendix F. Table No. 30. Report of Maharashtra State Irrigation Commission).
* TMC = Thousand Million Cubic Feet.
** MC ft = Million Cubic Feet.

Table 7.2. Use of Maharashtra Water Resources (1982)

(1)	Geographical Area in Maharashtra (Sq. Km) (2)	Permissible Utilisable Water (TMC) (3)	Water Use		Total (TMC) (6)
			Completed Schemes (TMC) (4)	Schemes Under Construction (TMC) (5)	
1. West flowing rivers	30,394	699	32.974 (4.74)	88.872 (12.77)	121.846 (17.51)
2. Tapi	51,254	242*	58.342 (24.11)	64.341 (26.59)	122.683 (50.70)
3. Narmada	1,659	11	..	..	..
4. Krishna	70,114	594	239.741 (40.36)	283.960 (47.80)	523.701 (88.16)
5. Godavari	154,341	1,089	177.619 (16.31)	446.357 (40.99)	623.976 (57.30)
Total		2,632	508.676 (19.33)	883.530 (33.57)	1,392.206 (52.90)

* Maharashtra's Master Plan for Tapi basin is for 242 TMC. Maharashtra's share out of 262 TMC will be decided after discussion with Madhya Pradesh.
Notes :   1.For west flowing livers and Tapi basin, the projectwise water use is taken from Master Plans.
2.   For Krishna Basin, the projectwise water use is taken from the water account prepared by Superintending Engineer, Irrigation Projects and Water Resources Investigation Circle, Pune.
3.   For Godavari basin below pochampad (Vidarbha area) Projectwise water use is taken from Chief Engineer, Irrigation Department, Nagpur's Report (December 1979) and for Godavari basin above Pochampad, the projectwise water use is taken from the available record in Mantralaya, and the water account submitted by Chief Engineer (Nashik) and Chief Engineer (Aurangabad).
4.   For minor irrigation schemes projectwise potential (Ha.) is available. Water use is taken as 2 hectares per MCft. for Konkan region and 5 hectares per MCft. for other regions.
5.   The information is inclusive of use on Hydro Projects in Krishna basin and water supply projects for Bombay Area.
6.   Figures in brackets are percentages in each case to utilisable water (Col. 3).

Table 7.3. Irrigation Potential Created, June 1960 and June 1982

District (1)	Net Sown Area, 1960-61 (2)	Irrigation Potential Created by June 1960 (000 hectares) (3)	Percentage of Col. (3) to Col. (2) (4)	Net Sown Area, 1978-79 (5)	Irrigation Potential Created by June 1982 (000 hectares) (6)	Percentage of Col. (6) to Col. (5) (7)
1. Greater Bombay	8.70	..	..	6.60	..	..
2. Thane	290.20	..	..	265.10	10.19	3.84
3. Raigad	215.10	1.80	0.84	195.80	27.86	14.68
4. Ratnagiri	357.50	..	..	356.30	12.07	3.39
Konkan (Excl. G. B.)	862.80	1.80	0.21	817.20	50.12	6.13
5. Nashik	906.50	35.16	3.88	889.60	125.26	14.08
6. Dhule	669.60	22.58	3.37	705.00	75.42	10.70
7. Jalgaon	805.90	14.41	1.79	810.50	115.47	14.25
8. Ahmednagar	1,258.60	59.63	4.74	1,214.90	214.49	17.65
9. Pune	985.20	70.07	7.11	1,001.00	148.63	14.85
10. Satara	680.30	25.55	3.75	585.90	103.83	17.72
11. Sangli	641.90	5.32	0.83	616.10	83.33	13.53
12. Solapur	1,206.00	66.13	5.48	1,137.40	174.04	15.30
13. Kolhapur	413.00	10.15	2.46	423.70	70.78	16.71
Western Maharashtra	7,567.00	309.00	4.08	7,384.10	1,111.25	15.05
14. Aurangabad	1254.10	1.05	0.08	1,214.00	121.57	10.01
15. Parbhani	913.30	..	..	1,007.30	143.86	14.28
16. Beed	748.80	7.03	0.94	809.50	78.09	9.65
17. Nanded	691.00	..	..	727.90	91.07	12.51
18. Osmanabad	1,037.30	3.56	0.34	1,115.00	72.56	6.51
Marathwada	4,644.50	11.64	0.25	4,873.70	507.15	10.41
19. Buldhana	680.30	..	..	681.90	37.13	5.45
20. Akola	763.90	..	..	820.70	48.83	5.95
21. Amravati	682.90	0.60	0.09	722.90	18.85	2.61
22. Yavatmal	736.00	0.32	0.04	854.60	43.70	5.11
23. Wardha	407.40	..	..	442.00	28.85	6.53
24 Nagpur	530.60	6.47	1.22	565.50	79.23	14.01
25. Bhandara	381.30	37.21	9.76	388.30	146.03	37.61
26. Chandrapur	612.60	19.16	3.13	690.80	86.25	12.49
Vidarbha	4,795.00	63.76	1.33	5,166.70	488.87	9.46
Maharashtra State	17,878.00	386.20	2.16	18,248.30	2,157.39	11.82
Maharashtra State (Excl. G.B.)	17,869.30	386.20	2.16	18,241.70	2,157.39	11.83

7.6. The irrigation potential in the State in June 1960 amounted to 386,200 hectares. By June 1982, this increased to 2,157,390 hectares which is 5.6 times as much as in 1960. In order to compare the development of irrigation in different regions and districts, one should relate the irrigation potential to the net cropped area. For this purpose, we have used the net sown areas in 1960-61 and 1978-79 (latest available district-wise), respectively. The irrigation potential in the State in June 1960 amounted to a mere 2.16 per cent of the net sown area in 1960-61. In June 1982,

it was 11.83 per cent of the net sown area in 1978-79. We may summarise the regional position as follows:

Region	Irrigation Potential as Percentage of Net Sown Area		
	June 1960	June 1982	June 1982 Increase 1960-82 Percentage points
1. Konkan	0.21	6.13	5.92
2. Western Maharashtra	5.06	15.05	9.99
3. Marathwada	0.25	10.41	10.16
4. Vidarbha	1.33	9.46	8.13
5. Maharashtra	2.16	11.83	9.67

Thus, the irrigation potential in June 1960 was very small and was very unevenly distributed between the regions. At the top was Western Maharashtra (4.08), followed by Vidarbha (1.33). At the bottom were Marathwada (0.25) and Konkan (0.21). But, between 1960 and 1982, the irrigation percentage in the State has increased from 2.16 to 11.83, which is 5.48 times and the increase is much more evenly distributed between the regions except Konkan. For instance, the increase in irrigation potential, in terms of percentage points, was nearly equal in Western Maharashtra (10.97) and Marathwada (10.16). The increase was somewhat smaller in Vidarbh (8.13) and really small in Konkan (5.92). But the increase was quite uneven as between the districts. In Konkan, the development of irrigation has taken place only in Raigad. In Vidarbha, it is largely in Bhandara, Chandrapur and Nagpur. In Marathwada, it is again largely in Parbhani and Nanded. In Western Maharashtra, it is spread more widely : in Nashik, Jalgaon and Ahmednagar in the North and in Satara, Sangli and Kolhapur in the South. Three districts are left far behind; they are Thane and Ratnagiri in Konkan and Amravati in Vidarbha.

Position as on 30th June 1982:

7.7. We may now examine the position as on 30th June 1982 in greater detail. We might assess the district backlog in irrigation on the basis of the irrigation potential as a percentage of the net sown area in each district. But this would not be quite appropriate because irrigation potential, as a measure of irrigation development, is not entirely satisfactory. Irrigation potential is defined as the gross area that can be irrigated in a year (1st July to 30th June) from a project on its full development on the basis of the projected cropping pattern and assumed water allowance for each crop. The gross irrigated area is the aggregate of the areas irrigated in different cropping seasons the areas under two seasonal and perennial crops counted only once. Because water requirements of different crops are different, irrigation potential in terms of a certain irrigable area is not a homogeneous quantity. Irrigation potential is normally distinguished into several categories of irrigation namely, kharif, rabi, hot-weather, two-seasonal (i.e., kharif + rabi) and perennial. For instance, the irrigation potential created by major, medium and State sector minor projects by June 1982 is broken up as under. (We do not have the relevant information for local sector minor irrigation projects, whose irrigation potential in June 1982 was 2,17,770 hectares out of a total potential of 2,157,390 hectares).

Seasonwise Irrigation Potential of Major, Medium and State Sector Minor Projects in June 1982

Season	Potential 000 hectares	Per cent to Total
1. Kharif	701.13	36.15
2. Rabi	790.47	40.75
3. Hot-weather	70.44	3.63
4. Two seasonal	228.84	11.80
5. Perennial	148.74	7.67
Total	1,939.62	100.00

Thus, 36.15 per cent of the irrigation potential is for kharif crops; 40.75 per cent for rabi crops; 3.63 per cent for hot weather crops; 11.80 per cent for two-seasonals; and 7.67 per cent for peren- nials. This distribution is not the same in all districts. In Table 7.4, we give the percentage distribution of irrigation potential in each district divided into the several categories.

Table 7.4. Percentage Distribution : Seasonwise Irrigation Potential Created State Sector Irrigation Projects as on June 30, 1982

District (1)	Kharif (2)	Rabi (3)	Hot Weather (4)	Two Seasonals (5)	Perennial (6)	Total 000 hectares (=100) (7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	11.92	59.36	16.69	6.67	5.36	8.39
3. Raigad	27.32	25.64	33.15	6.82	7.07	23.32
4. Ratnagiri	..	90.00	..	10.00	..	4.70
Konkan (excluding G.B.)	**20.24**	**41.72**	**25.07**	**7.20**	**5.77**	**36.41**
5. Nashik	42.39	48.39	0.79	4.58	3.85	113.36
6. Dhule	46.37	38.78	0.57	8.63	5.65	64.55
7. Jalgaon	38.43	34.10	1.63	20.05	5.79	106.31
8. Ahmednagar	32.68	46.21	2.03	12.71	6.37	206.56
9. Pune	22.37	56.50	2.12	11.65	7.36	133.86
10. Satara	34.79	36.86	10.58	3.84	13.93	97.63
11. Sangli	38.47	43.92	..	0.54	17.07	75.41
12. Solapur	18.53	53.29	19.13	2.60	6.45	142.61
13. Kolhapur	4.01	35.08	2.30	0.40	58.21	59.53
Western Maharashtra	**30.82**	**45.33**	**4.90**	**8.20**	**10.75**	**999.82**
14. Aurangabad	24.80	49.24	1.03	22.67	2.26	101.69
15. Parbhani	18.64	43.12	2.96	25.18	10.10	135.01
16. Beed	24.65	54.34	0.61	18.52	1.88	73.23
17. Nanded	37.38	39.84	2.68	11.99	8.11	87.56
18. Osmanabad	33.03	48.07	0.90	16.19	1.81	66.96
Marathwada	**26.55**	**46.32**	**1.82**	**19.80**	**5.51**	**464.45**
19. Buldhana	28.96	37.96	1.04	30.03	2.01	32.77
20. Akola	27.85	37.23	2.46	29.72	2.21	43.41
21. Amravati	30.03	48.42	1.68	19.66	0.21	14.25
22. Yavatmal	29.57	40.51	1.17	24.32	4.43	40.88
23. Wardha	25.16	44.79	1.27	26.28	2.50	27.62
24. Nagpur	59.27	27.93	1.97	6.09	4.74	68.11
25. Bhandara	82.41	11.30	..	2.71	3.58	132.56
26. Chandrapur	85.56	10.45	0.04	2.21	1.74	79.34
Vidarbha	**59.78**	**24.36**	**0.88**	**11.90**	**3.08**	**438.94**
Maharashtra State	**36.15**	**40.75**	**3.63**	**11.80**	**7.67**	**1,939.62**
Maharashtra State (excl. G.B.)	**36.15**	**40.75**	**3.63**	**11.80**	**7.67**	**1,939.62**

7.8. It will be noticed that the proportion of kharif potential is very high in Chandrapur (85.56), Bhandara (82.41), and .Nagpur (59.27). On the other hand, it is only 11.92 per cent in Thane, 4.01 per. cent in Kolhapur, and nil in Ratnagiri. In all other districts, it is mostly between 20 and 40 per cent. While kharif potential in Chandrapur and Bhandara is very high, the rabi potential in these districts is very low, 10.45 and 11.30 per cent respectively. In other, districts it varies between 30 and 60 per cent except in Ratnagiri where it is very high (90.0). Proportion of hot-weather potential is generally small and less than 3 per cent. But in some districts it is very

high. They are: Raigad (33.15), Thane (16.69), Solapur (19.13), and Satara (10.58). The proportion of two seasonal potential is generally high in Marathwada and Vidarbha except Chandrapur, Bhandara and Nagpur, It is also high in Jalgaon. Finally, the proportion of perennial potential is very high in Kolhapur (58.21), It is also relatively high in Sangli (17.07), Satara (13.93) and Parbhani (10.10).

Standard Rabi Equivalent:

7.9. Thus the seasonal distribution of irrigation potential in different districts is quite different. This is relevant because the water requirements of crops grown in different seasons are different. Hence, to compare the development of irrigation in different districts and to assess the backlog of the districts lagging behind, it is necessary to convert the irrigation potential in different seasons to some standard crop areas. The Maharashtra State Irrigation Commission (1962) had mentioned this in the context of non-utilisation of irrigation potential. We quote: "Non-utilisation of the irrigation potential is often assessed by merely comparing the area actually irrigated in a given year with that put down in the project. Such a comparison is not valid unless both the figures of acreages are converted to 'standard crop acres' (para 6.2.1, p. 152). The Government of Maharashtra had recognised the need for such conversion in another context. By a Circular Memorandum (No. CME 9065/96304 / St. Br.) dated March 28, 1967, the Government had directed that (a) the equivalent area (in terms of *rabi-bhusar,* such as traditional rabi jowar requiring three waterings) should be derived by multiplying the area under various crops by the factors as given in the following: Heavy Perennial crops (9), Light Perennials (6), Two seasonals, like Chilly, Turmeric, etc. (3), Paddy (3), E. L. S. Cotton (3), Vegetables, Onions (2), Seasonals (1), Hybrid maize, Bajra and Jowar-seed or commercial (3); and that (b) project reports in future should indicate also the cost per acre of equivalent standard area. We understand that this was not followed up and that, therefore, irrigation potential of each project is not available expressed in terms of equivalent *rabi-bhusar* area.

7.10. The estimates of irrigation potential available to us are in terms of seasons such as kharif, rabi, hot-weather, two seasonals,' and perennials and not in terms of the crops mentioned in the above mentioned circular Memorandum. We could not, therefore, convert the irrigation potential to standard rabi bhusar area by making use of the conversion factors given in the Circular Memorandum. Hence, we consulted the Irrigation Department how we might convert the irrigation potential given in terms of kharif, rabi, hot-weather, two seasonals, and perennials into standard rabi area. Recognising that the conversion factors would be somewhat different in different regions, the Department has advised us to use the following factors for converting the irrigation potential in different seasons into " Standard Rabi Area ", which is understood to mean a rabi crop requiring three waterings:

Region (1)	Kharif (2)	Rabi- (3)	Two Seasonal (4)	Perennial (5)	Hot Weather (6)
Konkan	0	1.67	3	6	3
Western Maharashtra	1	1.5	3	9 (except Kolhapur & Satara, where it is 6)	3
Marathwada	1	1.3	3	9	3
Vidarbha-I (Nagpur, Bhandara, Chandrapur)	1	1.5	3	6	3
Vidarbha-II (Rest of Vidarbha)	1	1.5	3	9	3

While suggesting these conversion factors, the Irrigation Department has cautioned us that these are "in the nature of broad indicative multipliers with some element of inexactitude, and they do not therefore represent the final considered views of the Department in this regard". In the circumstance, while we shall use the above factors for converting the irrigation potential in different seasons into "Standard Rabi Area", we wish to emphasise the need to review these conversion factors or otherwise suggest methods, so that a comparison of irrigation development in different districts or regions, as also a discussion of under-utilisation of irrigation potential, is placed on a firmer footing. We should also mention that though the above conversion factors are admittedly tentative and provisional, we prefer to use them because a comparison of irrigation development in different districts based on irrigation potential. so converted to standard rabi area will be more appropriate and closer to reality than one based on non-standardised irrigation potential.

Backlog in Irrigation:

7.11. In Col. 2 of Table 7.5, we give the Standard Rabi Equivalent of the irrigation potential of the State sector irrigation projects as on 30th June 1982. It will be noticed that the 1,939.62 lakh hectares of gross irrigation potential when converted to Standard Rabi Equivalent amounts to 3,896.51 lakh hectares, the ratio between the two being 2.01; that is to say, the Standard Rabi Equivalent of the irrigation potential is 2.01 times the gross or unstandardised irrigation potential. This ratio is different in different districts. It is the highest in Kolhapur being 4.14; this is because, 58.21 per cent of the irrigation potential in Kolhapur district (compared to 7.67 per cent in the State) is under perennial crops. If we leave aside this rather exceptional case, the ratio between the Standard Rabi Equivalent of irrigation potential and the

gross unstandardised irrigation potential varies from 2.60 in Sangli and 2.50 in Parbhani to 1.29 in Bhandara and 1.18 in Chandrapur. The very low ratios in Bhandara and Chandrapur are because 82.41 per cent of the irrigation potential in Bhandara and 85.56 per cent in Chandrapur is under kharif paddy.

7.12. It will be noted that the Standard Rabi Equivalent shown in Col. 2 of Table 7.5 relates to only the irrigation potential of the State Sector irrigation projects. It does not include the irrigation potential of the Local Sector projects; as already mentioned, we could not get its categorywise break-up. We understand that the Local Sector irrigation projects provide. mostly seasonal irrigation and we have been advised for that reason to take the conversion factor for this potential to be one. ip Col. 3 of the table we show the irrigation, potential of the Local Sector project and because its conversion factor is one, it also is own Standard Rabi Equivalent. Hence, the total of Clos. 2 and 3, shown in Col. 4, gives the total irrigation potential expressed in Standard Rabi Equivalent. In Col. 5 we show the Net Sown Area in 1978-79. In Col. 6 is shown the irrigation potential in Standard Rabi Equivalent as a percentage of the net sown area. It will be seen that in the State as a whole the percentage is 22.75, and that it varies from a high of 60.82 per cent in Kolhapur and 47.50 per cent in Bhandara to a low of 7.05 per cent in Thane and 3.97 per cent in Amravati. We suggest that we should use this percentage as an indicator of the irrigation development in different districts and assess the backing in the lagging districts on that basis. This is shown in Col. 7 of the Table. The backlog is shown in terms of irrigation potential expressed in Standard Rabi Equivalent. For the State as a whole the backlog amounts to 924,290 hectares of which 527,310, hectares are in Vidarbha, 260,670 hectares in Marathwada, 105,580 hectares in Konkan and only 30,730 hectares are in Western Maharashtra (mainly in Dhule district).

Table 7.5. Backlog at District Level in Standard Rabi Equivalent Hectares as on June 30, 1982

(Area : in thousand hectares)

District (1)	Standard Rabi Equivalent of Potential of State Sector Irrigation Projects (2)	Local Sector Irrigation Potential (3)	Col. (2) + Col. (3) (4)	Net Sown Area 1978-79 (5)	Col. (4) as Percentage of Col. (5) (6)	Backlog In Std. Rabi, Equivalent (7)
1. Greater Bombay	..	..	..	6.60	..	..
2. Thane	16.90	1.80	18.70	265.10	7.05	41.08
3. Raigad	47.85	4.54	52.39	195.80	26.76	..
4. Ratnagiri	8.47	7.37	15.84	356.30	4.45	64.50
Konkan (excluding G. B.)	**73.22**	**13.71**	**86.93**	**817.20**	**10.64**	**105.58**
5. Nashik	187.93	13.90	199.83	889.60	22.46	0.77
6. Dhule	118.15	10.87	129.02	705.00	18.30	29.96
7. Jalgaon	219.74	9.16	228.90	810.50	28.24	..
8. Ahmednagar	420.48	7.93	428.41	1,214.90	35.26	..
9. Pune	287.34	14.77	302.11	1,001.00	30.18	..
10. Satara	211.74	6.20	217.94	585.90	37.20	..
11. Sangli	195.75	7.92	203.67	616.10	33.06	..
12. Solapur	316.17	31.43	347.60	1,137.40	30.56	..
13. Kolhapur	246.44	11.25	257.69	423.70	60.82	..
Western Maharashtra	**2,203.74**	**111.43**	**2,315.17**	**7,384.10**	**31.35**	**30.73**
14. Aurangabad	183.31	19.88	203.19	1,214.00	16.74	70.57
15. Parbhani	337.57	8.85	346.42	1,007.30	34.39	..
16. Beed	124.23	4.86	129.09	809.50	15.95	53.45
17. Nanded	180.52	3.51	184.03	727.90	25.28	..
19. Osmanabad	109.18	5.60	114.78	1,115.00	10.29	136.65
Marathwada	**934.81**	**42.70**	**977.51**	**4,873.70**	**20.06**	**260.67**
19. Buldhana	64.93	4.36	68.99	681.90	10.12	84.78
20. Akola	87.30	5.42	92.72	820.70	11.30	92.35
21. Amravati	24.08	4.60	28.68	722.90	3.97	134.33
22. Yavatmal	84.48	2.82	87.30	854.60	10.22	105.41
23. Wardha	54.55	1.23	55.78	442.00	12.62	43.89
24. Nagpur	104.75	11.12	115.87	565.50	20.49	11.65
25. Bhandara	170.98	13.47	184.45	388.30	47.50	..
26. Chandrapur	93.97	6.91	100.88	690.80	14.60	54.90
Vidarbha	**684.74**	**49.93**	**734.67**	**5,166.70**	**14.22**	**527.31**
Maharashtra State						
Maharashtra State (Excl. G.B.)	**3,896.51**	**217.77**	**4,114.28**	**18,241.70**	**22.55**	**924.29**

7.13. This is the backlog in irrigation as on 30th June 1982 as it emerges if we examine the position district-wise. As we have mentioned, we have examined the position districtwise because we have been asked to do so and also because readily available data would not permit us to go below the district" level and examine the disparities at the taluka level. At the same time, we have emphasised that, for many purposes, it will be necessary to carry our analysis further down to the taluka level. Irrigation development is one such subject where the analysis will have to be carried to the taluka level. This is because irrigation in Maharashtra, particularly in districts where it is relatively developed, has remained highly concentrated in local pockets. This has created intra-district disparities as large as those between districts or between regions. Moreover, many of the areas which are lagging behind in irrigation are also among the drought-prone areas

in the State. It is imperative that we take into account at least these areas while assessing the backlog in irrigation development in the State.

Drought-Prone Areas:

7.14. Fortunately, relevant data are available taluka-wise for the drought-prone area in the State. This was compiled in September-October 1981 as directed by Irrigation Department's Circular Memorandum No. D. P. A. 1081/(229) K. G. dated 22-9-1981. The data as then compiled gave the taluka-wise position as on 30-6-1980. However, because the districtwise data presented so far gave the districtwise position as on 30-6-1982, we got the taluka-wise data of the drought-prone talukas updated to give the position as on 30-6-1982. We propose to make use of this data.

7.15. We should note that the irrigation potential in the districts as we have estimated earlier and the irrigation potential in the drought-pone talukas given in the abovementioned data are not quite comparable. It will be remembered that we got the districtwise irrigation potential broken up into kharif, rabi, hot weather, two-seasonal and perennial which we converted into Standard Rabi Equivalent by making use of certain conversion factors. On the other hand, the irrigation potential in the drought-prone talukas is estimated in the following manner: First the utilisable water from each project is assigned to different talukas under its command in proportion to the Irrigation Command Area of the project falling in different talukas. Second the quantum of water from all projects so assigned to a taluka is converted to irrigation potential at the rate of 10 acres per MCft. Ten acres per MCft. gives approximately 27.5 inches of utilisable water from the storage which taking the efficiency of water use at about 40 per cent, leaves about 11 inches of water at the field level. This is the

requirement possibly with some excess of three waterings in rabi which is also the basis of Standard Rabi area to which we converted the irrigation potential by making use of certain conversion factors. Hence the estimates of irrigation potential derived on, the basis of 10 acres per MCft. of water would be approximately comparable with the estimates of irrigation potential in terms of. Standard Rabi Equivalent. Nevertheless, to keep the two distinct we shall refer to them as the Standard Rabi Equivalent and, the Converted Irrigation Potential respectively.

7.16. Fortunately, it is possible for us to see how close is the correspondence between the two. As it happens all the talukas of Ahmednagar and Solapur districts are drought-prone. We have therefore two estimates of irrigation potential of the State Sector project in these districts: One in terms of the Standard Rabi Equivalent and the other in terms of the Converted Irrigation Potential. The two estimates are as under:

Irrigation Potential of State Sector Projects

District	Standard Rabi Equivalent (hectares)	Converted Irrigation Potential (hectares)
Ahmednagar	420,480	323,211
Solapur	316,170	246,352

It will be noticed that in both cases the Standard Rabi Equivalent is higher than the Converted Irrigation Potential; in Ahmednagar by 30.1 per cent, and in Solapur by 28.3 per cent.

7.17. In other districts, all talukas are not drought-prone. Hence, a similar check is not possible. But, in Nashik district, the difference between the two is evidently not as large as in Ahmednagar and Solapur. Out of 13 talukas in the Nashik district, all except two, Surgana and Peint, are drought-prone In the following are the details of the irrigation potential in the drought-prone talukas (in terms of Converted Irrigation Potential) and the whole district (in terms of Standard Rabi Equivalent).

Irrigation Potential of State Sector Projects in Nashik District

		(hectares)
	Net Sown Area	Irrigation Potential
Drought-Prone Talukas	821,800	155,653
Whole District	889,600	187,930

Thus, even if we neglect the irrigation potential in the non-drought prone talukas of the district, the irrigation potential in terms of Standard Rabi Equivalent is only 20.7 per cent higher than the same in terms of Converted Irrigation Potential.

7.18. Nevertheless, it seems that the estimates of irrigation potential of the drought-prone talukas in terms of Converted Irrigation Potential (10 acres par MCft. of water) are somewhat underestimates compared to the estimates in terms of the Standard Rabi Equivalent. This may overestimate the irrigation backlog of the drought-prone talukas. We shall correct this in the following manner: We shall first take the estimates of converted irrigation potential in the drought-prone talukas as they are given. These relate to only the State Sector projects. Hence, we shall add an estimated irrigation potential of the Local sector projects. We shall then relate this total potential to the net sown area of the taluka and determine the talukas which prima facie have an irrigation backlog; that is to say, the talukas in which the irrigation potential as percentage of the net sown area is lower than the State average (22.55). Then, to allow for the possibility that the Converted Irrigation Potential may be an underestimate of the irrigation potential of the State sector projects in these talukas, we shall raise it by 30 per cent and add to it the estimated potential of the Local Sector Projects. The estimate of irrigation potential so corrected will be the basis of our estimates of backlog in these talukas. The relevant details are shown in Table 7.6.

7.19. Table 7.6 covers only the drought-prone talukas. They are in 12 districts. All data are given talukawise. In Col. 2 is given the net sown area. In Col. 3 is given the Irrigation Potential of the State Sector projects, as on June 1982, estimated in terms of the Converted Irrigation Potential (10

acres per MCft.). In Col. 4 is shown the irrigation potential of the Local Sector projects. This information was not readily available talukawise. Hence, we have allocated the Local Sector irrigation potential in the district (Col. 3 of Table 7.5) to different drought-Prone talukas on the basis of its ratio to the State Sector potential in the district (Col. 2 of Table 7.5). In Col. 5, the total irrigation potential being the total of Cols. 3 and 4, is shown as percentage of the net sown area. *Prima facie*, the talukas where this percentage is below the State average (22.55) have backlog in irrigation. But then we correct the estimated irrigation potential in these talukas. We increase by 30 per cent the converted irrigation potential of the State Sector projects as shown in Col. 3 and than add to it the estimated potential of the Local Sector shown in Col. 4. The estimate of irrigation potential in the taluka so corrected is shown in Col. 6. We take this as the basis of assessing irrigation backlog in the drought-prone talukas. In Col. 7, the corrected irrigation potential is expressed as percentage of the net sown area. Talukas in which this percentage is below the State average (22.55) are considered to have a backlog. The backlog is shown in Col. 8. For all the drought-prone talukas with a backlog, it adds up to 730,750 hectares. This may be compared with the aggregate backlog of 924,290 hectares when we assessed it at the district level (Col. 7 of Table 7.5).

7.20. I will be noticed that in Table 7.6, for each district, we have added two lines: In one line, we summarise the information for the drought-prone talukas with a backlog as finally judged in Col. 8 the Table. It gives the aggregate backlog of these talukas assessed at the taluka level. In the second line, we give the information for the rest of the district. The irrigation potential in this residual part of the district is obtained by subtracting from the total potential-of the district, the potential of the drought-prone talukas with a backlog shown in the first line (Col. 6). To judge whether this part of the district has a backlog, we treat it as a unit because we do not have talukawise information for all its talukas.

Table 7.6. Irrigation Backlog in Drought Prone Talukas

(Area : in hectares)

District Taluka (1)	Net Sown Area, 1978-79 (2)	Irrigation Potential as in June 1982 (3)	Local Sector Irrigation Potential by June 1982 (4)	Col. (3) + (4) as Percentage of Col. (2) (5)	Corrected Irrigation Potential (6)	Col. (6) as Percentage of Col. (2) (7)	Backlog (8)
Nashik							
Malegaon	102,000	24,080	1,525	25.10	..	..	..
Baglan	87,200	16,707	1,058	20.37	22,777	26.12	..
Kalwan	62,200	7,866	498	13.45	10,724	17.24	3,302
Nandgaon	63,300	4,178	265	7.02	5,696	9.00	8,578
Nashik	64,900	19,506	1,235	31.96	..	..	..
Dindori	81,600	10,898	690	14.20	14,857	18.21	3,544
Igatpuri	55,100	219	14	0.42	299	0.54	12,126
Niphad	83,300	44,113	2,793	56.31	..	..	..
Sinnar	80,800	5,994	380	7.89	8,172	10.11	10,048
Yeola	75,200	18,881	1,196	26.70	..	..	..
Chandor	66,200	3,211	203	5.16	4,377	6.61	10,551
Backlog Talukas	409,200	32,366	2,050	8.41	44,125	10.78	48,149
Rest of District	480,400	155,564	9,850	34.43	155,705	32.41	..
Dhule							
Dhule	123,300	12,792	1,177	11.33	17,807	14.44	9,997
Sakri	129,700	9,121	839	7.68	12,696	9.79	16,551
Sindkheda	100,100	7,761	714	8.47	10,803	10.79	11,770
Nandurbar	82,200	10,506	967	13.96	14,624	17.79	3,912
Backlog Talukas	435,300	40,180	3,697	10.08	55,930	12.85	42,230
Rest of District	269,700	77,970	7,173	31.57	73,090	27.10	..
Jalgaon							
Edlabad	37,500	3,646	152	10.13	4,892	13.04	3,564
Amalner	77,200	7,159	298	9.66	9,605	12.44	7,804
Erandol	76,100	9,359	390	12.81	12,557	16.50	4,604
Parola	55,000	4,639	193	8.79	6,224	11.32	6,179
Chalisgaon	86,000	12,122	505	14.68	16,264	18.91	3,129
Pachora	63,000	7,106	296	11.74	9,534	15.13	6,525
Bhadgaon	33,600	5,727	239	17.75	7,681	22.86	..
Backlog Talukas	394,800	44,031	1,834	11.62	59,076	14.96	31,805
Rest of District	415,700	175,709	7,326	44.03	169,824	40.85	..
Ahmednagar							
Ahmednagar	104,000	3,546	67	3.47	4,677	4.50	18,775
Parner	129,600	22,701	428	17.85	29,939	23.10	..
Shrigonda	117,100	25,136	474	21.87	33,151	28.31	..
Karjat	102,600	15,995	302	15.88	21,096	20.56	2,040
Jamkhed	73,000	3,660	69	5.11	4,827	6.61	11,635
Shevgaon	80	29,641	559	37.75	..	..	..
Pathardi	92,800	2,038	38	2.24	2,687	2.90	18,239
Nevasa	107,800	64,087	1,209	60.57	..	..	..
Rahuri	66,000	35,345	667	54.56	..	..	..
Sangamner	100,800	9,982	188	10.09	13,165	13.06	9,565
Akola	93,800	4,488	85	4.88	5,919	6.31	15,233
Kopargaon	75,700	56,159	1,059	75.59	..	..	..
Shrirampur	71,700	50,433	951	71.67	..	..	..
Backlog Talukas	567,000	39,709	749	7.14	52,371	9.24	75,487
Rest of District	647,900	380,771	7,181	59.88	376,039	58.04	..

(Contd.)

Table 7.6. (Contd.)

District Taluka (1)	Net Sown Area, 1978-79 (2)	Irrigation Potential as in June 1982 (3)	Local Sector Irrigation Potential by June 1982 (4)	Col. (3) + (4) as Percentage of Col. (2) (5)	Corrected Irrigation Potential (6)	Col. (6) as Percentage of Col. (2) (7)	Backlog (8)
Pune							
Haveli	78,800	10,068	518	13.43	13,606	17.27	4,163
Junnar	97,900	10,483	539	11.26	14,167	14.47	7,909
Khed	64,700	1,124	58	1.83	1,519	2.35	13,071
Ambegaon	61,600	273	14	0.47	369	0.60	13,522
Sirur	128,200	16,102	828	13.21	21,761	16.97	7,148
Baramati	93,900	53,337	2,742	59.72	..	..	..
Indapur	115,300	26,771	1,376	24.41	..	..	..
Dhond	86,800	32,838	1,688	39.78	..	..	..
Purandhar	66,600	3,286	169	0.22	4,441	6.67	10,578
Backlog Talukas	497,800	41,336	2,216	8.73	55,863	11.22	56,391
Rest of District	503,200	246,004	12,644	51.40	246,247	48.94	..
Satara							
Koregaon	56,500	36,584	1,071	66.65	..	..	..
Khatav	91,300	10,174	298	11.47	13,524	14.81	7,064
Man	80,800	3,572	105	4.55	4,749	5.88	13,471
Phaltan	79,800	50,288	1,472	64.86	..	..	..
Khandala	31,000	3,717	109	12.34	4,941	15.94	2,050
Backlog Talukas	203,100	17,463	512	8.85	23,214	11.43	22,585
Rest of District	382,800	194,277	5,688	52.24	194,726	50.87	..
Sangli							
Miraj	74,900	16,578	671	23.03	..	..	..
Jath	134,900	4,682	189	3.61	6,276	4.65	24,144
Khanapur	106,900	5,439	220	5.29	7,291	6.82	16,815
Tasgaon	84,800	9,228	373	11.32	12,369	14.59	6,753
Atpadi	65,200	5,877	238	9.38	7,879	12.08	6,824
Kawathe Mahankal	43,600	3,327	135	7.94	4,460	10.23	5,372
Backlog Talukas	435,400	28,553	1,155	6.82	38,275	8.79	59,908
Rest of District	180,700	167,197	6,765	96.27	165,395	91.53	..
Solapur							
North Solapur	55,800	3,100	308	6.11	4,338	7.77	8,245
South Solapur	96,700	3,182	316	3.62	4,453	4.60	17,352
Barsi	143,100	10,005	995	7.69	14,001	9.78	18,268
Akkalkot	115,900	6,681	664	6.34	9,349	8.07	16,786
Mohol	110,100	10,667	1,060	10.65	14,927	13.56	9,901
Madha	125,300	9,982	992	8.76	13,968	11.15	14,287
Karmala	114,600	26,284	2,613	25.22	..	..	..
Pandharpur	95,000	80,785	8,031	93.49	..	..	..
Sangola	106,700	19,436	1,534	19.65	26,801	25.12	..
Malsiras	91,700	73,589	7,315	88.23	..	..	..
Mangalwedha	82,500	2,641	263	3.52	3,696	4.48	14,908
Backlog Talukas	729,400	46,258	6,132	7.18	91,533	12.55	99,747
Rest of District	408,000	269,912	25,298	72.35	249,935	61.25	..

(Contd.)

Table 7.6. *(Concld.)*

District Taluka (1)	Net Sown Area, 1978-79 (2)	Irrigation Potential as in June 1982 (3)	Local Sector Irrigation Potential by June 1982 (4)	Col. (3) + (4) as Percentage of Col. (2) (5)	Corrected Irrigation Potential (6)	Col. (6) as Percentage of Col. (2) (7)	Backlog (8)
Aurangabad							
Aurangabad	103,700	7,152	776	7.65	10,074	9.71	13,310
Paithan	102,900	12,240	1,327	13.18	17,239	16.75	5,965
Gangapur	111,500	4,715	511	4.69	6,641	5.95	18,502
Vaijapur	126,000	6,777	735	5.96	9,545	7.58	18,868
Kannad	97,600	6,693	726	7.60	9,427	9.66	12,582
Khuldabad	34,400	916	99	2.95	1,290	3.75	6,467
Ambad	188,500	46,790	5,074	27.51	..	..	..
Backlog Talukas	576,100	38,493	4,174	7.41	54,216	9.41	75,694
Rest of District	637,900	144,817	15,706	25.16	148,974	23.35	..
Beed							
Ashti	90,700	10,234	400	11.72	13,704	15.11	6,749
Beed	108,100	7,548	295	7.26	10,107	9.35	14,270
Patoda	93,800	6,552	256	7.26	8,773	9.35	12,379
Georai	120,100	2,984	117	2.58	3,996	3.33	23,086
Majalgaon	126,100	5,387	211	4.44	7,214	5.72	21,222
Kaij	134,900	2,802	110	2.16	3,752	2.78	26,668
Backlog Talukas	673,700	35,507	1,389	5.48	47,546	7.06	104,374
Rest of District	135,800	88,623	3,471	67.82	81,544	60.05	..
Osmanabad							
Osmanabad	99,500	6,202	318	6.55	8,381	8.42	14,056
Tuljapur	95,800	11,157	572	12.24	15,076	15.74	6,527
Paranda	94,500	8,581	440	9.55	11,595	12.27	9,715
Bhoom	57,900	3,125	160	5.67	4,223	7.29	8,833
Kalamb	108,500	1,138	58	1.10	1,537	1.42	22,930
Ahmadpur	116,100	4,733	243	4.28	6,396	5.51	19,785
Backlog Talukas	572,300	34,936	1,791	6.42	47,208	8.25	81,846
Rest of District	542,700	74,244	3,809	14.38	67,572	12.45	54,807
Buldhana							
Khamgaon	109,400	8,036	542	7.84	10,989	10.04	13,681
Malkapur	130,100	7,668	517	6.29	10,485	8.06	18,853
Backlog Talukas	239,500	15,704	1,059	7.00	21,474	8.97	32,534
Rest of District	442,400	48,926	4,541	12.09	47,697	10.78	52,246
Grand Total							
Backlog Districts	730,750	hectares.					
Rest of above Districts	107,053	hectares.					

7.21. Of the 12 districts appearing in the above Table, six districts have no backlog when it is assessed-at the district level as done in Table 7.5. These are: Jalgaon Ahmednagar, Pune, Satara, Sangli and Solapur. The irrigation potential in these districts at the district level is above the State Average. Obviously if -the drought-prone talukas with a backlog in these districts are taken out, the irrigation potential in the residual districts would be higher still.and they would have no backlog:

In the residual parts of these districts, the irrigation potential, as we have estimated it, is as shown in the following: Jalgaon (40.85 per cent); Ahmednagar (58.04 per cent); Pune (48.94 per cent); Satara (50.87 per cent); Sangli (91.53. per cent), and Solapur (61.25 per cent). The remaining six districts have a backlog when assessed at the district level as done in Table 7.5. But, in four of these districts, the irrigation potential in the residual parts have no backlog. The districts are:

Nashik (32.41 par cent); Dhule (27.10 per tent); Aurangabad (23.35 per cent); and Beed (60.05 per cent). Only in the other two districts, Osmanabad and Buldhana, the Irrigation potential in the residual parts excluding the drought- prone talukas with a backlog is below the State average; it is Osmanabad (12.45 per cent), and Buldhana (10.78 per cent). Their backlog is shown on the corresponding lines. It will be noticed that in these two districts, the backlog of the drought-prone talukas and the rest of the district add up to the backlog of the district as assessed in Table 7.5.

Revised Estimates of Backlog:

7.22. Because we have examined the irrigation potential in the drought-prone areas at the taluka level, the backlog in the 12 districts where these talukas are located, is now completely revised. As mentioned above, in 10 out of the 12 districts, only the drought-prone talukas have a backlog; the residual parts of the districts do not have any backlog. But the backlog of the drought-prone talukas in these districts is, much larger than the backlog of the districts assessed at the district level; in fact, six of the districts had no backlog when assessed at the district level. In Osmanabad and Buldhana, the drought-prone talukas and the residual parts of the districts both have a backlog. In the 13 districts with no drought-prone talukas, the backlog remains unrevised. In Table 7.7, we bring together, the revised estimates of the irrigation backlog of different districts.

7.23. Even at the cost of some repetition, we should note that, in so revising the estimates of the backlog, it is only in the drought-prone talukas that we have assessed it at the taluka level. In due course, it will be necessary and advisable to assess the backlog in all the talukas in the State also at the taluka level. But this need not and should not hold up the action for reducing the disparities in irrigation development as they appear in our estimates of the backlog. We suggest that, pending fully taluka wise assessment of the irrigation backlog, the estimates of districtwise backlog given in Col. 2 of Table 7.7 should be taken as the basis for devising a policy, both short term and long term, for reducing the prevailing glaring disparities in irrigation development. The irrigation, backlog in the aggregate amounts to 13,85,920 hectares-in Standard. Rabi Equivalent. Its cost, estimated at Rs. 10,000 per Rabi Equivalent hectare, amounts to Rs. 1,385:92 crore.

7.24. In devising a policy to reduce the existing disparities, account has to be taken of the fact that there are a large number of on-going projects under-construction which when completed may change the-relative positions of the districts considerably. This is of course true of all fields of development. In every field there would be some on-going development which, when completed, might change the present relative positions of the districts. This is a general problem and, in a later chapter, we shall examine its indications for a policy to reduce the existing disparities. In the present case, we need to examine the matter a little more specifically because, in the case of irrigation, the on-going projects in the aggregate are very large in relation to the present development. This happens because of two reasons: First, because the irrigation projects generally take a long time to complete, there is always a large number of projects under construction. Second, the level of present irrigation development in the State is rather low. As a result, there is almost as much additional potential in the projects-under construction as there is already developed. It will be remembered that the irrigation potential of the State as on 30-6-1982 was 2,157,390 hectares (Col. 6 of Table 7.3) or 4,114,280 hectares when converted to Standard Rabi Equivalent (Col. 4 of Table 7.5). The additional irrigation potential of the on-going projects is 1,830,670 hectares or

3,680,760 Standard Rabi Equivalent Hectares. These are all State Sector projects. Hence, conversion of their irrigation potential to Standard Rabi Equivalent is made on the basis of ratios between Col. 2 of Table 7.5 and Col. 7 of, Table 7.4, district by district. This is shows in Col. 3 of Table 7.7. In Col. 4 of the Table is shown the irrigation potential of the future projects converted to Standard Rabi Equivalent making use of the same ratios. As mentioned earlier, the estimates of' irrigation potential of the future projects are naturally tentative and subject to revision.

Table 7.7. Revised Estimates of Backlog

District	Irrigation Backlog in Std. Rabi Equivalent	Additional Irrigation Potential		Cost of Back-log@ Rs. 10,000 per hectare (Rs. in crore)
		From on-going Projects (thousand hectares)	From Future Projects	
(1)	(2)	(3)	(4)	(5)
1. Greater Bombay	..	..	..	..
2. Thane	41.08	127.41	134.11	41.08
3. Raigad	..	20.75	262.85	..
4. Ratnagiri	64.50	76.45	175.79	64.50
Konkan (Excl. G.B.)	**105.58**	**224.61**	**572.75**	**105.58**
5. Nashik	48.15	59.61	53.50	48.15
6. Dhule	42.23	43.02	51.19	42.23
7. Jalgaon	31.81	229.17	252.38	31.81
8. Ahmednagar	75.49	288.13	(-)31.48(?)	75.49
9. Pune	56.39	204.29	(-)38.80(?)	56.39
10. Satara	22.59	136.06	140.99	22.59
11. Sangli	59.91	299.37	0.39	59.91
12. Solapur	99.75	420.22	(-)74.30(?)	99.75
13. Kolhapur	..	331.70	466.58	..
Western Maharashtra	**436.32**	**1,941.57**	**896.22**	**436.32**
14. Aurangabad	75.69	63.27	195.62	75.69
15. Parbhani	..	236.00	140.35	..
16. Beed	104.37	43.21	193.86	104.37
17. Nanded	..	93.26	331.17	..
18. Osmanabad	136.65	32.40	111.92	136.65
Marathwada	**316.71**	**468.14**	**972.92**	**316.71**
19. Buldhana	84.78	(-)10.48(?)	141.16	84.78
20. Akola	92.35	2.25	78.69	92.35
21. Amravati	134.33	122.54	79.84	134.33
22. Yavatmal	105.41	290.34	311.48	105.41
23. Wardha	43.89	195.72	111.48	43.89
24. Nagpur	11.65	87.41	314.80	11.65
25. Bhandara	..	8.06	412.30	..
26. Chandrapur	54.90	350.60	196.74	54.90
Vidarbha	**527.31**	**1,046.44**	**1,667.46**	**527.31**
Maharashtra State	..	..	..	..
Maharashtra State (Excl. G.B.)	1,385.92	3,680.76	4,109.35	1,385.92

(?) : Needs Checking.*
* Editor's Note: This observation is from the Original Report.

7.25. Our interest is to see to what extent the present backlog as shown in Col. 2 of Table 7.7 may be removed by completing some of the on-going projects of which the additional potential is shown in Col. 3 of the Table. A straightforward comparison between Cols. 2 and 3 will not help because it must be remembered that, in the case of ten districts, though the backlog is shown as the backlog of the districts, it is in fact the aggregate of the backlog-of some of the drought-prone talukas in these districts. Hence, to judge how much of the backlog may be removed by completing some of the on-going projects, we need taluka wise break up of the irrigation potential of the on-going projects in at least these ten districts. Because of the different basis of the two sets of estimates, namely, in terms of Standard Rabi Equivalent and the Converted Irrigation Potential (10 acres per MCft. of water), and the difference we have noted between the two, we do not think it appropriate to make any detailed calculations on their basis. We recommend that talukawise estimates of the irrigation potential already created and the additional potential of the on-going projects on a uniform basis should be prepared at the earliest so that one may decide which of the on-going projects are relevant for the removal of the present backlog.

7.26. We understand that at present between 100,000 to 120,000 hectares of irrigation potential is added annually. On that basis, between July 1982 and June 1990, one may expect a net addition to irrigation potential of between 800,000 to 1,000,000 hectares, which in terms of Standard Rabi Equivalent would be between 1,600,000 to 2,000,000 hectares. Thus, removing the estimated backlog of about 1,400,000 hectares appears to be within the range of the Seventh Plan. We suggest that the irrigation programme in the Seventh Plan should be specifically directed to this purpose. This will mean that out of the presently on-going projects, those which are relevant to removal of backlog must receive priority in the Seventh Plan; the completion of the remaining projects will have to be postponed beyond the Seventh Plan. On the other hand, some new projects will have to be commenced and completed within the Seventh Plan period. In the choice of such projects, the districts and talukas where the present backlog cannot be removed by the on-going projects, must receive priority.

Under-utilisation of Irrigation Potential:

7.27. It has been represented to us that, while assessing irrigation backlog, we should take into account the extent of utilisation of the existing potential. The matter is undoubtedly important. We are aware that, there is much under-utilisation of irrigation potential in some regions or some districts, as indicated by the percentage of actual area irrigated to irrigation potential created. But, as emphasised long ago by the Maharashtra Irrigation Commission (1962), this is a very unsatisfactory measure of utilisation of irrigation potential. Recently, a High Power Committee appointed by the Government of Maharashtra (Irrigation Department, November 1981) to study the problems of under-utilisation of irrigation potential, has observed : "The irrigation potential available during a particular year for utilisation fluctuates from year to year depending upon the actual storage. Similarly, on a number of projects, the traditional crops envisaged in the project report are being replaced by high yielding and hybrid varieties of cereal crops. High yielding varieties need more water than the traditional varieties. Thus, although water is consumed, the area irrigated apparently appears to be lower than that envisaged in the project. Similarly, sometimes in the hot weather season, crops like summer rice, groundnut etc. not originally envisaged, are grown. As these crops need more water the area irrigated by them appears to be low. Hence,

we agree that in order to have meaningful comparison of utilisation, the actual gross irrigated area should be compared with the "effective potential" worked out on the basis of actual storage and also taking into consideration the different requirements of water for different crops, actually grown under irrigation rather than the projected potential. The gross areas both for potential and utilisation should be worked out on the same basis considering the type of crops, the water requirements and availability of storage during that particular year. If the figures of potential and utilisation as reported are not worked out on this basis, it will give a very distorted picture of actual position." (para 2.11). We understand that the matter is under further consideration of another committee of the Government. In the circumstance, we wish to emphasise that, while the problem of under-utilisation of irrigation potential is real and serious, and needs systematic and sustained attention, the evidence presently available is generally inconclusive and that therefore it must not be made an excuse for not removing the backlog in irrigation development where it exists.

Measure of Disparities in Irrigation Development:

7.28. As noted earlier, irrigation potential is defined as follows : "Irrigation potential is the gross area that can be irrigated from a project in a design year (1st July to 30th June of the succeeding year) for the projected cropping pattern and assumed water allowance on its full development. The gross irrigated area will be the aggregate of the areas irrigated in different cropping seasons, the areas under two seasonal, and perennial crops being counted only once in a year.' For reasons explained by the High Power Committee, this is a very unsatisfactory basis for judging utilisation of irrigation potential already created. We wish to emphasise that irrigation potential so defined is also a very unsatisfactory measure of irrigation development in different regions, districts, or talukas and therefore is a misleading basis for assessing regional disparities. Irrigation potentials, equal in terms of a certain gross irrigated area but with different cropping patterns, are not equivalent because water requirements of different crops are different. To take these into account means that irrigation potential of a project must be expressed not only in terms of a gross area with an assumed cropping pattern that can be irrigated by the project as designed but also in terms of the quantum of water that project is designed to make available for irrigation in different seasons. The conversion of the gross irrigation potential to Standard Rabi Evivalent is an approximation to this purpose. The converted irrigation potential (10 acres per MCft. of water) in terms of which the irrigation potential in the drought prone talukas is reported is in fact based on an indirect estimate of quantum of water designed to be made available to each taluka. It seems to us that it will be desirable to bring into the discussion of irrigation development the quantum of water designed to be made available to different regions/districts/talukas by different projects and assess the regional disparities on that basis.

7.29. We suggest that a beginning should be made by expressing irrigation potential of a project, besides in terms of a gross area designed to be irrigated by the project, in terms of the quantum of water that the project is designed to make available for irrigation. It will be desirable to give a break up of this quantum of water into three seasons : Kharif, Rabi and Summer. This is necessary because, the quantum of water designed to be made available for irrigation in the three periods have different connotations in terms of storage created by the project; water supplied during kharif is normally replenished by the monsoons and hence does not come out of the net

storage; water supplied during rabi come out of the storage and is net of the lake losses by evaporation during the period which is unavoidable and hence may be taken as normal; finally, water supplied in summer also comes out of the storage and is net of lake losses due to evaporation. But evaporation losses during summer awe large and are avoidable in the sense that there is the alternative of supplying more water during rabi rather than less water, because of evaporation losses, during summer. Hence, it seems to us that irrigation potential of a project will be better defined in terms of quantum of water designed to be made available at the canal head during (a) Kharif, (b) Summer, and (c) Summer, this duly corrected for extra evaporation losses. We understand that these are an essential part of the design data of a project and it seems to us more appropriate to compare the irrigation potentials created by different projects in terms of these parameters rather than gross area with an assumed cropping pattern that the projects are designed to irrigate.

7.30. For a more realistic appraisal of the irrigation development in different regions/districts/talukas it will also be necessary to make a correction for the inevitable difference between what was designed and what is in fact achieve. we presume that the quantum of water made available at the canal head of each project, during the three seasons, is routinely recorded. We should also consider the quantum of water if any that remained unutilised at the end of each year. We suggest that these four annual parameters for each project should be regularly published. Irrigation potential of a project should then be measured not in terms of what was designed but in terms of what was actually achieved over a period of years; we suggest an average over a period of ten years or a shorter period for which water accounting in the above manner is available.

7.31. We suppose that the above procedure will place the estimates of irrigation potential of a project on a firmer and realistic footing. For an assessment of irrigation development in different regions/districts/talukas, we need to know the regional break up of the irrigation potential of each project by districts/talukas it serves. The present practice of doing this on the basis of division of the Irrigable Command Area (ICA) of the project is of course not satisfactory. Again, what is needed is the quantum of water that the project in fact delivers, in the three seasons, to different districts/talukas averaged over a period of years. We understand that there is a provision of recording quantum of water delivered at the head of each distributory. If this record is regularly available for each project, that should constitute the basis for assessing the irrigation development indifferent districts/talukas. If the record is not available, because the practice has fallen into disuse, we recommend that immediate steps should be taken to establish this record.

7.32. Judged by the quantum of development expenditure involved and the impact it has on the total process of economic development in a region, irrigation is a major element in the regional disparities in development in Maharashtra. Rightly, it is also so recognised in the popular perception of the phenomenon. Hence, while the process of reducing the disparities in irrigation development must immediately begin on the basis of indicators we have used and the backlog we have assessed, steps must simultaneously be taken to improve the measures of irrigation development in different regions/districts/talukas along the lines suggested above.

8.1. The electrification of villages and energisation of agricultural pumpsets are two major items of Rural Electrification Programme. According to the definition of the Central Electricity Authority, a village is considered 'electrified' if electricity is being used within its revenue area for any purpose whatsoever. As on 31-3-1961, in the entire State, only 853 villages were electrified and only 6,695 agricultural pumps were energised. In comparison, as on 31-3-1983, 30,865 villages are electrified and 7,90,645 agricultural pumps are energised. Clearly, in 1961, rural electrification was just beginning. We shall not, therefore, discuss the districtwise details as on 31-3-1961, but confine attention to the position as on 31-30-1983. We shall first consider the electrification of villages.

Electrification of Villages:

8.2. In Table 8.1, we give the number of tribal and non-tribal villages as per 1971 Population Census and the number of tribal and non-tribal villages which were electrified as on 31-3-1983. In Cols. 6 and 7 of the Table are shown the percentages of tribal and non-tribal villages electrified. It will be noticed that in the State as a whole, 91.22 per cent of the non-tribal villages but only 61.91 per cent of the tribal villages were electrified. We suggest that the district backlog in this subject should be assessed on the basis of number of additional villages which must be electrified in order to bring the percentage of electrified villages in both tribal and non-tribal villages to the State Average of 91.22 for the non-tribal villages. The relevant data are given in Table 8.1A. The cost of electrification of villages is worked out at the rate of Rs. 1.80 lakh per village, as estimated by the Maharashtra State Electricity Board. The total cost of the backlog amounts to Rs. 54.90 crore.

Energisation of Agricultural Pumpsets:

8.3. Turning to energisation of agricultural

pumpsets, as mentioned above, a total of 7,90,645 pumpsets were energised as on 31-3-1983. Their districtwise distribution is given in Col. 5 of Table 8.2. To judge the districtwise achievement, we considered the following alternatives: Relate the number of pumps energised to (i) number of irrigation wells, (ii) irrigation wells in use, and (iii) number of applications for energising received, i. e. the number of pumps energised plus the pending applications. The relevant data are given in Cols. 3, 4 and 7 of the Table. The data on wells relate to 1978-79 while the data on number of pumps energised and pending applications relate to 31-3-1983. The two do not match. In a number of districts, the number of pumps energised plus pending applications (Col. 7) exceeds the number of irrigation wells (Col. 3); in some cases, even the number of energised pumps (Col. 5) exceeds the number of wells (Col. 3), as for instance, in Kolhapur, Nanded and Amravati. Either the data on number of wells is not quite accurate or more likely a number of new wells have come up during 1979-83. We also thought of judging the achievement in relation to the applications received that is number of pumps energised plus the pending applications. This could be a reasonable measure of demand for energising. However, the number of applications may depend upon the speed with which connections are given. In the circumstance, we think it will be appropriate to judge the achievement and backlog by relating the number of energised pumps to the gross cropped area in the district. Relevant data are given in Table 8.2A.

8.4. It will be seen that the number of energised pumpsets per 1,000 hectares is 38.80 in the whole State (Col. 2). It will need additional 142,885 pumpsets to be energised in order to bring the lagging districts to the State average (Col. 3). The cost of this, at the rate of Rs. 13,000 per pumpset, as estimated by MSEB, works out to Rs. 185.75 crore (Col. 4) Compared to the 142,885 new connections needed to remove the backlog in lagging districts, there are 258,363 applications pending as on 31-3-1983. In a number of districts there is no backlog but there are a number of

pending applications. We suggest that in dealing with the applications, priority should be given to applications in districts where there is a backlog. After these are cleared, applications from districts having relatively smaller number of energised pumpsets per 1,000 hectares should receive priority.

Backlog in Rural Electrification:

8.5. In Table 8.3, we bring together, the cost of backlog in rural electrification, namely, in (i) Electrification of villages, and (ii) Energisation of pumpsets. It adds up to Rs. 240.65 crore; Rs. 54.90 crore in electrification of villages and Rs. 185.75 crore in energisation of pumpsets.

Table 8.1. Rural Electrification

District	Number of villages as per 1971 Census		Villages Electrified upto March 31, 1983		Col. (4) as Percentage of Col. (2)	Col. (5) as Percentage of Col. (3)
	Tribal	Non-Tribal	Tribal	Non-Tribal		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	1023	565	755	498	73.80	88.14
3. Raigad	43	1,656	42	1,327	97.67	80.13
4. Ratnagiri	..	1,514	..	1,229	..	81.18
Konkan (Excl. G. B.)	1,066	3,735	797	3,054	74.77	81.77
5. Nashik	775	853	585	873(?)	75.48	102.34
6. Dhule	865	514	580	515(?)	67.05	100.19
7. Jalgaon	39	1,384	39	1,399(?)	100.00	101.08
8. Ahmednagar	106	1,206	97	1,159	91.51	96.10
9. Pune	142	1,339	103	1,123	72.54	83.87
10. Satara	..	1,142	..	1,075	..	94.13
11. Sangli	..	539	..	526	..	97.59
12. Solapur	..	948	..	951(?)	..	100.32
13. Kolhapur	..	1,083	..	1,014	..	93.63
Western Maharashtra	1,927	9,008	1,404	8,635	72.86	95.86
14. Aurangabad	..	1,866	..	1,820	..	97.53
15. Parbhani	135	1,370	135	1,200	100.00	87.59
16. Beed	..	1,028	..	1,363(?)	..	132.59
17. Nanded	..	1,324	..	1,024	..	77.34
18. Osmanabad	..	1,387	..	1,380	..	99.50
Marathwada	135	6,975	135	6,787	100	97.30
19. Buldhana	..	1,232	..	1,066	..	86.53
20. Akola	..	1,489	..	1,249	..	83.88
21. Amravati	309	1,328	197	1,255	63.75	94.50
22. Yavatmal	436	1,211	360	1,140	82.57	94.14
23. Wardha	..	962	..	850	..	88.36
24. Nagpur	92	1,533	91	1,343	98.91	87.61
25. Bhandara	258	1,242	155	999	60.08	80.43
26. Chandrapur	1,820	1,020	602	746	33.08	73.14
Vidarbha	2,915	10,017	1,405	8,648	48.20	86.33
Maharashtra State	..	..	..	..	..	..
Maharashtra State (Excl. G.B.)	6,043	29,735	3,741	27,124	61.91	91.22

(?) Needs Checking.*
* Editor's Note: This observation is from the Original Report.

Table 8.1A. Number of Villages Requiring Rural Electrification to Arrive at State Average*

District (1)	Additional Villages Requiring Electrification			Cost (Rs. in Lakh) (5)
	Tribal (2)	Non-Tribal (3)	Total (4)	
1. Greater Bombay	..	..	..	..
2. Thane	178	17	195	351.00
3. Raigad	..	184	184	331.20
4. Ratnagiri	..	152	152	273.60
Konkan (Excl. G.B.)	**178**	**353**	**531**	**955.80**
5. Nashik	122	..	122	219.60
6. Dhule	209	..	209	376.20
7. Jalgaon	..	..	..	..
8. Ahmednagar	..	..	..	..
9. Pune	27	98	125	225.00
10. Satara	..	..	..	..
11. Sangli	..	..	..	..
12. Solapur	..	..	..	..
13. Kolhapur	..	..	..	..
Western Maharashtra	**358**	**98**	**456**	**820.80**
14. Aurangabad	..	..	..	..
15. Parbhani	..	50	50	90.00
16. Beed	..	..	..	..
17. Nanded	..	184	184	331.20
18. Osmanabad	..	..	..	..
Marathwada	**..**	**234**	**234**	**421.20**
19. Buldhana	..	58	58	104.40
20. Akola	..	109	109	196.20
21. Amravati	85	..	85	153.00
22. Yavatmal	38	..	38	68.40
23. Wardha	..	28	28	50.40
24. Nagpur	..	55	55	99.00
25. Bhandara	80	134	214	385.20
26. Chandrapur	1,058	184	1,242	2235.60
Vidarbha	**1,261**	**568**	**1,829**	**3,292.20**
Maharashtra State	..	..	..	..
Maharashtra State (Excl. G.B.)	**1,797**	**1,253**	**3,050**	**5,490.00**

* 91.22 per cent.

Table 8.2. Irrigation Wells and Agricultural Pumpsets Energised

District	Gross Cropped Area 1981-82 (000 hectares)	Number of		Agricultural Pumps Energised as on 31-3-1983	Pending Applications for Agricultural Pumps as on 31-3-83	Col. (5) + Col. (6)
		Irrigation Wells 1978-79	Irrigation Wells in use 1978-79			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	6.40	..	..	..	..	..
2. Thane	279.50	8,074	7,591	8,574	767	9,341
3. Raigad	227.30	5,252	4,750	3,969	342	4,311
4. Ratnagiri	389.70	14,177	10,857	6,679	983	7,662
Konkan (Excl. G.B.)	896.50	27,503	23,198	19,222	2,092	21,314
5. Nashik	955.30	77,876	74,184	89,541	23,781	113,322
6. Dhule	770.00	30,957	26,745	36,534	9,475	46,009
7. Jalgaon	979.70	57,668	49,676	61,175	16,820	77,995
8. Ahmednagar	1,334.40	93,419	84,125	72,784	41,693	114,477
9. Pune	1,141.00	64,952	60,272	41,704	9,487	51,191
10. Satara	745.50	43,876	40,171	25,717	6,580	32,297
11. Sangli	662.40	47,358	43,891	37,156	12,330	49,486
12. Solapur	1,213.50	59,772	55,913	36,173	31,857	68,030
13. Kolhapur	473.80	18,041	15,866	27,084	4,351	31,435
Western Maharashtra	8,275.60	493,919	450,843	427,868	156,374	584,242
14. Aurangabad	1,373.10	79,449	74,329	62,219	34,531	96,750
15. Parbhani	1,153.20	29,568	26.793	22,841	2,707	25,548
16. Beed	895.60	35,135	33,152	21,966	13,781	35,747
17. Nanded	776.30	12,276	12,024	20,724	2,535	23,259
18. Osmanabad	1,346.20	48,838	44,642	43,730	8,857	52,587
Marathwada	5,544.40	205,266	190,940	171,480	62,411	233,891
19. Buldhana	786.90	34,642	25,043	34,334	9,210	43,544
20. Akola	841.10	20,918	12,999	22,024	6,328	28,352
21. Amravati	776.80	34,598	28,457	45,408	8,362	53,770
22. Yavatmal	873.70	19,570	14.874	23,169	3,388	26,557
23. Wardha	460.50	28,109	16.084	20,877	3,073	23,950
24. Nagpur	619.70	57,861	31,174	32,356	4,800	37,156
25. Bhandara	538.40	16,033	11,749	8,870	1,301	10,171
26. Chandrapur	765.90	15,197	10.949	5,037	1,024	6,061
Vidarbha	5,663.00	226,928	151,329	192,075	37,486	229,561
Maharashtra State	20,385.90	953,616	816,310	790,645	258,413	1,049,058
Maharashtra State (Excl. G.B.)	20,379.50	953,616	816,310	790,645	258,413	1,049,058

Table 8.2-A. Backlog in Energising of Pumpsets

District	Number of Pumpsets Energised per 000 hectares	Additional Pumpsets to be Energised to bring to State Average	Cost @ Rs. 0.13 lakh per Pumpset energisation (Rs. Lakh)	Pending Applications for Agricultural Pumps Energisation as on 31-3-1983
(1)	(2)	(3)	(4)	(5)
1. Greater Bombay	..	..	..	..
2. Thane	30.68	2,265	294.45	767
3. Raigad	17.46	4,846	629.98	342
4. Ratnagiri	17.14	8,434	1,096.42	983
Konkan (Excl. G.B.)	21.44	15,545	2,020.85	2,092
5. Nashik	90.88	..	..	23,781
6. Dhule	47.45	..	..	9,475
7. Jalgaon	62.44	..	..	16,820
8. Ahmednagar	54.54	..	..	41,693
9. Pune	36.36	2,777	361.01	9,487
10. Satara	34.5	3,193	415.09	6,580
11. Sangli	56.09	..	..	12,330
12. Solapur	29.81	10,887	1,415.31	31,857
13. Kolhapur	61.86	..	..	4,351
Western Maharashtra	51.7	16,857	2,191.41	156,374
14. Aurangabad	45.31	..	..	34,531
15. Parbhani	19.81	21,880	2,844.40	2,707
16. Beed	24.53	12,765	1,659.45	13,781
17. Nanded	26.73	9,381	1,219.53	2,535
18. Osmanabad	32.48	8,476	1,101.88	8,857
Marathwada	30.93	52,502	6,825.26	62,411
19. Buldhana	43.63	..	..	9,210
20. Akola	26.18	10,594	1,377.22	6,328
21. Amravati	58.46	..	..	8,362
22. Yavatmal	26.52	10,713	1,392.69	3,388
23. Wardha	45.34	..	..	3,073
24. Nagpur	52.21	..	..	4,800
25. Bhandara	16.47	12,009	1,561.17	1,301
26. Chandrapur	6.58	24,665	3,206.45	1,024
Vidarbha	33.92	57,981	7,537.53	37,486
Maharashtra State	38.78	142,885	18,575.05	258,363
Maharashtra State (Excl. G.B.)	38.80	142,885	18,575.05	258,363

Table 8.3. Cost of Backlog in Rural Electrification

(Rs. in Lakh)

District (1)	Electrification of Villages (2)	Energisation of Pumpsets (3)	Total Cost Cols. (2) + (3) (4)
1. Greater Bombay	..	..	..
2. Thane	351.00	294.45	645.45
3. Raigad	331.20	629.98	961.18
4. Ratnagiri	273.60	1,096.42	1,370.02
Konkan (excluding G.B.)	**955.80**	**2,020.85**	**2,976.65**
5. Nashik	219.60	..	219.60
6. Dhule	376.20	..	376.20
7. Jalgaon	..	..	..
8. Ahmednagar	..	..	..
9. Pune	225.00	361.01	586.01
10. Satara	..	415.09	415.09
11. Sangli	..	..	..
12. Solapur	..	1,415.31	1,415.31
13. Kolhapur	..	..	..
Western Maharashtra	**820.80**	**2,191.41**	**3,012.21**
14. Aurangabad	..	..	..
15. Parbhani	90.00	2,844.40	2,934.40
16. Beed	..	1,659.45	1,659.45
17. Nanded	331.20	1,219.53	1,550.73
18. Osmanabad	..	1,101.88	1,101.88
Marathwada	**421.20**	**6,825.26**	**7,246.46**
19. Buldhana	104.40	..	104.40
20. Akola	196.20	1,377.22	1,573.42
21. Amravati	153.00	..	153.00
22. Yavatmal	68.40	1,392.69	1,461.09
23. Wardha	50.40	..	50.40
24. Nagpur	99.00	..	99.00
25. Bhandara	385.20	1,561.17	1,946.37
26. Chandrapur	2,235.60	3,206.45	5,442.05
Vidarbha	**3,292.20**	**7,537.53**	**10,829.73**
Maharashtra State	**..**	**..**	**..**
Maharashtra State (Excl. G.B.)	**5,490.00**	**18,575.05**	**24,065.05**

CHAPTER XIV
AGRICULTURE

14.1. Agriculture is the main source of livelihood of a majority of the population of Maharashtra like it is generally all over India. According to the 1981 Population Census, 64.97 per cent of the State's population lived in rural areas; excluding Greater Bombay, the proportion was 74.81 per cent. Excepting the three districts of Nagpur, Pune and Thane, where the rural population was between 43 and 55 per cent in all other districts the rural population constituted 69 per cent or more of the population. (See Table 4.4 where the proportion of urban population in different districts is show.) The bulk of the rural population derives its income from agriculture. Hence, differences in agricultural conditions and development constitute an important factor in the regional disparities in development in the State.

Land for Agriculture:

14.2. Of the rural population, cultivators and agricultural labourers, together called Agricultural Workers in the censuses, depend directly on agriculture, In relation to this population, fend for agriculture is not available to the same extent in all the districts. In Col. 2 of Table 14.1, we give the number of male agricultural workers in each district according to the 1981 Census. We prefer to use the figures of male workers only because the classification of women between workers and non-workers, particularly in cultivator and agricultural labour households, is not very reliable. In Col. 3 of the Table, we show the average Net Sown Area in the three years 1978-79 to 1980-81. In Col. 4 is shown the Net Sown Area per male' agriculture worker. In the State as a whole the average is 2.06 Hectares per male agricultural worker. It varies from 2.72 in Aurangabad and Beed and 2.71 in Solapur to 1.18 in Bhandara, 1.06 in Kolhapur, 0.99 in Raigad and 0.87 in Thane.

14.3. But agricultural land in different districts is not of uniform quality as reflected in the value of its produce. In Col. 5 of Table 14.1, we show the gross value of output of agriculture-average for the three years 1978-79 to 1980-81. In Col. 6, this is shown per hectare of sown area. In the State as a whole, the gross value of agricultural output per hectare is Rs. 1,828.38. It varies from Rs. 4,069.10 in Kolhapur Rs 3 308 60 in Raigad, Rs. 3,115.50 in Ratnagiri, and Rs. 3,027.47 in Jalgaon to Rs. 1,398.33 in Yavatmal Rs 1 367 78 in Beed, Rs. 1,333.57 in Solapur, and Rs. 1,278.69 in Akola.

14.4. Combining agricultural land per male agricultural worker and gross value of agricultural output per hectare gives the gross value of agricultural output per male agricultural worker. This is shown in Col 7 of Table 14.1. In the State as a whole, it is Rs. 3,761.81. It varies from Rs. 5,381.16 in Jalgaon, Rs. 4,757 66 in .Pune, and Rs. 4,507.96 in Satara to Rs. 2,736.03 in Bhandara, Rs. 2,715.32 in Chandrapur, and Rs. 2,294.81 in Thane.

14.5. We may note that Gross Value of Output of Agriculture is gross of costs of inputs and therefore is not the same as net income from agriculture. For this purpose, the per capita domestic product, that is value added, from agriculture and allied activities is more relevant. (see para 4.22)

Cropping Pattern:

14.6. Broadly speaking, agricultural development consists in producing greater valued output per hectare of land. In the context of Maharashtra, this means availability of irrigation and growing of commercial crops such as oilseeds, cotton and sugarcane. The two elements are combined in the cultivation of sugarcane so that cultivation of sugarcane has come to be regarded the hallmark

of agricultural development. Sugarcane has another advantage. As experience has shown, it is the most convenient crop, unlike oilseeds and cotton, to organise the processing industry in the co-operative sector, particularly in the form of agricultural producer co-operatives. It has thus proved a powerful vehicle to promote industrial entrepreneurship among the agriculturists.

14.7. In Col. 2 of Table 14.2, we give the

percentage of Gross Cropped Area (1978-79) irrigated from all sources. In the State as a whole, it is 11.89. In Bhandara, it is 28.78. If we leave this aside, the percentage of gross cropped area irrigated varies from 20.51 in Ahmednagar, 18.35 in Satara, 16.49.in Pune, 16.23 in Sangli, and 15 36 in Kolhapur to less than 5 per cent in Thane, Raigad, Ratnagiri, and Buldhana, Akola, Amravati, and Yavatmal.

Table 14.1. Net Sown Area and Gross Value of Output of Agriculture

District (1)	Number of Male Agricultural Workers (1981) (2)	Average of Net Sown Area for 1978-79 to 1980-81 ('000 hectares) (3)	Net Sown Area per Male Agricultural Worker Col. (3)/Col. (2) (hectares) (4)	Gross Value of Output of Agriculture Average for 1978-79 to 1980-81 (Rs. Lakh) (5)	Gross Value of Output per hectare. Col. (5)/Col. (3) (Rs.) (6)	Gross Value of Output per Male Worker Col. (5)/Col. (2) (Rs.) (7)
1. Greater Bombay	4,761	6.40	1.34	146	2,281.25	3,066.58
2. Thane	304,164	263.90	0.87	6,980	2,644.94	2,294.81
3. Raigad	196,768	195.40	0.99	6,465	3,308.60	3,285.60
4. Ratnagiri	249,123	356.70	1.43	11,113	3,115.50	4,460.85
Konkan (Excl. G.B.)	**750,055**	**816.00**	**1.09**	**24,558**	**3,009.56**	**3,274.16**
5. Nashik	469,810	905.00	1.93	17,725	1,958.56	3,772.80
6. Dhule	391,711	705.50	1.80	11,031	1,563.57	2,816.11
7. Jalgaon	458,749	815.40	1.78	24,686	3,027.47	5,381.16
8. Ahmednagar	492,265	1,224.30	2.49	21,784	1,779.30	4,425.26
9. Pune	412,030	1,003.50	2.44	19,603	1,953.46	4,757.66
10. Satara	296,542	574.10	1.94	13,368	2,328.51	4,507.96
11. Sangli	316,333	610.90	1.93	13,306	2,178.10	4,208.99
12. Solapur	416,080	1,127.50	2.71	15,036	1,333.57	3,613.73
13. Kolhapur	396,922	422.60	1.06	17,196	4,069.10	4,332.34
Western Maharashtra	**3,650,242**	**7,388.80**	**2.02**	**153,735**	**2,080.65**	**4,211.64**
14. Aurangabad	460,883	1,252.40	2.72	18,414	1,470.30	3,995.37
15. Parbhani	386,443	1,002.70	2.59	14,769	1,472.92	3,821.78
16. Beed	296,634	807.00	2.72	11,038	1,367.78	3,721.08
17. Nanded	342,136	737.80	2.16	10,896	1,476.82	3,184.70
18. Osmanabad	456,120	1,125.20	2.47	18,209	1,618.29	3,992.15
Marathwada	**1,942,216**	**4,925.10**	**2.54**	**73,326**	**1,488.82**	**3,775.38**
19. Buldhana	320,881	680.10	2.12	11,729	1,724.60	3,655.25
20. Akola	354,887	823.50	2.32	10,530	1,278.69	2,967.14
21. Amravati	352,957	721.70	2.04	12,114	1,678.54	3,432.15
22. Yavatmal	372,697	851.30	2.28	11,904	1,398.33	3,194.02
23. Wardha	172,449	435.50	2.53	7,391	1,697.13	4,285.90
24. Nagpur	242,626	557.40	2.30	9,103	1,633.12	3,751.87
25. Bhandara	323,717	381.40	1.18	8,857	2,322.23	2,736.03
26. Chandrapur	395,865	686.50	1.73	10,749	1,565.77	2,715.32
Vidarbha	**2,536,079**	**5,137.40**	**2.03**	**82,377**	**1,603.48**	**3,248.70**
Maharashtra State	8,883,353	18,273.70	2.06	334,142	1,828.54	3,761.44
Maharashtra State(Excl. G.B.)	8,878,592	18,267.30	2.06	333,996	1,828.38	3,761.81

Table 14.2. Percentage of Gross Cropped Area, 1978-79 : Under :

District (1)	Irrigation (2)	Foodgrains (3)	Oilseeds (4)	Cotton (5)	Sugarcane (6)
1. Greater Bombay	10.29	..	..	..	...
2. Thane	2.72	70.73	0.91	..	0.04
3. Raigad	4.03	83.21	0.91	..	..
4. Ratnagiri	4.65	61.62	3.65	..	0.08
Konkan (Excl. G.B.)	**3.88**	**69.84**	**2.10**	..	**0.05**
5. Nashik	14.89	75.67	9.19	0.33	2.52
6. Dhule	11.10	74.49	14.17	7.31	1.44
7. Jalgaon	13.00	63.27	9.92	19.89	0.88
8. Ahmednagar	20.51	77.75	7.35	1.44	4.61
9. Pune	16.49	73.03	6.16	0.97	1.98
10. Satara	18.35	72.92	11.14	1.26	2.97
11. Sangli	16.23	72.41	9.31	0.46	4.47
12. Solapur	13.20	86.87	7.82	1.13	1.69
13. Kolhapur	15.36	53.26	12.41	0.21	11.47
Western Maharashtra	**15.66**	**74.10**	**9.17**	**3.72**	**3.05**
14. Aurangabad	12.49	74.06	11.61	11.18	1.44
15. Parbhani	6.59	65.49	11.28	20.56	0.23
16. Beed	13.27	80.97	13.74	2.87	1.01
17. Nanded.	5.63	63.31	6.01	25.63	0.75
18. Osmanabad	13.62	76.75	14.7	2.64	1.6
Marathwada	**10.61**	**72.4**	**11.77**	**11.98**	**1.05**
19. Buldhana	4.16	59.26	10.61	28.32	0.23
20. Akola	2.65	53.67	6.01	39.35	0.07
21. Amravati	4.94	45.71	7.20	44.46	0.04
22. Yavatmal	2.86	50.45	6.05	42.16	0.23
23. Wardha	7.89	51.44	9.01	37.85	0.04
24. Nagpur	10.12	67.78	11.35	13.02	0.05
25. Bhandara	28.78	88.40	9.27	..	0.16
26. Chandrapur	17.57	81.35	10.66	5.45	0.01
Vidarbha	**8.68**	**56.93**	**8.54**	**27.93**	**0.11**
Maharashtra State	**11.89**	**69.77**	**9.39**	**12.57**	**1.57**
Maharashtra State (Excl. G.B.)	**11.84**	**69.77**	**9.39**	**12.57**	**1.57**

14.8. Due to the difference in soil and climatic conditions and development of irrigation, the different regions of the State have noticeably different crop patterns. Table 14.2 gives the percentage of the gross cropped area under, foodgrains (Col. 3), oilseeds (Col. 4), cotton (Col. 5), and sugarcane (Col. 6) in 1978-79. Maharashtra is a predominantly foodgrains growing State, with nearly 70 per cent of the gross cropped area under foodgrains. However, Vidarbha region is markedly different from the others: excluding the districts of Bhandara, Chandrapur and Nagpur, the remaining 5 districts have just about half the gross cropped area under foodgrains. As against this, all the other districts of the State show much heavier concentration of area under foodgrains: the districts of Ratnagiri, Jalgaon, Kolhapur, Parbhani and Nanded have between 60 to 65 per cent and all other districts have more than 70 per cent area under foodgrains.

14.9. Among foodgrains, cereals occupy about 55 per cent of the gross cropped area, and pulses about 15 per cent. The most important cereals are Rabi and Kharif jowar, occupying between them 31 per cent of the area, followed by bajra, rice and

wheat, in that order. The three districts of Konkan, and Bhandara and Chandrapur are predominantly paddy growing districts. The other six districts of Vidarbha are mainly kharif jowar area. The two districts of Nashik and Dhule are mainly bajra growing districts-they have more land under bajra than under Kharif and Rabi jowar combined. The districts of Pune, Ahmednagar and Solapur on the other hand are predominantly Rabi jowar growing areas, with bajra and Kharif jowar being of comparatively smaller importance. Kolhapur is mainly a paddy and Kharif jowar growing district, while the two districts of Sangli and Satara have three crops, Kharif and Rabi jowar and bajra of equal importance. The districts of Marathwada region are mainly jowar growing with Rabi jowar being comparatively important in Aurangabad (including Jalna), Beed and Parbhani and Kharif jowar in Nanded, Osmanabad (and Latur) districts. Wheat, a less important cereal in the State, is grown in al districts except the coastal district of Konkan; but it is relatively more significant in the districts of Nashik, Dhule and Jalgaon in Western Maharashtra, in Beed, Parbhani and Aurangabad in Marathwada and in Nagpur and Wardha districts of Vidarbha region. Pulses are grown in every district, but they are more important in Marathwada, Vidarbha and in the districts of Jalgaon and Dhule in Western. Maharashtra, and of less importance in the Konkan region. Thus, the development of agriculture in the different regions depends first of all upon the development of these cereal and pulse crops in the respective regions and districts.

14.10. Cotton occupies about 12 per cent of the gross cropped area. It is, however, concentrated in three regions: in the six districts of Vidarbha region (excluding Bhandara and Chandrapur), in Aurangabad, Parbhani and Nanded districts of Marathwada, and in Dhule and Jalgaon districts of Western Maharashtra. In the four districts of the Amravati division, it is very important, accounting for almost 40 per cent of the gross cropped area.

14.11. Groundnut is the most important oilseed in the State accounting for about 4 per cent of the gross cropped area. While it is grown in the most districts except the dominant rice-growing ones, it is particularly significant in the districts of Jalgaon, Dhule, Nashik, Satara, Sangli, and Kolhapur in Western Maharashtra and Osmanabad in Marathwada where it forms almost 10 per cent of the gross cropped area. In the other districts of Marathwada as well as in Vidarbha it constitutes about 3 to 4 per cent of the gross cropped area.

14.12. Sugarcane occupies hardly 1.57 per cent of the gross cropped area of the State, but in terms of total value of production is the single most important crop in the State. However, its production is concentrated in regions where perennial irrigation facilities are available. These are today in the districts of Western Maharashtra. More than 11 per cent of the Gross Cropped Area (G.C.A.) in Kolhapur, around 4.5 per cent in the districts of Ahmednagar and Sangli, between. 2.5 to 3 per cent in the districts of Satara and Nashik and between 1.5 to 2 per cent in the districts of Pune, Solapur and Dhule are under sugarcane.

Agricultural Growth:

14.13. The annual compound growth rate of total agricultural production (at constant prices) in the State has been a little over 1 per cent during two decades of the Sixties and Seventies. Crop-wise performance was of course uneven. During the 22 years, from 1960-61 to 1981-82, production of total foodgrains increased at an annual compound rate of 2.7 per cent. (Table 14.3). The growth in foodgraings has been particularly significant in the 5 years, 1977-78 to

Table 14.3. Districtwise Annual Compound Growth Rates of Production of
Total Foodgrains, Cotton, Sugarcane and Total Oilseeds
(Period 1960-61 to 1981-82 with triennium ending 1961-62 as base)

(per cent)

District (1)	Total Foodgrains (2)	Total. Oilseeds (3)	Cotton (4)	Sugarcane (5)
1. Greater Bombay	..	..	..	..
2. Thane	1.3	..	..	..
3. Raigad	1.7	..	..	..
4. Ratnagiri	2.8	..	..	..
5. Nashik	2.4	1.7	(-) 6.9	7.5
6. Dhule	7.9	(-) 1.0	(-) 1.0	13.1
7. Jalgaon	4.0	1.6	(-) 1.8	14.1
Bombay Dn.	2.6	0.6	(-) 1.8	9.3
8. Ahmednagar	1.9	7.2	(-) 6.2	3.3
9. Pune	3.4	6.1	0.7	5.6
10. Solapur	0.2	(-) 0.3	3.0	5.1
11. Satara	2.3	(-) 1.3	5.7	7.0
12. Sangli	0.7	(-) 3.6	(-) 2.9	7.9
13. Kolhapur	2.9	(-) 0.3		3.7
Pune Dn.	1.9	0.5	(-) 0.8	4.7
14. Aurangabad	2.4	6.2	0.0	6.0
15. Parbhani	3.0	5.9	1.8	4.4
16. Beed	2.7	(-) 1.2	(-) 4.2	8.4
17. Nanded	2.1	(-) 1.6	1.5	6.1
18. Osmanabad	3.4	(-) 1.1	(-) 2.7	8.2
Aurangabad Dn.	3.0	1.2	0.4	6.8
19. Buldhana	4.8	6.6	0.1	4.6
20. Akola	3.5	0.7	1.4	..
21. Amravati	4.2	3.6	(-) 0.3	..
22. Yavatmal	3.8	2.7	2.0	13.9
23. Wardha	3.7	5.4	3.4	..
24. Nagpur	3.0	2.4	1.3	..
25. Bhandara	2.1	(-) 1.5		5.2
26. Chandrapur	2.3	1.6	5.0	..
Nagpur Dn.	3.3	2.8	1.1	6.9
Total Maharashtra State	2.7	1.1	0.4	5.4

1981-82. The foodgrain crops which registered significant increases are kharif jowar, rice and wheat. Kharif jowar which is the dominant cereal crop in 6 of the Vidarbha districts, in parts of Marathwada region, and in Dhule, Jalgaon, and Nashik districts of Western Maharashtra, registered a somewhat higher growth rate in production during this period, mainly on account of increase in per acre yields. Rice, another important cereal, also registered significant growth rate in production, though not as much as for all foodgrains. Among the major paddy growing regions of Konkan and Bhandara and Chandrapur, the growth rate was higher in the latter two districts. The highest growth in production was recorded in case of wheat; this was more or less the case in all districts growing wheat, though the growth was higher in districts where there was wheat area under irrigation. In this case also the major source of increase in production was the increase in per acre yields.

14.14. As against these three foodgrains, production of Rabi jowar, bajra and pulses showed little or no significant growth over these 20 years. Rabi jowar is the main cereal in large part of the unirrigated area of Western Maharashtra and Western part of Marathwada region, and this showed no significant increase in production, since it is grown under unirrigated condition. Bajra and pulses also registered very small growth rates of production.

Table 14.4. Total Area under Kharif Jowar, Rabi Jowar, Bajra, Paddy, Wheat and Tur in 1982-83

(Area in Hectares)

District (1)	Normal Area (2)	Hybrid Area (3)	High Yielding Variety Area (4)	Percentage of Hybrid Area to Normal Area (5)	Percentage of High Yielding Variety Area to Normal Area (6)
1. Greater Bombay	1,700				
2. Thane	157,700	30	103,874	0.02	65.87
3. Raigad	143,100		106,318		74.30
4. Ratnagiri	149,500	322	83,414	0.22	55.80
Konkan (Excl. G. B.)	**450,300**	**352**	**293,606**	**0.08**	**65.20**
5. Nashik	676,000	161,837	190,135	23.94	28.13
6. Dhule	492,700	207,495	161,138	42.11	32.71
7. Jalgaon	601,500	285,827	255,675	47.52	42.51
8. Ahmednagar	1,074,100	80,241	112,226	7.47	10.45
9. Pune	767,500	22,349	119,084	2.91	15.52
10. Satara	446,400	54,073	105,976	12.11	23.74
11. Sangli	446,300	75,022	105,761	16.91	23.70
12. Solapur	963,700	25,094	153,781	2.60	15.96
13. Kolhapur	165,700	27,307	97,462	16.48	16.48
Western Maharashtra	**5,633,900**	**939,245**	**1,311,238**	**16.67**	**23.27**
14. Aurangabad	1,061,100	267,598	329,372	25.22	31.04
15. Parbhani	612,000	94,455	281,495	15.43	45.96
16. Beed	640,200	158,911	169,656	24.82	26.50
17. Nanded	482,800	119,894	208,321	24.83	43.15
18. Osmanabad	839,100	178,502	320,305	21.27	38.17
Marathwada	**3,635,200**	**819,360**	**1,309,949**	**22.54**	**36.04**
19. Buldhana	472,800	193,055	155,502	40.83	32.89
20. Akola	488,100	123,844	190,047	25.37	38.94
21. Amravati	330,600	120,079	111,549	36.32	33.74
22. Yavatmal	443,700	154,743	131,553	34.88	29.65
23. Wardha	237,900	80,092	95,710	33.67	40.23
24. Nagpur	385,400	69,569	136,125	18.05	35.32
25. Bhandara	361,000	245	188,617	0.07	52.25
26. Chandrapur	528,000	16,390	169,581	3.10	26.44
Vidarbha	**3,247,500**	**761,617**	**1,178,684**	**23.45**	**36.30**
Maharashtra State	**12,968,600**	**2,520,574**	**4,993,477**	**19.44**	**31.56**
Maharashtra State (Excl. G.B.)	**12,966,900**	**2,520,574**	**4,093,477**	**19.44**	**31.57**

14.15. The increase in production and productivity of foodgrains was due to extension of high yielding varieties and hybrid seeds of kharif jowar, wheat and rice. Table 14.4 shows the percentage of normal area under the cereal crops-kharif and rabi jowar, wheat, rice, bajra, and tur, which were put under HYV's or Hybrid seeds during the year 1982-83. Hybrids refer to jowar and bajra while HYV's refer to wheat, rice and tur. Taking the two together 51 per cent of the normal area under these crops in the State was covered by these improved varieties of seed by 1982-83. The coverage was higher than the State average in all the regions except Western Maharashtra. The districts that were below the State average were Ahmednagar, Pune, Satara, Sangli, Solapur, Kolhapur and Chandrapur. One important reason for the poor extension of Hybrid seeds in these districts of Western Maharashtra is that Rabi jowar is a very important cereal here, and its new hybrid seeds have not been successful under unirrigated condition. Hybrid bajra has also not caught on because of risk of certain types of pests, and some of these districts have significant

land under bajra. Chandrapur, a mainly paddy growing district, also shows rather poor use of HYV seeds.

14.16. The non-foodgrain crops, with the exception of sugarcane, however, have registered poor rates of increase in production during the last two decades. Cotton, the most important cash crop of the State in terms of area, registered negligible increse in production-hardly 0.4 per cent a year and oilseeds, the next important group

of cash crops, just about 1.1 per cent increase per year (Table 14.3). Sugarcane, on the other hand, which accounts for hardly 1.57 per cent of the total cropped area, registered 5.4 per cent annual increase in production. These cash crops are not equally important in every part of the State, but are specific to particular regions and districts. This disparity in the growth of cash crops is largely responsible for regional differences in agricultural development.

Table 14.5. Area under Hybrid and HYV Cotton, Groundnut, Sunflower in 1982-83

(Area in Hectares)

District	Normal Area	Hybrid Area	High Yielding Variety Area	Percentage of Hybrid Area to Normal Area	Percentage of High Yielding Variety Area to Normal Area
(1)	(2)	(3)	(4)	(5)	(6)
1. Greater Bombay	..	..	..	..	..
2. Thane	3,100	..	100	..	3.22
3. Raigad	..	..	100	..	..
4. Ratnagiri	3,500	..	2,000	..	57.14
Konkan (Excl. G.B.)	**6,600**	**.**	**2,200**	**.**	**33.33**
5. Nashik	88,400	433	61,567	0.49	69.65
6. Dhule	183,800	6,964	160,636	3.79	87.40
7. Jalgaon	248,200	15,068	250,732	6.07	101.02
8. Ahmednagar	26,500	389	23,611	1.47	89.10
9. Pune	51,600	2,419	35,781	4.69	69.34
10. Satara	69,400	1,782	70,718	2.57	101.90
11. Sangli	57,800	2,575	33,400	4.46	57.78
12. Solapur	64,100	1,781	60,119	2.78	93.79
13. Kolhapur	56,800	625	53,000	1.10	93.31
Western Maharashtra	**846,600**	**32,036**	**749,564**	**3.78**	**88.54**
14. Aurangabad	174,100	50,607	155,493	29.06	89.31
15. Parbhani	211,700	38,885	211,215	18.37	99.77
16. Beed	77,800	2,645	79,755	3.40	102.51
17. Nanded	234,000	46,467	185,633	19.86	79.33
18. Osmanabad	253,600	1,096	99,104	0.43	39.08
Marathwada	**951,200**	**139,700**	**731,200**	**14.69**	**76.87**
19. Buldhana	242,400	93,282	196,518	38.48	81.07
20. Akola	361,200	37,248	329,752	10.31	91.29
21. Amravati	375,100	31,078	356,322	8.29	94.99
22. Yavatmal	396,500	100,015	336,285	25.22	84.91
23. Wardha	188,400	69,465	116,835	36.87	62.01
24. Nagpur	118,000	22,016	81,284	18.66	68.88
25. Bhandara	3,200	..	1,100	..	34.37
26. Chandrapur	83,600	14,366	35,434	17.18	42.39
Vidarbha	**1,768,400**	**367,470**	**1,453,530**	**20.78**	**82.19**
Maharashtra State	**3,572,800**	**539,206**	**2,936,494**	**15.09**	**82.19**
Maharashtra State (Excl. G.B.)	**3,572,800**	**539,206**	**2,936,494**	**15.09**	**82.19**

14.17. Cotton is the important cash crop in all but Bhandara and Chandrapur districts of Vidarbha, in the districts of Marathwada region, as well as in the districts of Dhule and Jalgaon of Western Maharashtra. In the for western districts of Vidarbha, it accounts for nearly 40 per cent of the total area under crops; in Marathwada and the Khandesh districts for over 10 per cent of the crop area. Production of cotton in Jalgaon, Dhule, as also in Beed, Osmanabad and Amravati districts has registered a declining trend. In the districts of Parbhani, Nanded, Akola, Yavatmal, Wardha and Nagpur the rate of increase has been above the State average. The growth rate for Vidarbha region was 1.1 per cent a year, and in Marathwada as a whole it was negligible (0.4 per cent).

14.18. Similar is the situation in regard to oilseeds. The major groundnut growing districts of the State are as follows, for which the figures in brackets indicate the annual compound, rate of growth of all oilseeds: Dhule (-1.0), Jalgaon (1.6), Nashik (1.7), Satara (-1.3), Sangli (-3.6), Kolhapur (-0.3), Osmanabad (-1.1) Buldhana (6.6), Akola (0.7), Amravati (3.6), Yavatmal (2.7). The increase in production registered in some districts has been due to modest increases in per acre yield rates, particularly where irrigated summer groundnut has come up. But the decline in production in many of the districts has been mainly due to decline in area under groundnut.

14.19. Both cotton and groundnut are grown mainly under unirrigated condition in the State. In the major cotton and groundnut growing districts the crops are unirrigated. The area under hybrid of these two crops and sunflower, another new oilseed, as percentage of the normal area under these crops, was only about 15 per cent for the State as a whole (Table 14.5). It was above the State average only in the districts of Aurangabad, Nanded and Parbhani of Marathwada region and Buldhana, Yavatmal, Wardha, Nagpur and Chandrapur of Vidarbha region. But even among these districts the percentage of area under hybrid was higher than 30 only in 2 districts. Thus these two major cash crops of the State have shown-stagnancy or very low growth in production and productivity, and consequently it has affected the rate of agricultural development in the regions in which these crops are important, particularly Vidarbha and Marathwada.

14.20. As against these commercial crops, sugarcane, an exclusively irrigated crop, registered a 5.4 per cent annual compound growth rate in production. While in most districts growing this crop the growth rate was higher than the State average, the really significant districts are all in Western Maharashtra. Increase in area under sugarcane due to extension of surface and well irrigation has resulted in the crop becoming the most important single crop in the State, measured in terms of the gross value of total production. It has not merely given much higher income in the hands of a relatively small but growing body of cultivators in Western Maharashtra, but has helped establish many forward and backward linkages in production and services in the area. The use of fertilizer, insecticide, and mechanical equipments is naturally noticed more in irrigated areas, which are predominantly in Western Maharashtra.

14.21. Table 14.6 gives the use of fertiliser per hectare of gross sown area in each district of the State. Average use of fertiliser (N+P+K) per hectare of gross sown area (arrived at by dividing the average of the 3 years' use of fertilizers (N+P+K) during 1981-83 by the gross sown area in 1981-82) in the State as a whole (excluding Greater Bombay) was 24 kg. a hectare. But Marathwada region's average use (12 kg.) was way below the State average. Vidarbba's average was 21 kg, Western Maharashtra and Konkan were above the State average. The districts of Thane, Ratnagiri, Ahmednagar and Amravati were marginally below the State average, while Solapur, all the districts of Marathwada, Akola. Yavatmal, Bhandara and Chandrapur were way

below the State average. Most Western Maharashtra districts were above the State average, the highest consumption of fertilizer being in Kolhapur, 128 kg. per hectare, followed by Jalgaon, 51 kg. per hectare This higher rate of use of fertilizers in the Western Maharashtra districts is because of the greater extension of irrigation in this region and the growth of high fertilizer using crops like sugarcane.

14.22.The regional imbalance in the development of agriculture is therefore associated with imbalance in the extension of irrigation, and the associated inputs like fertilizer and improved seeds. It also appears that there are no significantly high yielding/hybrid seeds yet available for unirrigated cotton and groundnut which are of considerable importance to the agricultural economy of Vidarbha and Marathwada regions. While such seeds may not be made to order, it is necessary to devote attention to these crops in the research programmes of the Agricultural Universities in the State. Similarly, it would not be

Table 14.6. Districtwise Fertilizers Consumption (N+P+K)

(Tonnes)

District (1)	1980-81 (2)	1981-82 (3)	1982-83 (4)	Total (5)	Average (6)	Kgs. per ha. (7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	6,245	8,011	5,025	19,281	6,427	23
3. Raigad	8,104	10,450	6,991	25,545	8,515	37
4. Ratnagiri	5,622	9,599	9,748	24,969	8,323	21
Konkan (Excl. G.B.)	**19,971**	**28,060**	**21,764**	**69,795**	**23,265**	**26**
5. Nashik	27,057	31,743	23,008	81,808	27,269	28
6. Dhule	27,962	31,426	25.309	84,697	28,232	37
7. Jalgaon	47,461	53,218	47814	148,493	49,498	51
8. Ahmednagar	28,694	34,619	26,019	80,332	29.777	..
9. Pune	17,814	35,079	41,186	94,079	31,360	27
10. Satara	20,070	21,507	13,281	54,858	18,286	25
11. Sangli	18,684	22,107	16,695	57,486	18,162	29
12. Solapur	15,893	18,878	20,290	55,061	18,354	15
13. Kolhapur	59,759	61,955	56,324	168,038	56,013	128
Western Maharashtra	**253,394**	**310,532**	**269,926**	**833,852**	**277,951**	**34**
14. Aurangabad	22,400	22,976	27,679	73,055	24,352	18
15. Parbhani	8,702	10,884	12,727	32,313	10,771	9
16. Beed	4,838	6,370	7,303	18,531	6,177	7
17. Nanded	10,047	14,791	13,930	38,768	12,923	17
18. Osmanabad	8,916	13,097	10,279	32,292	10,764	8
Marathwada	**54,923**	**68,118**	**71,918**	**194,959**	**64,987**	**12**
19. Buldhana	16,284	28,536	24,736	69,556	23,185	29
20. Akola	11,714	15,824	18,144	45,682	15,227	18
21. Amravati	16,744	18,632	18,437	53,813	17,938	23
22. Yavatmal	10,684	13,229	13,700	37,613	12,538	14
23. Wardha	8,400	9,779	18,193	36,372	12,124	26
24. Nagpur	17,270	19,469	27,287	64,026	21,342	34
25. Bhandara	7,086	9,115	9,761	25,962	8,654	16
26. Chandrapur	6,816	8,037	11,807	26,660	8,887	12
Vidarbha	**94,998**	**122,621**	**142,065**	**359,684**	**119,895**	**21**
Maharashtra State	**423,286**	**529,331**	**505,673**	**1,458,290**	**486,098**	**24**
Maharashtra state (Excl. G.B.)	**423,286**	**529,331**	**505,673**	**1,458,290**	**486,098**	**24**

enough to extend irrigation to the hitherto unirrigated areas; it is necessary to design investigations to firmly establish the best manner of application of water, taking the nature of soil into consideration, and the suitable' crops and crop rotations. It is important for the research centres of the Agricultural Universities to start research and extension projects on water use and management. This aspect is briefly discussed later along with agricultural education.

Groundwater Development:

14.23. As already mentioned, irrigation is the basis of agricultural development in Maharashtra as it is in other parts of the country. But, Maharashtra is a largely unirrigated State. As earlier mentioned, in 1978-79, only 11.89 per cent of the gross cropped area was irrigated from ail sources (Col. 2 of Table 14.2). The two principal sources, namely, surface water and groundwater, contribute- more or less equally to irrigation in Maharashtra. In Chapter VII, we have already examined the development of the disparities in surface water irrigation. Here we shall briefly examine the situation in groundwater irrigation.

Table 14.7. Ground Water Potential in 1979

District (1)	Net Recharge in MCM (2)	Percentage Exploitation (3)	Number of Wells in use in 1978-79 (4)	Number of Additional Wells Feasible @0.015 (5)
1. Greater Bombay	..	..	..	..
2. Thane	1,176.056	4.90	7,591	75,884
3. Raigad	910.841	1.29	4,750	59,930
4. Ratnagiri	1,223.840	4.35	10,857	78,035
Konkan (Excl. G.B.)	**3,310.737**	**3.70**	**23,198**	**213,849**
5. Nashik	1,787.970	36.87	74,182	75,260
6. Dhule	1,263.250	30.48	26,745	60,780
7. Jalgaon	1,238.580	47.84	49,676	47,670
8. Ahmednagar	1,424.035	60.89	84,125	42,328
9. Pune	1,678.391	27.13	60,272	81,503
10. Satara	1,412.688	20.09	40,171	75,235
11. Sangli	785.320	70.35	43,891	19,200
12. Solapur	1,345.989	40.22	55,913	53,619
13. Kolhapur	1,208.264	22.85	15,866	62,131
Western Maharashtra	**12,144.487**	**37.99**	**450,841**	**517,726**
14. Aurangabad	1,505.160	33.07	74,329	67,946
15. Parbhani	1,451.700	17.31	26,793	80,013
16. Beed	927.648	25.00	33,152	46,372
17. Nanded	1,442.110	10.06	12,024	86,436
18. Osmanabad	1,321.710	28.04	44,642	63,421
Marathwada	**6,648.328**	**22.51**	**190,940**	**344,188**
19. Buldhana	1,051.120	21.43	25,043	55,044
20. Akola	1,173.640	11.95	12,999	68,879
21. Amravati	1,092.430	22.44	28,457	56,995
22. Yavatmal	1,574.720	6.00	14,874	98,678
23. Wardha	668.210	25.70	16,084	33,085
24. Nagpur	1,819.950	15.46	31,174	10,256
25. Bhandara	1,923.370	3.00	11,749	124,560
26. Chandrapur	3,588.400	1.17	10,949	236,423
Vidarbha	**12,891.840**	**9.76**	**151,329**	**683,920**
Maharashtra State	**34,995.392**	**21.40**	**816,308**	**1,759,683**
Maharashtra State (Excl. G.B.)	**34,995.392**	**21.40**	**816,308**	**1,759,683**

14.24. While the development of surface water irrigation has been almost wholly the responsibility of Government and has been done at public cost, the development of groundwater resources in Maharashtra has been done by private effort and at private cost. The development is mostly by means of open wells dug and constructed at the initiative of the individual cultivator financed only partly by the financial institutions like the Land Development Bank, and Commercial Banks. The role of the Government is essentially providing information, giving subsidies including -writing off a part of the loan in case of failed wells, and regulating location of wells in so far as these are sunk with borrowed funds. In view of the nature of the underground geological structure, sinking of wells in most parts of the State has been a gamble.

14.25. Till the end of the sixties no geo-hydrological information about underground water potential was available. In July 1971. the State Government set up a Groundwater Survey Agency which has been estimating the groundwater potential in the State. These estimates are made separately for a large number of small water-sheds into which every district is divided for the purpose. These. estimates are continuously improved by the Agency, The latest information available for the purpose, relating to 1979, is presented in Table 14.7. Cols. 2 and 3 show the total ground water recharge and. the percentage of it already being exploited, respectively. Cols. 4 and 5 show the number of wells in use for irrigation and the additional number that can be sunk. The data show that 21.40 per cent of the estimated groundwater in the State was already being exploited in 1979. But the rate of exploitation varied widely between regions and districts. Konkan region had the lowest exploitation rate, 3.70 per cent, and all the districts in Konkan had less than 5 pet cent rate of exploitation. Vidarbha region had also a very low

rate of exploitation, 9.76 per cent; three districts in the region, Chandrapur. Bhandara and Yavatmal with the highest recharge of groundwater, had vary poor exploitation, 1.17, 3.00 and 6.00 per cent, respectively. Three other districts in the region, Buldhana, Amravati and Wardha had exploitation rates equal to or a little higher than the State average Marathwada region's rate of exploitation was equal to the State average, but two of the five districts,Nanded and Parbhani, had much lower rates of exploitation. Western Maharashtra had the highest rates of exploitation 37.99 per cent, which is almost twice the State average The highest rates of exploitation were in Sangli 70 35 per cent, Ahmednagar 60.89 per cent, Jalgaon 47.84 per cent and Solapur 40.22 per cent. Only Satara's rate' of exploitation was just below the State average.

14.26. Initiative in regard to sinking wells for irrigation has to be taken by the cultivators. Neverthe less, it is necessary to devote special attention in this matter to the districts of Konkan, to Nanded and Parbhani in Marathwada, and to Akola, Yavatmal, Nagpur, Bhandara and Chandrapur in Vidarbha region. The agricultural extension agency as well as the financing agencies like the L. D.B.'s and commercial banks that provide term-loans for the purpose should give special attention to these districts to see that farmers come forward to sink wells for irrigation.

14.27. One of the features that deserves special attention in this respect, is the inadequate use of the existing wells in certain regions of the. State. Table 14.8 gives the percentage of irrigation wells in use in 1960-61 and 1978-79, the latest year for which data were available. The table shows that for the State as a whole 83.93 per cent of the irrigation wells were in use in 1960-61, and this improved only slightly to 85.60 per cent by 1978-79. But the significant point to note is the much lower use of available wells for irrigation

in the Vidarbha districts where only about two-thirds of the wells were being used in 1978-79. In the light of the poor overall irrigation facility in this region, the lower rate of use of existing wells calls for special investigation and remedial action.

14.28. The problem is further underlined by the fact that in recent years a very large proportion of the failed wells deserving subsidy from the State Government, was in the Vidarbha districts. Table 14.9 gives the number of wells undertaken during the three years 1980-83, which failed and had therefore been subsidised by the State Government or were under consideration for the purpose. This of course should be compared with the total number of wells that were sunk years, in order to know about the extent of failure of wells. But that information was not during these three

Table 14.8. Percentage of Total Irrigation Wells in Use

District	1960-61			1978-79		
	Irrigation Wells	Irrigation Wells in Use	Col. (3) as Percentage of Col. (2)	Irrigation Wells	Irrigation Wells in Use	Col. (6) as Percentage of Col. (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	6,557	6,245	95.24	8,074	7,591	94.02
3. Raigad	4,180	3,748	89.67	5,252	4,750	90.44
4. Ratnagiri	15,304	13,175	86.09	14,177	10,857	76.58
Konkan (Excl. G.B)	**26,041**	**23,168**	**88.97**	**27,503**	**23,198**	**84.35**
5. Nashik	57,909	54,883	94.77	77,876	74.182	95.26
6. Dhule	14,002	12,487	89.18	30,957	26,745	86.39
7. Jalgaon	50,426	38,921	77.18	57,668	49,676	86.14
8. Ahmednagar	70,569	66.494	94.23	93,419	84,125	90.05
9. Pune	46,027	40,587	88.18	64,952	60,272	92.79
10. Satara	33,169	28,492	85.90	43,876	40,171	91.56
11. Sangli	36,742	32,966	89.72	47,358	43,891	92.68
12. Solapur	50,052	47,033	93.97	59,772	55,913	93.54
13. Kolhapur	12,731	11,325	88.96	18,041	15,866	87.94
Western Maharashtra	**371,627**	**333,188**	**89.66**	**493,919**	**450,841**	**91.28**
14. Aurangabad	41,128	37,966	92.31	79,449	74,329	93.56
15. Parbhani	16,560	14,752	89.08	29,568	26,793	90.61
16. Beed	32,612	30,581	93.77	35,135	33,152	94.36
17. Nanded	7,390	6,747	91.30	12,276	12,024	97.95
18. Osmanabad	19,942	16,917	84.83	48,838	44,642	91.41
Marathwada	**117,632**	**106.963**	**90.93**	**205,266**	**190,940**	**93.02**
19. Buldhana	21,540	13,498	62.66	34,642	25,043	72.29
20. Akola	9,487	3,937	41.50	20,918	12,999	62.14
21. Amravati	19,024	13,846	72.78	34,598	28,457	82.85
22. Yavatmal	8,794	5,391	61.30	19,570	14,874	76.00
23. Wardha	17,245	6,932	40.20	28,109	16,084	57.22
24. Nagpur	32,667	20,073	61.45	57,861	31,174	53.88
25. Bhandara	12,083	8,344	69.06	16,033	11,749	73.28
26. Chandrapur	9,672	6,691	69.18	15,197	10,949	72.03
Vidarbha	**130,512**	**78,712**	**60.31**	**226,928**	**151,329**	**66.69**
Maharashtra State	**645,812**	**542,031**	**83.93**	**953,616**	**816,308**	**85.60**
Maharashtra State (Excl.G.B.)	**645,812**	**542,031**	**83.93**	**953,616**	**816,308**	**85.60**

Table 14.9. Failed Well Subsidy Scheme: Number of Cases Settled during 1980-83 and Number Pending on 1983

District (1)	Number of Cases Settled for 1980-83. (2)	Number of Cases Pending on 1-4-1983 (3)	Total Cols. (2) +(3) (4)	Percentage to State Total (5)
1. Greater Bombay	..	..	..	..
2. Thane	65	2	67	0.78
3. Raigad	61	6	67	0.78
4. Ratnagiri	3	2	5	0.06
Konkan (Excl. G.B.)	129	10	139	1.62
5. Nashik	136	8	144	1.68
6. Dhule	120	3	123	1.44
7. Jalgaon	135	49	184	2.15
8. Ahmednagar	239	145	384	4.49
9. Pune	109	11	120	1.40
10. Satara	118	6	124	1.45
11. Sangli	62	9	71	0.83
12. Solapur	188	123	311	3.64
13. Kolhapur	231	61	292	3.41
Western Maharashtra	1,338	415	1,753	20.49
14. Aurangabad	198	1,160	1,358	15.88
15. Parbhani	171	46	217	2.54
16. Beed	125	49	174	2.03
17. Nanded	35	12	47	0.55
18. Osmanabad	170	303	473	5.53
Marathwada	699	1,570	2,269	26.53
19. Buldhana	67	452	519	6.07
20. Akola	356	458	814	9.52
21. Amravati	117	170	287	3.36
22. Yavatmal	373	764	1,137	13.29
23. Wardha	163	260	423	4.95
24. Nagpur	196	132	328	3.83
25. Bhandara	157	18	175	2.05
26. Chandrapur	177	533	710	8.30
Vidarbha	1,606	2,787	4,393	51.36
Maharashtra State	3,772	4,782	8,554	100.00
Maharashtra State (Excl.G.B.)	3,772	4,782	8,554	100.00

available. Nevertheless, the fact that more than half the wells that failed during these three years were in the Vidarbha districts and more than one-fourth in the Marathwada districts is in itself a matter that deserves careful investigation in the light of the greater need for and potential of development of irrigation in the region.

Land Development and Soil Conservation:

14.29. Besides construction of large, medium and small irrigation projects, the State Govern-ment has been undertaking land development work in areas covered by the existing and new projects. The land development work includes levelling the fields under command, as well as constructing water courses from the outlets on the minor canals or distributories to the head of the fields. A part of this work on select large scale surface irrigation projects is undertaken by the Command Area Development Authority created for the purpose. The land development work in the remaining command areas is undertaken by the Department of Agriculture.

14.30. Table 14.10 gives the cultivable command area (C.C.A.) under each surface irrigation project in the State taken up for land development, etc., work by CADA aggregated districtwise, the area out of this on which such.work was about to be completed by the 31st of March 1984, and the backlog of work in different districts For a few of the projects information about the C. C. A. was available for the project as a whole, without a districtwise break-up, In such cases the C. C. A. was distributed among the districts in the same proportion in which the total irrigate area under the project was .distributed among the districts. CADA work is divided into two types: Part I refers to work of land development to be carried out on the farmer's field, and Part II refers to community works, that is, works like construction of water courses, distribution boxes, etc. The area covered by these works would be the total C. C. A. It appears that Part I works were to be completed in 32.12 per cent of the C.C.A. and Part II works were to be completed in 28.83 per cent of the

Table 14.10. Estimated Backlog in Land Development Work in Projects under CADA

District	Total Culturable Command Area	Land Development Work expected to be completed by March 1984		Percentage of Col. (3) to Col. (2)	Percentage of Col. (4) to Col (2)
		Part I Works	Part II Works ('000 hectares)		
(1)	(2)	(3)	(4)	(5)	(6)
1. Greater Bombay	..	..	..	..	..
2. Thane	..	..	..	..	..
3. Raigad	..	..	..	..	..
4. Ratnagiri	..	..	..	..	..
Konkan (Excl G. B.)	..	..	..	..	..
5. Nashik	3.70	3.50	3.50	94.59	94.59
6. Dhule	1.10	..	..	0.00	0.00
7. Jalgaon	163.00	84.80	79.20	52.02	48.59
8. Ahmednagar	226.70	127.30	106.90	56.15	47.15
9. Pune	96.60	10.90	8.60	11.28	8.90
10. Satara	81.80	32.50	20.80	39.73	25.43
11. Sangli	87.80	0.20	0.90	0.23	1.03
12. Solapur	256.70	27.30	30.20	10.63	11.76
13. Kolhapur	46.20	..	..	0.00	0.00
Western Maharashtra	963.60	286.50	250.10	29.73	25.95
14. Aurangabad	..	..	..	..	..
15. Parbhani	75.90	0.60	0.60	0.79	0.79
16. Beed	..	..	..	..	..
17. Nanded	145.30	1.60	0.40	1.10	0.28
18. Osmanabad	..	..	..	..	..
Marathwada	221.20	2.20	1.00	0.99	0.05
19. Buldhana	..	..	..	..	..
20. Akola	..	..	..	..	..
21. Amravati	..	..	..	..	..
22. Yavatmal	16.40	1.60	..	9.76	..
23. Wardha	..	..	..	..	..
24. Nagpur	129.30	17.00	14.00	13.15	1.24
25. Bhandara	..	..	..	..	..
26. Chandrapur	..	..	..	..	..
Vidarbha	145.70	18.60	14.00	12.77	9.61
Jayakwadi Project	354.70	147.00	128.00	41.44	36.09
Itiadoh Project	26.40	18.00	19.00	68.18	68.18
Maharashtra State (Excl.G.B.)	1,739.70	558.80	501.60	32.12	28.83

Table 14.10-A. Estimated Cost of Backlog, in Land Development Work in Projects under CADA

| District | Backlog in Land Development Work | | | Cost of Col (4) @ Rs. 2,000 per ha. (Rs. in Lakh) |
| | Part I Works | Part II Works | Total | |
(1)	('000 hectares) (2)	(3)	(4)	(5)
1. Greater Bombay	..	..	..	..
2. Thane	..	..	..	..
3. Raigad	..	..	..	..
4. Ratnagiri	..	..	..	..
Konkan (Excl G. B.)	..	..	..	..
5. Nashik	..	..	..	..
6. Dhule	0.35	1.06	1.41	28.20
7. Jalgaon	..	..	..	..
8. Ahmednagar	..	..	..	..
9. Pune	20.13	19.25	39.38	787.60
10. Satara		2.78	2.78	55.60
11. Sangli	28.00	24.41	52.41	1,048.20
12. Solapur	55.15	43.81	98.96	1,979.20
13. Kolhapur	14.84	13.32	28.16	563.20
Western Maharashtra	**118.47**	**104.63**	**223.10**	**4,462.00**
14. Aurangabad	..	..	..	..
15. Parbhani	23.78	21.28	45.06	901.20
16. Beed	..	..	..	..
17. Nanded	45.07	41.49	86.56	1,731.20
18. Osmanabad	..	..	..	..
Marathwada	**68.85**	**62.77**	**131.62**	**2,632.40**
19. Buldhana	..	..	..	..
20. Akola	..	..	..	..
21. Amravati	..	..	..	..
22. Yavatmal	3.67	5.27	8.94	178.80
23. Wardha	..	..	..	..
24. Nagpur	24.53	23.28	47.81	956.20
25. Bhandara	..	..	..	..
26. Chandrapur	..	..	..	..
Vidarbha	28.20	28.55	56.75	1,135.00
Maharashtra State	215.52	195.95	411.47	8,229.40
Maharashtra State (Excl. G.B.)	215.52	195.95	411.47	8,229.40

the C.C.A. under CADA by end of March 1984. Cols, 5 and 6 of Table give the percentage of work completed districtwise by March 1984. In Table 14.10A the backlog of the work to be done in districts where the achievement was below State average has been worked out. We were informed that on an average it will cost Rs. 2,000 per hectare to complete each type of work. Therefore, Col. 5 in Table 14.10A gives the total estimated expenditure to bring the below average districts to the State average in both Part I and Part II types of work.

14.31. The Department of Agriculture undertakes similar land development work in the command areas not covered by CADA. Table 14.11 gives districtwise, the total culturable command area (C.C.A.) available for land development work and the area in which such work had been completed upto March 1983. Col. 4 of the table shows that in the State as a whole, of the C C A. available for such work by the

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Table 14.11. Land Development under Major, Medium and Minor Irrigation Projects in Non-CADA Sector up to March 1983

(Area in Hectares)

District (1)	C. C. A. (2)	C. C. A. Available for work (3)	Land Development Work done upto March 1983 (4)	Col. (4) as Percentage to Col. (3) (5)	Backlog (6)	Cost* (Rs. in Lakh) (7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	52,391	1,151	189	16.42	683	2.78
3. Raigad	9,725	9,725	8,628	88.72	..	..
4. Ratnagiri	..	..	..	..	..	..
Konkan (Excl. G.B.)	**62,116**	**10,876**	**8,817**	**81.07**	**683**	**2.78**
5. Nashik	107,755	105,350	81,285	77.16	..	..
6. Dhule	32,440	27,098	27,185	100.32	..	..
7. Jalgaon	24,765	23,396	20,861	89.16	..	..
8. Ahmednagar	22,071	21,910	13,876	63.13	2,763	11.65
9. Pune	34,310	32,274	20,186	62.55	4,257	12.40
10. Satara	..	..	..	..	..	..
11. Sangli	..	..	..	..	..	..
12. Solapur	20,498	18,145	10,592	58.37	3,152	7.94
13. Kolhapur	..	..	..	..	..	..
Western Maharashtra	**241,839**	**228,173**	**173,985**	**76.25**	**10,172**	**31.99**
14. Aurangabad	35,224	31,004	24,836	80.11	..	..
15. Parbhani	15,930	8,375	5,156	61.56	1,187	3.77
16. Beed	41,087	31,118	23,433	75.30	137	0.48
17. Nanded	38,362	35,376	33,126	93.64	..	..
18. Osmanabad	36,761	32,035	24,768	77.32	..	..
Marathwada	**167,364**	**137,908**	**111,319**	**80.72**	**1,324**	**4.25**
19. Buldhana	32,469	27,469	18,520	67.42	2,285	6.32
20. Akola	29,557	29,557	25,891	87.60	..	..
21. Amravati	2,541	2,541	2,537	99.84	..	..
22. Yavatmal	63,727	42,875	27,405	63.92	5,068	18.56
23. Wardha	35,360	24,550	19,756	80.47	..	..
24. Nagpur	21,925	15,584	10,541	67.64	1,262	4.36
25. Bhandara	13,685	11,156	7,352	65.90	1,098	0.35
26. Chandrapur	16,472	12,810	5,502	42.95	4,200	21.53
Vidarbha	**215,736**	**166,542**	**117,504**	**70.56**	**13,913**	**51.12**
Maharashtra State	**687,055**	**543,499**	**411,625**	**75.74**	**26,092**	**90.14**
Maharashtra State (Excl. G.B.)	**687,055**	**543,499**	**411,625**	**75.74**	**26,092**	**90.14**

* Cost calculated on each Dist. average cost shown in Table 14.12.

Department, the work had been completed on 75.74 per cent of the area. However, in the districts of Thane in Konkan, Ahmednagar, Pune and Solapur in Western Maharashtra, Parbhani and Beed in Marathwada, Buldhana, Yavatmal, Nagpur, Bhandara and Chandrapur in Vidarbha, the percentage of available C. C. A. on which work of land development had been completed by March 1983 was less than the State average. In Col. 6 of the Table is given the additional areas in these districts on which work had to be carried out to bring the districts to ,the level of the State average. The cost of developing these lands in the districts below the State average have been calculated in Col. 7 of the Table on the basis of the average par acre costs, districtwise, on EGS and non-EGS works for the purpose during the years 1979-80 to 1982-83 (given in Table 14.12). The total additional expenses to bring the districts with backlog to the level of the State average is estimated to be Rs. 90.14 lakh.

Table 14.12. Total Expenditure Incurred for Land Development Work under Non-CADA Irrigation Projects from 1979-80 to 1982-83

District (1)	Expenditure on works EGS+non-EGS (Rs. in Lakh) (2)	Land Development Work done upto March 1983 (ha.) (3)	Cost (Rs. per ha.) (4)
1. Greater Bombay	..	..	..
2. Thane	0.77	..	..
3. Raigad	..	189	407.41
4. Ratnagiri	..	8,628	..
	..	..	..
Konkan (Excl. G.B.)	**0.77**	**8,817**	..
5. Nashik	322.69	81,285	396.99
6. Dhule	66.22	27,185	243.59
7. Jalgaon	74.62	20,861	352.70
8. Ahmednagar	58.52	13,876	421.81
9. Pune	58.79	20,186	291.24
10. Satara	0.75	..	..
11. Sangli	0.15	..	..
12. Solapur	26.67	10,592	251.79
13. Kolhapur	..	..	..
Western Maharashtra	**608.42**	**173,985**	..
14. Aurangabad	98.58	24,836	396.92
15. Parbhani	16.39	5,156	317.88
16. Beed	82.05	23,433	350.15
17. Nanded	45.91	33,126	138.59
18. Osmanabad	161.54	24,768	652.21
Marathwada	**404.47**	**111,319**	**363.34**
19. Buldhana	51.21	18,520	276.51
20. Akola	48.64	25,891	187.86
21. Amravati	3.93	2,537	154.91
22. Yavatmal	100.35	27,405	366.17
23. Wardha	6.36	19,756	32.19
24. Nagpur	36.45	10,541	345.79
25. Bhandara	2.36	7,352	32.10
26. Chandrapur	28.20	5,502	512.54
Vidarbha	**277.50**	**117,504**	**236.16**
Maharashtra State	**1,291.16**	**411,625**	**313.67**
Maharashtra State (Excluding G.B.)	**1,291.16**	**411,625**	**313.67**

14.32. Since the larger part of the farm land in the State is unirrigated, dry land farming techniques are being developed and implemented in the State. These are mainly soil conservation measures. They include the following: contour bunding, terracing nala bunding, field drains; land development-cum-horticultural development and land shaping and grading on-farm dry land development and broad beds and furrows. Tables 14.13 (Contour Bunding), 14.14 (Terracing), 14.15 (Nala Bunding), and 14.16 (Land Development-cum-Horticultural Development) give the estimated potential of respective work in each district and the area on which the particular work has been done by the Agricultural Department upto 31st March 1983. The fourth column under each head presents the work-done as percentage of the ultimate potential. In Col. 5 is estimated the backlog of work in the districts which are below the State average. In Col. 6 is presented the estimated cost of completing this backlog. The cost estimates in every case are based on the latest per unit costs estimated by the Directorate of Agriculture. Work on three of the

Table 14.13. Contour Bunding Work as on 31st March 1983

District	Potential	Work Done	Percentage of Col. (3) to Col. (2)	Backlog of Contour Bunding (Lakh ha.)	Cost @ Rs. 450 per hectare (Rs. Lakh)
(1)	(Lakh hectares) (2)	(3)	(4)	(5)	(6)
1. Greater Bombay	..	..	..	..	..
2. Thane	..	..	..	..	..
3. Raigad	..	..	..	..	..
4. Ratnagiri	..	..	..	..	..
Konkan (Excl G.B.)	..	..	..	..	..
5. Nashik	5.52	4.86	88.04	..	..
6. Dhule	5.06	5.00	98.81	..	..
7. Jalgaon	7.67	4.94	64.41	0.38	171.00
8. Ahmednagar	7.26	6.11	84.16	..	..
9. Pune	5.07	4.43	87.38	..	..
10. Satara	4.89	1.95	39.88	1.44	648.00
11. Sangli	4.05	3.47	85.68	..	..
12. Solapur	9.95	7.91	79.50	..	..
13. Kolhapur	0.46	0.36	78.26	..	..
Western Maharashtra	49.93	39.03	78.17	1.82	819.00
14. Aurangabad	7.61	7.22	94.88	..	..
15. Parbhani	8.58	4.36	50.82	1.59	715.50
16. Beed	7.91	5.41	68.39	0.08	36.00
17. Nanded	4.78	3.23	67.57	0.09	40.50
18. Osmanabad	12.19	8.69	71.29	..	..
Marathwada	41.07	28.91	70.39	1.76	792.00
19. Buldhana	4.46	4.43	99.33	..	..
20. Akola	8.20	3.74	45.61	1.95	887.50
21. Amravati	4.83	2.70	55.90	0.65	292.50
22. Yavatmal	7.36	4.31	58.56	0.80	360.00
23. Wardha	3.50	1.62	46.29	0.81	364.50
24. Nagpur	2.78	1.89	67.99	0.04	18.00
25. Bhandara	..	..	..	..	..
26. Chandrapur	3.58	0.60	16.76	1.88	846.00
Vidarbha	34.71	19.29	55.57	6.13	2,768.50
Maharashtra State	125.71	87.23	69.39	9.71	4,379.50
Maharashtra State (Excl. G.B.)	125.71	87.23	69.39	9.71	4,379.50

eight different types of soil conservation work, namely, land shaping and grading, on-farm dry land development, and broad beds and furrows had hardly begun in. the State by 31st March 1983. In matter of these works therefore, it is advisable to start work in different districts in proportion to the potential for such works in the districts. In case of field drains, while the physical backlog can be estimated, the estimate of per hectare costs for this type of work was not readily available, and hence the backlog in money terms could not be estimated. The current backlog in the other four types of soil conservation work amount to Rs. 94.57 crore.

Table 14.14. Terracing Work as on 31st March 1982

District (1)	Potential (2)	Work Done (3)	Percentage of Col. (6) to Col. (5) (4)	Backlog of Terracing (Lakh ha.) (5)	Cost @ Rs. 3,750 per ha. (Rs. in Lakh) (6)
	(Lakh hectares)				
1. Greater Bombay	..	..	..	..	..
2. Thane	0.31	0.16	51.61	..	..
3. Raigad	0.19	0.11	57.89	..	..
4. Ratnagiri	1.98	0.06	3.03	0.36	1,350.00
Konkan (Excl. G. B.)	2.48	0.33	13.31	0.36	1,350.00
5. Nashik	0.48	0.17	35.42	..	..
6. Dhule	..	..	..	..	..
7. Jalgaon	..	..	..	..	..
8. Ahmednagar	0.01	0.01	100.00	..	..
9. Pune	0.33	0.14	42.42	..	..
10. Satara	0.71	0.12	16.90	0.03	112.50
11. Sangli	0.01	0.01	100.00	..	..
12. Solapur	..	..	..	..	..
13. Kolhapur	0.75	0.22	29.33	..	..
Western Maharashtra	2.29	0.67	29.26	0.03	112.50
14. Aurangabad	..	..	..	..	..
15. Parbhani	..	..	..	..	..
16. Beed	..	..	..	..	..
17. Nanded	..	..	..	..	..
18. Osmanabad	..	..	..	..	..
Marathwada	..	..	..	..	..
19. Buldhana	..	..	..	..	..
20. Akola	..	..	..	..	..
21. Amravati	..	..	..	..	..
22. Yavatmal	..	..	..	..	..
23. Wardha	..	..	..	..	..
24. Nagpur	0.14	0.13	92.86	..	..
25. Bhandara	1.44	0.46	31.94	..	..
26. Chandrapur	2.32	0.26	11.21	0.24	900.00
Vidarbha	3.90	0.85	21.79	0.24	900.00
Maharashtra State	8.67	1.85	21.34	0.63	2,362.50
Maharashtra State (Excl. G.B.)	8.67	1.85	21.34	0.63	2,362.50

14.33. Besides land development and soil conservation work on irrigated and dry land, the Department of Agriculture undertakes specific crop development schemes, as well as specific schemes relating to tribal areas, drought-prone areas and Western-Ghat development By their nature these are region specific. More over, it is not possible to estimate backlog in this matter without a physical estimation of potential, which is not always possible, and for which, information, in any case, is not available to the Committee. Therefore, these are not being taken up here. However, it is necessary, wherever possible, to estimate district/talukawise backlog on the basis of physical achievements and allocate funds for expenditure accordingly.

Agricultural Extension and Education:

14.34. Finally, we wish to review the regional distribution of extension of agricultural (including animal husbandry) education and research in the State. Agricultural education is carried out in exclusive agricultural schools, agriculture

Table 14.15. Nala Bunding Work as on 31st March 1983

District (1)	Potential (Nos.) (2)	Work Done (Nos.) (3)	Percentage of Col. (3) to Col. (2) (4)	Backlog in LDHD (Numbers) (5)	Cost @ Rs. 0.50 lakh per Nala (Rs. in Lakh) (6)
1. Greater Bombay	..	..	..	..	..
2. Thane	197	62	31.79	95	47.50
3. Raigad	..	..	..	..	..
4. Ratnagiri	..	2	..	..	..
Konkan (Excl. G. B.)	197	64	32.49	95	47.50
5. Nashik	5,044	4,842	95.96	..	..
6. Dhule	2,777	2,777	100.00	..	..
7. Jalgaon	2,558	2,558	100.00	..	..
8. Ahmednagar	5,813	5,599	96.32	..	..
9. Pune	3,961	3,961	100.00	..	..
10. Satara	2,616	2,559	97.82	..	..
11. Sangli	2,329	2,044	87.76	..	..
12. Solapur	5,432	5,105	93.98	..	..
13. Kolhapur	202	43	21.29	120	60.00
Western Maharashtra	30,732	29,488	95.95	120	60.00
14. Aurangabad	2,324	1,482	63.77	390	195.00
15. Parbhani	560	93	16.61	358	179.00
16. Beed	3,269	2,229	68.19	405	202.50
17. Nanded	575	65	11.30	398	199.00
18. Osmanabad	1,748	556	31.81	852	426.00
Marathwada	8,476	4,425	52.21	2,403	1,201.50
19. Buldhana	1,292	595	46.05	446	223.00
20. Akola	800	410	51.25	235	117.50
21. Amravati	700	311	44.43	253	125.50
22. Yavatmal	1,000	439	43.90	367	183.50
23. Wardha	700	82	11.71	482	241.00
24. Nagpur	923	280	30.34	464	232.00
25. Bhandara	104	98	94.23	..	..
26. Chandrapur	17	17	100.00	..	..
Vidarbha	5,536	2,232	40.32	2,247	1,122.50
Maharashtra State	44,941	36,209	80.57	4,865	2,431.50
Maharashtra State (Excl. G.B.)	..	..	..	4,865	2,431.50

colleges and in postgraduate departments of the four agricultural universities in the State, located in the four regions of Konkan, Western, Maharashtra, Marathwada and Vidarbha. (Certain Secondary/Higher Secondary Schools also teach agriculture as a subject. But these are not being considered here). Table 14.17 presents information about capacity of the agricultural schools, colleges and universities, districtwise. Research in agriculture is carried out by the four universities in the research stations at the place of the Universities, as well as in a chain of research stations located in different districts. Most of these had been established by the State Government, and were transferred to the Universities after they came into being. Table 14.17 A also gives the number of such research stations in each district and their specifications.

14.35. Every district, except the newly created ones and the district of Amravati, has one agricultural school with a normal intake capacity of 50 to 60 students. These students, after they pass out, are mostly absorbed in different activities of the agricultural department and related public and private agencies. The present intake capacity in

Table 14.16. Land Development-cum-Horticultural Development as on 31st March 1983

District (1)	Potential (ha.) (2)	Work Done (ha.) (3)	Percentage of Col. (3) to Col. (2) (4)	Backlog in LDHD (ha.) (5)	Cost @ Rs. 3,450 per ha. (Rs. Lakh) (6)
1. Greater Bombay	..	..	..	..	..
2. Thane	55,000	9,317	16.94	533	18.39
3. Raigad	58,000	9,115	15.72	1,273	43.92
4. Ratnagiri	360,939	71,302	19.75	..	..
Konkan (Excl. G.B.)	473,939	89,734	18.93	1,806	62.31
5. Nashik	523	141	26.96	..	..
6. Dhule	319	63	19.75	..	..
7. Jalgaon	..	..	..	..	..
8. Ahmednagar	100	100	100.00	..	..
9. Pune	556	549	98.74	..	..
10. Satara	200	139	69.50	..	..
11. Sangli	200	102	51.00	..	..
12. Solapur	..	..	..	..	..
13. Kolhapur	55,979	3,667	6.55	6,359	219.39
Western Maharashtra	57,877	4,761	8.23	6,359	219.39
14. Aurangabad	225	67	29.78	..	..
15. Parbhani	12	12	100.00	..	..
16. Beed	200	..	..	..	..
17. Nanded	..	..	..	36	1.24
18. Osmanabad	..	..	..	..	..
Marathwada	457	79	17.29	36	1.24
19. Buldhana	724	724	100.00	..	..
20. Akola	28	28	100.00	..	..
21. Amravati	200	2	1.00	34	1.17
22. Yavatmal	200	94	47.00	..	..
23. Wardha	144	144	100.00	..	..
24. Nagpur	..	..	..	..	..
25. Bhandara	..	..	..	..	..
26. Chandarapur	..	..	..	..	..
Vidarbha	1,476	992	67.21	34	1.17
Maharashtra State	533,749	95,566	17.91	8,235	284.11
Maharashtra State (Excl. G.B.)	533,749	95,566	17.91	8,235	284.11

different districts appears satisfactory. However, the newly created districts as the district of Amravati should have a school each, with intake capacity of 50 or 60 students.

14.36. Intake capacity of the agricultural colleges for undergraduate degree in agriculture varies between regions. The Konkan districts have 80 seats (besides 20 for fisheries), while the three colleges in Western Maharashtra (in Dhule, Pune and Kolhapur) have a total, intake capacity of 480 plus 20 per agricultural engineering, the one College in Parbhani for Marathwada a capacity of 284, and the four colleges in Vidar

bha (at Akola, Amravati, Nagpur and Chandrapur) a total intake capacity of 432. If we compare the in take capacity of agricultural colleges per one lakh hectares of net sown area in the four regions separately, we find that Konkan (1.22) and Vidarbha (0.84) have higher number of seats per one lakh hectares, while Western Maharashtra (0.68) and Marathwada (0.58) have smaller number, compared to the State average (0.72). When the time for expansion of intake capacity arises, therefore, Marathwada and Western Maharashtra's requirements should have precedence, so that they are brought to the level of the State average.

Table 14.17. Teaching and Training Facilities in Agriculture

District (1)	Gram Sevak Training (2)	Agricultural Schools (Capacity : Number of Seats) (3)	Agricultural Colleges (4)	University/ Post Graduate (5)
1. Greater Bombay	..	..	75+	25+
2. Thane	60	50	..	..
3. Raigad	..	30	..	..
4. Ratnagiri	..	50	100*	54
Konkan(Excl. G.B.)	60	130	100	54
5. Nashik	..	60	..	..
6. Dhule	..	50	100	..
7. Jalgaon	..	60	..	..
8. Ahmednagar	..	50	..	..
9. Pune	356	50	20++	201
10. Satara	..	50	190	..
11. Sangli	..	50	..	..
12. Solapur	..	50	..	..
13. Kolhapur	94	50	190	..
Western Maharashtra	450	470	500	201
14. Aurangabad	350	60	..	..
15. Parbhani	350	60	284	182
16. Beed	..	60	..	..
17. Nanded	..	60	..	..
18. Osmanabad	..	60	..	..
Marathwada	700	300	284	182
19. Buldhana	n.a.	60	..	..
20. Akola	..	60	112	114
21. Amravati	..	..	128	..
22. Yavatmal	..	60	..	..
23. Wardha	..	60	..	..
24. Nagpur	..	60	128+100+	54+12+
25. Bhandara	..	60	..	..
26. Chandrapur	n.a.	60	64	..
Vidarbha	..	420	532	180
Maharashtra State	1,210	1,320	1,416	642
Maharashtra State (Excl. G.B.)	1,210	1,320	1,416	617

+ Veterinary
* 20 for fisheries
++ Engineering
n.a. Not Available

14.37. Besides the four Agricultural University Centres, every district in the State has at least one or more agricultural research centres. Since soil,. climate and crop patterns differ from region to region, it is necessary to have research stations that can carry on-research relating to crops specific to localities, particularly with a view to studying the adaptability of new varieties/practices to the areas. Table 14.17-A shows that while the districts in Konkan and Western Maharashtra had mostly 2 or more research stations in each district, specific to different crops and fairly distributed over the districts, in most of the districts of Marathwada and Vidarbha there was only one research station. In the whole of Marathwada, there was only one research station for pulses and only one for jowar. While growing of wheat under irrigated con

Table 14.17A. Research Facilities in Agriculture

	District (1)	Number-of Research Stations (2)	Subjects of Research undertaken (3)
1.	Greater Bombay		
2.	Thane	2	Paddy, Grass, Vegetables
3.	Raigad	4	Rice, Ragi, Arecanut, Khar lands
4.	Ratnagiri	7	Rice, Coconut, Nagli, Mango, Cashewnut; Soil Conservation; Besides University Centre.
5.	Nashik	5	Wheat, Paddy and Niger, Grapes, Onion, Betel; Cattle
6.	Dhule	1	Jowar and Groundnut
7.	Jalgaon	2	Oilseeds, Jowar and Banana
8.	Ahmednagar	3	Cotton, Citrus; Dry Farming; Besides University Research Station.
9.	Pune	3	Paddy, Fruit and Vegetables
10.	Satara	3	Sugar, Irrigated Cotton Wheat, Jowar, Groundnut
11.	Sangli	1	Sunflower, Jowar, Turmeric
12.	Solapur	3	Jowar and Pulses; Soils; Dry Farming.
13.	Kolhapur	3	Sugarcane, Jowar, Groundnut, Paddy.
14.	Aurangabad	3	Fruits, flowers, Pulses, Bajra
15.	Parbhani	8	Cotton, Jowar, Paddy, Sugarcane; Sericulture; Dry-land Farming; Nursery; Meteorology; (All but one at University Centre).
16.	Beed	1	Oilseeds
17.	Nanded	1	Cotton
18.	Osmanabad	1	Cotton, Oilseeds, Paddy
19.	Buldhana	1	Cotton, Safflower, Pulses
20.	Akola	2	Wheat, Cotton; Livestock; University Research Station for Cotton, Jowar, Pulses, Oilseeds, Horticulture
21.	Amravati	2	Jowar, Bajra, Oilseeds, Cotton, Pulses
22.	Yavatmal	1	Jowar, Pulses
23.	Wardha	1	Cotton, Pulses
24.	Nagpur	3	Rabi pulses, Paddy, Citrus, Betel Vine
25.	Bhandara	2	Paddy, Sugarcane
26.	Chandrapur	2	Paddy, Rabi jowar, Oilseeds

ditions is being advocated in this region, there appears to be no research station devoted to developing wheat strains suitable to the climate and soil of the region. Similarly, in Vidarbha wheat research appears to be confined to one research station in Akola. No high yielding or hybrid variety of cotton under unirrigated condition has been developed so far in these two regions. The same appears largely the case with groundnut and tur, two of the other important crops of the region. And, finally, as noted earlier, it is high time research attention was directed to the problem of irrigated cropping in the region, particularly the manner and pattern of water use,

in view of the heavy black cotton soil in many of the districts there. The desired benefits of increased investment in irrigation depend upon sound water-use technology and pro per crop pattern, which have to be experimented and established early. Resources devoted to this end will lay a sound foundation for ther agricultural development of the region.

14.38. Finally, in Table 14.18 we bring together the total cost of backlog in land development and soil conservation. This adds up to Rs. 177.77 crore.

Table 14.18. Cost of Backlog in Land Development and Soil Conservation

(Rs. in Lakh)

District	Land Development Work		Counter Bunding	Nala Bunding	Land Deve-lopment cum Horticultural Development	Total
	by CADA	in non-CADA Areas				
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	..	2.78	..	47.50	18.39	68.67
3. Raigad	..	..	..	..	43.92	43.92
4. Ratnagiri	..	..	1,350.66*	..	..	1,350.00
Konkan (Excl. G.B.)	..	2.78	1,350.00	47.50	62.31	1,462.59
5. Nashik	..	..	..	..	..	..
6. Dhule	28.20	..	..	..	..	28.20
7. Jalgaon	..	..	171.00	..	..	171.00
8. Ahmednagar	..	11.65	..	..	..	11.65
9. Pune	787.60	12.40	..	..	..	800.00
10. Satara	55.60	..	760.50*	..	..	816.10
11. Sangli	1,048.20	..	..	..	..	1,048.20
12. Solapur	1,979.20	7.94	..	..	..	1,987.14
13. Kolhapur	563.20	..	..	60.00	219.39	35.12
Western Maharashtra	4,462.00	31.99	931.50	60.00	219.39	5,704.88
14. Aurangabad	..	..	..	195.00	..	195.00
15. Parbhani	901.20	3.77	715.50	179.00	..	1,799.47
16. Beed	..	0.48	36.00	202.50	1.24	240.22
17. Nanded	1,731.20	..	40.50	199.00	..	1,970.70
18. Osmanabad	..	..	..	426.00	..	426.00
Marathwada	2,632.40	4.25	792.00	1,201.50	1.24	4,631.39
19. Buldhana	..	6.32	..	223.00	..	229.32
20. Akola	..	..	887.50	117.50	..	1,005.00
21. Amravati	..	..	292.50	125.50	1.17	419.17
22. Yavatmal	178.80	18.56	360.00	183.50	..	740.86
23. Wardha	..	..	364.50	241.00	..	605.50
24. Nagpur	956.20	4.36	18.00	232.00	..	1,210.56
25. Bhandara	..	0.35	..	..	..	0.35
26. Chandrapur	..	21.53	1,746.00*	..	..	1,767.53
Vidharbha	1,135.00	51.12	3,668.50	1,122.50	1.17	5,978.29
Maharashtra State	8,229.40	90.14	6,742.00	2,431.50	284.11	17,777.15
Maharashtra State (Excl.G.B.)	8,229.40	90.14	6,742.00	2,431.50	284.11	17,777.15

* Inclusive of Terracing in Ratnagiri (Rs. 1,350.00 Lakh), Satara (Rs. 112.50 Lakh) and Chandrapur (Rs.900.00 Lakh) and in total (Rs. 2,362.50 Lakh).

CHAPTER XVII
PROCESS AND MECHANISM FOR
REMOVING THE BACKLOG

17.1. In Chapters VI to XVI, we have examined a number of sectors/sub-sectors/schemes/programmes, assessed the districtwise backlog in each and estimated the cost of removing the backlog. In Annexure A, we have brought these estimated costs of backlog together. It will be noticed that for all districts, excluding Greater Bombay, they aggregate to Rs. 3,177.07 crore.

17.2. We must now turn to the crucial question of how this backlog may be removed. As explained in Chapter III, outlining our Approach, we prefer to suggest measures, as far as possible, within the present framework of Planning and Development in the State. District Planning is an integral part of the present planning in the State and obviously is most relevant to our purpose. It will be useful therefore to give a brief account of the same.

District Planning & Development Councils:

17.3. We have already referred to the intention of the State Government announced by the Chief Minister in the State Assembly on August 20, 1969, to adopt district as the primary unit of planning (para 2.13) and subsequent Resolution of the Government dated October 20, 1972, to constitute a District Planning Board in each district (para 3.2). Its actual implementation began in 1974-75 with the beginning of the Fifth Five Year Plan and the District Planning Boards came to be called District Planning and Development Councils (DPDCs). The objectives of District Planning were intended to be: (a) securing full development of the natural and other resource potential of the district; and (b) attaining parity in the matter of socio-economic infrastructure

facilities over a period of 15 to 20 years so that inter-district disparities in levels of development are ironed out.

17.4. The DPDC has the functions of formulating the District Plan, monitoring the approved District Plan and bringing about co-ordination between various implementing agencies at the district level. It consists of representatives of the people from the District (MPs, MLAs and representatives of urban and rural local bodies). The designated Minister of the District is the Chairman of the DPDC and its Executive Committee. The Collector of the District is the Member-Secretary of the Executive Committee. The DPDC has to meet at least twice a year and its Executive Committee at least once a month, when progress of district level schemes is discussed.

17.5. The Panchayati Raj institutions are represented on the District Planning and Development Councils and their Executive Committees. The President of Zilla Parishad and the Chief Executive Officer of Zilla Parishad are members of the DPDC and its Executive Committee, Special Executive Committee for Tribal Areas Sub-Plan and also of the small Committee which formulates the Annual Plan proposals of the District. Chairmen of the Taluka Panchayat Samitis are invited for District Planning and Development Council meetings at the time of the sanction of the District Plans by the DPDCs. The Chairman of the Social Welfare Committee of the Zilla Parishad and also the Chairmen of Taluka Panchayat Samitis falling in the area of operation of the Tribal Area Sub-Plan are the members of the Special Executive Committee for Tribal Area Sub-Plan.

17.6. As a preliminary to introducing district level planning the plan schemes in the Fifth Five Year Plan of the State Government were classified into (i) State level and (ii) District level schemes. The intention was to devolve upon the DPDCs about 60 per cent of the plan outlay of the State Government. With this in view, major irrigation and Package Scheme of Incentives for industries were classified as District level schemes. But, later in 1976-77, on practical considerations, these were reclassified as State level schemes. This brought down the proportion of district level schemes in the State's Plan to only about 40 per cent.

17.7. Over the years, it became clear that, of the schemes classified as District level schemes, the planning and funding of certain schemes has to be done at the State level. This happens when new plan schemes are introduced, or when centrally sponsored schemes are adopted on a sharing basis, or schemes for local benefits require funds larger than could be provided within the District allocations. Hence, each year, the outlays required for all such schemes are taken out of the purview of the DPDCs and constituted into what is called "State Level Pool Schemes" though the schemes continue to be classified as District level schemes. For instance in 1983-84, out of the total District Plan allocation of Rs. 646.65 crore, State Pool Schemes amounted to Rs. 190.75 crore, i.e., 29.5 per cent of the total entitlement of the District Level Schemes. As a consequence, the plan funds actually devolved upon the DPDCs were further reduced to only about 30 to 32 per cent of the State Plan expenditure.

17.8. In 1973, while formulating the Fifth Plan of the State Government, a formula was evolved for allocation of funds to the districts for planning at the district level. Subsequently, in 1975, this was slightly modified. In the following we give the original formula and, side by side, the revised formula:

(1)	Percentage Weights	
	Original formula (2)	Revised formula (3)
1. Population	60	60
2. Backward Class Population (SC/ST/Nav-Baudhas)	5	5
3. Urban Population	5	5
4. Agricultural Backwardness	5	5
5. Communications Backwardness	5	5
6. Irrigation Backwardness	5	4
7. Industrial Backwardness	5	5
8. Coastal Districts	1.5	1.5
9. Drought-prone Areas	2	3
10. Forest Areas	1.5	1.5
11. Reserved at the State level for Special Problems	5	5
	100	100

In the above, Agricultural Backwardness is measured by the geometric mean of value added from agriculture per hectare and per agricultural worker; and backwardness in communications is measured by the geometric mean of road and rail mileage per 100 sq. km. and per lakh of population.

17.9. Experience has shown that about 40 per cent of the State's Plan Outlays are spent on district level schemes. Therefore, 40 per cent allocations out of the State's Annual Plan Outlays are set aside for district level schemes. Out of this, the amount required for State Pool Schemes is deducted and only the balance is distributed among the districts as per the formula mentioned above.

17.10. The total Annual Plan Outlay to be distributed among the districts according to the formula is divided into the 11 components as shown above in proportion to their respective weights and each component is distributed among the districts in proportion to the respective factor or indicator. Thus 60 per cent of the Plan Outlays to be distributed is allocated to the districts in proportion to their total population; 5 per cent is allocated in proportion to the SC/ST/Nav-Boudha population; 5 per cent in proportion to the urban population, etc. As all the factors, except population and urban population, are indicators of backwardness, the relatively underdeveloped districts get a somewhat larger allocation than they would if allocations were made entirely on the basis of population.

17.11. The outlays on the State Pool Schemes are distributed between districts as required by each particular scheme and not by any formula. In consequence, some districts get a larger share and some a smaller share than they would if even the outlays, on the State Pool Schemes were distributed according to the above formula. This is partially corrected as follows: While calculating the ceilings for the districts, the actual expenditure in the districts on all District Level Schemes including State Pool Schemes in the previous year is taken into account. Based on the actual expenditure, " deemed allocations " are worked out and any amount spent in excess is taken into consideration while working out the ceilings for the subsequent year. It may be noted that only 30 per cent of the excess expenditure or shortage is adjusted while calculating the ceilings. Thus, the adjustment corrects only partially the deviations from formula in district allocations caused by the State Pool Schemes.

17.12. After the ceilings for the Annual Plans are communicated to the districts, they are free to prepare the District Annual Plans and suggest schemes they desire to incorporate in the District Plan. However, while doing so, they have to take into account the guidelines issued by the State Government for preparation of schemes under the several sectors. This is unavoidable because even the State Government has to abide by the guidelines given by the Government of India in this respect. The State Government has to prepare its Annual Plan within the framework prescribed by the Government of India and, therefore, cannot give full liberty to the districts in preparing their Annual Plans. Hence, the DPDCs are required to prepare the Draft District Plans within the ceilings communicated fey the State Government, following general guidelines issued by Planning Department as also sectoral guidelines given by respective Administrative Departments. Discussions with the DPDCs are expected to be held at the State level for finalisation of District Plans. Then the District Plans are dovetailed in the State Plan. Unfortunately, we understand, for various reasons, the procedure has not worked effectively in the past four years, 1980-81 to 1983-84. It was revived recently while preparing the Annual Plan for 1984-85.

17.13. The DPDCs have authority to reallocate plan funds as a result of monthly monitoring of development programmes. For this purpose, the DPDCs are given powers of reappropriation of savings in the budgetted outlays for the district level schemes, and it is incumbent on the District Officers that they would give effect to such decisions of the DPDC through the formulation of Revised Estimates as required by the Budget Manual. This ensures that funds meant for a district are utilised within the district. These reappropriations require formal sanction of the Government. Experience shows that over 90% of

the proposals are approved by the Government without change. The powers of the DPDCs to review, monitor and reappropriate are regarded important features of district planning in Maharashtra.

17.14. Broadly within this framework of Planning in the State, we shall now consider how a process for removing the present backlog in the districts lagging behind may be initiated and suggest a. financial mechanism for the same.

Coverage of Sectors/Sub-sectors/etc., Examined:

17.15. It will be recalled that we have selected a number of sectors/ sub-sectors/ schemes/ programmes to examine the regional disparities in development and have assessed the corresponding backlogs of the districts lagging behind. To initiate a process for removing the backlog in the several sectors/ sub-sectors/ schemes/ programmes, we must draw upon plan funds or, more specifically approved outlays on the corresponding Plan Schemes. Hoping our proposals will be given effect at the earliest, we shall illustrate them with reference to the Annual Plan 1983-84.

17.16. In Annexure B [not included here] we give a list of the Plan Schemes relevant to the removal of backlog in each of the several sectors/ sub-sectors/ schemes/ programmes examined by us. Against each is shown the approved outlay for the Sixth Five Year Plan (1980-85) and the Annual Plan 1983-84. In Table 17.1 the schemewise outlays in the Annual Plan 1983-84 are classified into three categories : (a) State Level Schemes, (b) Distrist Level Schemes in the State Pool, and (c) Other District Level Schemes. In the following, we summarise the position in relation to the Annual Plan 1983-84:

Annual Plan 1983-84: Approved Outlay

(Rs. in Lakh)

	All Schemes	Schemes examined by us
State Level Schemes	85,334.78	25,381.38
District Level Schemes in the State Pool	19,075.00	6,373.50
Other District Level Schemes	45,590.22	28,931.69
Total	150,000.00	60,686.57

17.17. We may note that the Maharashtra State Electricity Board finances a substantial portion of its rural electrification and energisation of agricultural pump-sets programme from resources outside the Plan, almost as large as the resources within the Plan. These are naturally not shown above in the Plan outlays. But, our comments in the following apply equally to them.

State Pool for Removal of Specific Backlog:

17.18. We suggest that the Approved Outlay on the Schemes examined by us and hence relevant to removal of the specific backlog should be constituted into what we may call the "State Pool for Removal of Specific Backloga." The approved outlay for the Annual Plan 1983-84 is then broken up as under :

	Annual Plan 1983-84 Approved Outlay: Rs. in lakh
State Pool for Removal of Specific Backlog	60,686.57
Balance of State Level Schemes	59,953.40
Balance of State Pool of District Level Schemes	12,701.50
Balance of other Distrist Level Schemes	16,658.53
Total	150,000.00

Table 17.1. Approved Outlays in Annual Plan 1983-84 Relevant to Schemes Examined for Removal of Backlog

(Rs. in Lakh)

Sub-Sectors/items Relevant to Backlog (1)	On State Level Schemes (2)	On State Level Pool Schemes (3)	On District Level Schemes (4)	Total (5)
1. Road Development	1,482.00	549.50	3,297.50	5,329.00
2. Minor Irrigation (State and Local Sectors)	..	..	3,550.00	3,550.00
3. Medium Irrigation and Flood Control	..	2,109.00	3,684.30	5,793.30
4. Major Irrigation	22,731.00	..	..	22,731.00
5. Rural Electrifiction	..	1,368.00	2,932.00	4,300.00
6. Primary Education	..	..	557.78	557.78
7. Secondary Education	..	..	1,507.01	1,507.01
8. Pre-University and University Education	..	..	404.00	404.00
9. Adult Education				
10. Industrial Training Institutes	..	..	96.40	96.40
11. Technical High Schools/Centres	..	..	285.27	285.27
12. Technical Training in Higher Secondary School	..	..	64.00	64.00
13. Vocational Courses (+ 2 Stage)	..	..	7.00	7.00
14. Polytechnics	179.42	..	91.75	91.75
15. Primary Health Sub-Centres	..	..	..	179.42
16. Primary Health Centres	..	..	214.18	214.18
17. Rural Hospitals/Cottage Hospitals	..	..	658.69	658.69
18. Hospital Beds	..	..	372.88	372.88
19. Water Supply (excluding Corporation areas)	..	2,347.00	209.28	209.28
20. CADA Works	988.98	..	6,594.00	8,941.00
21. Land Development under Irrigation Projects in non-CADA areas.	..	..	..	988.96
22. Contour Bunding			799.82	799.82
23. Terracing	..	..	713.71	713.71
24. Nala Bunding	..	..	456.94	456.94
25. Land Development-cum-Horticultural	..	..	1,935.97	1,935.97
26. Animal Husbandry	..	..	238.73	238.73
Total	..	..	260.48	260.48
	25,381.38	6,373.50	28,931.69	60,686.57

17.19. The expenditure of the approved outlay on the Balance of State Level Schemes (Rs. 59,953.40 lakh) may remain at the discretion of the State Government as at present. The same should apply to the Balance of the State Pool of the District Level Schemes (Rs. 12,701.50 lakh). Regarding the Balance of District Level Schemes (Rs. 16,658.53 lakh), we suggest that the allocation of the approved outlay to different districts may be done according to the present formula slightly modified. In the following, we show the percentage weights to different factors assigned in the present formula and the modification we suggest:

		Percentage Weights	
		Present formula	Modified formula
1.	Population	60	70
2.	Backward Class population (SC/ST/Nav-Budhas)	5	5
3.	Urban Population	5	5
4.	Agricultural Backwardness	5	5
5.	Communications Backwardness	5	-
6.	Irrigation Backwardness	4	-
7.	Industrial Backwardness	5	5
8.	Coastal Districts	1.5	1.5
9.	Drought-prone Areas	3	3
10.	Forest Areas	1.5	1.5
11.	Reserved at the State level for special problems	5	4
		100	100

It will be noticed that the main change in the weights we are suggesting is to take out the weights given to (5) Communications Backwardness, and (6) Irrigation Backwardness because, as will be presently clear, we shall be making large provisions in the State Pool for Removal of Specific Backlog for removing the backlog in these two subjects. Having made such specific provisions, we think it would be appropriate to remove the weights given to these two factors and add the same to population. We have also reduced slightly the amount reserved at the State level for special problems, and added the equivalent (1 per cent) to the factor of Population.

17.20. Let us finally consider the allocation of the State Pool for Removal of Specific Backlog. We may clarify that though this is called State Pool, the several specific sectors / sub-sectors / schemes / programmes, the approved outlay on which is brought into this Pool, shall be kept separate as are presently the District Level Schemes in the State Pool. In other words, the approved outlay on each specific sector / sub-sector / scheme / programme shall be spent only on the same sector / etc., for which it is approved in the Plan. We are concerned only with its allocation between districts.

Certain Necessary Provisions:

17.21. As was indicated in Chapter III explaining our Approach to this problem, if the specific backlog is to be removed or reduced as rapidly as possible within the limits of available-funds, the entire approved outlay on the specific sector/sub-sector/scheme/programme, subject to certain qualifications, must be expended in the districts which have a backlog in the corresponding subject. The qualification arises from the need to make some provision for (a) completing certain on-going works/projects not relevant to removal of specific backlog, and (b)

meeting the needs of natural growth. We presume that the on-going works/projects in the backlog districts, areas or, in general, on-going works/projects completion of which will help removal of specific backlog will naturally receive priority. However some provision will be needed for completing some of the on-going works/projects not so relevant to removal of the specific backlog. Among the specific sectors/etc, covered by us, Roads and Irrigation have a large number of on-going works many of which would be located in the non-backlog districts/areas or would not be otherwise relevant to removal of the specific backlog. The situation presents a dilemma. On the one hand' if one takes the otherwise reasonable view that the on-going or incomplete works should first be completed before undertaking any new ones, the process of reducing the present backlog in the lagging districts may in many cases be postponed by several years and the completing of the on-going -works first may in fact enhance the present disparities. On the other hand, if one takes the otherwise necessary view that no more development in the non-backlog districts should be allowed until the present backlog in the districts lagging behind is removed, all the expenditure already incurred on some of the on-going works may be wasted.

17.22. Hence, one must take a balanced view of the situation. Though some provision has to be made for completing the on-going works, one must of necessity be highly selective in deciding which on-going works to complete and in which order. In general, the choice will have to be made on the basis of the stage at which a given work remains incomplete. A scrutiny of the on-going works will show that in many cases no more than a token beginning has been made. These should be sorted out and all such works not relevant to removal of specific backlog should be declared postponed for the duration of the Seventh Plan so that their claim as on-going works is not pressed

in each successive Annual Plan. On the other hand, in some cases, work would have progressed too far for its completion to be postponed. These may be completed within the small provision that we can make. The Government may decide, on some objective considerations, the districts in which these works may be taken up in successive Annual Plans.

17.23. 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.

17.24. On a balance of considerations, we suggest that 15 per cent of the State Pool for Removal of Specific Backlog, scheme by scheme, should be reserved at the State level for (a) completing some of the on-going works/projects not relevant to removal of specific backlog, and (b) to meet the needs of natural growth. The Government may decide, on the basis of some objective considerations, the division of the total amount so reserved between the two purposes (a) and (b) as also the districts in which the on-going works/projects may be taken up in each Annual

Plan within the provisions made under (a). As to the amount reserved for (b), namely meeting the needs of natural growth, we suggest that it should be distributed among all the districts, with and without a backlog, in proportion to their population, because, obviously, all districts, with or without a backlog, need some provision to meet the needs of natural growth.

17.25. In the above, we have suggested that 15 per cent of the State Pool for Removal of Specific Backlog may be reserved for (a) completion of some of the on-going works in the non-backlog districts, and (b) to meet the needs of natural growth. We wish to emphasise that this should be considered the maximum allowable on this account. Any larger diversion of funds from the State Pool for Removal of Specific Backlog will seriously retard the process of removing or reducing the present backlog.

Backlog in Relation to Resources:

17.26. The remaining 85 per cent of the State Pool for Removal of Specific Backlog will be available for removal of the specific backlog. It will be useful to judge its size in relation to the size of the backlog because on that will depend how long it will take to remove the present backlog. For this purpose, it will be useful to compare the size of the backlog with the outlays in a Five Year Plan, such as the Sixth Plan or the Seventh Plan rather than in an Annual Plan such as of 1983-84. With this in view, we bring together, in Table 17.2, the sectors/sub-sectors/ schemes/programmes which we have examined to assess the backlog. In Col. 2 of the Table, we give the aggregate backlog in each sector/sub-sector/etc. It will be remembered that, in a number of sectors/etc, the backlog was worked out separately in terms of the capital and recurring expenditure. Because the financial provision for removing the backlog will have to be made as part

of Plan Outlays, we have followed the customary practice and provided for, besides capital expenditure, recurring expenditure for a period of three years. Hence, the aggregate backlog in each sector/sub-sector/etc, shown in Col. 2 consists of backlog assessed in terms of capital expenditure plus three times the backlog assessed in terms of the recurring expenditure.

Table 17.2. Cost of Backlog Compared to Anticipated Outlays in Seventh Plan

(Rs. in Lakh)

Sector / Sub-sector Scheme / programme (1)	Aggregate Backlog (2)	Sixth Five Year Plan Approved Outlays (3)	Expenditure During 1980-85 (4)	Seventh Five Year Plan Estimated Outlays (5)	Estimated Cost of Backlog in Seventh Plan (6)	Col. (5) as Percentage of Col. (6) (7)
1. Main Roads	27,979.00	13,500.00	15,751.18	39,377.95	41,968.50	79.75
2. Other Roads	32,050.00	9,800.00	8,466.27	21,165.67	48,075.00	37.42
3. Irrigation	138,592.00	122,677.00	134,234.35	335,585.87	207,888.00	137.21
4. Rural Electrification	5,490.00	16,000.00	19,281.00	48,202.00	8,235.00	497.53
5. Energisation of Pump Sets	18,575.05	16,000.00	18,576.00	46,440.00	27,802.58	141.67
6. Primary Education	3,855.90	1,580.94	1,899.25	4,748.12	5,783.85	69.78
7. Secondary Education	3,109.95	4,887.15	6,597.72	16,494.30	4,664.93	300.54
8. Pre-University and University Education	2,037.60	997.70	1,655.10	4,137.75	3,056.40	115.07
9. Adult Education	151.11	445.42	441.57	1,103.92	22,667.00	413.96
10. Industrial Training Institutes	3,931.58	675.00	1,520.50	3,801.25	5,897.37	54.79
11. Technical High School/ Centres	1,025.20	233.00	364.27	910.67	1,537.80	50.34
12. Technical Training in Higher Secondary Schools	33.69	25.00	491.58	1,228.95	50.54	2,066.90
13. Vocational Courses	19.56	300.00	654.60	1,636.50	29.34	4,741.07
14. Polytechnics	3,329.80	646.00	779.66	1,949.15	4,994.70	33.17
15. Primary Health Sub-Centres	408.00	630.00	411.55	1,028.87	612.00	142.90
16. Primary Health Centres	..	944.00	2,308.79	5,771.97	..	..
17. Rural Cottage Hospitals	3,422.00	831.00	1,109.88	2,774.70	5,149.50	45.80
18. Hospital Beds	18,291.00	670.00	816.60	2,041.50	27,436.50	6.32
19. Water Supply by Dug/ Bore Wells	1,132.87	6,100.00	11,876.37	29,690.93	1,699.31	1,485.15
20. Piped Water Supply to Problem Villages	8,016.60	20,900.00	15,764.50	39,411.25	12,024.90	278.58
21. Piped Water Supply to Other Villages	..	..	..	..	..	..
22. Urban Water Supply	28,675.40	4,951.00	9,632.80	24,082.00	43,012.00	47.59
23. CADA Works	8,229.40	3,470.25	1,000.00	2,500.00	12,344.10	17.21
24. Land Development in Non-CADA Areas	90.14	3,017.76	1,020.62	2,551.55	135.21	1,604.04
25. Contour -Bunding	4,379.50	3,349.82	454.49	1,136.23	6,569.25	14.70
26. Terracing	2,362.50	2,620.59	561.34	1,403.35	3,543.75	33.66
27. Nala Bunding	2,431.50	7,269.38	1,140.22	2,850.55	3,647.25	66.43
28. Land Development-cum- Horticultural Development	284.11	961.75	205.72	514.30	426.17	102.58
29. Veterinary Institutes	775.35	524.30	1,055.31	2,638.27	1,163.03	192.92

17.27. In Col. 3 of the Table, we show the approved outlays in the Sixth Five Year Plan (1980-85) on the respective sectors/ sub-sectors/ schemes/ programmes, In Col. 4 is shown the actual expenditure during the first four years of the Sixth Plan namely 1980-84 and the estimated expenditure during 1984-85 It may be noticed that the actual/estimated expenditure on some of the sectors/ sub-sectors/etc, during the Plan period 1980-85 deviates considerably from the outlays originally approved. In Col. 5, we give the estimated outlays in the Seventh Five Year Plan (1985-90). The Seventh Plan is still at an early stage of formulation. Hence, the estimated out-

lays shown in Col. 5 are necessarily speculative; in fact, we have taken them merely to be two-and-half times the actual estimated expenditure during the Sixth Plan. We should also revise the cost of the backlog shown in Col. 2 in order to take into account possible escalation in costs. Our estimates of costs of backlog are generally based on 1982-83 costs, in other words the average costs of the Sixth Plan period. We expect, again somewhat speculatively, that the average costs during the Seventh Plan period will be about 50 per cent higher. In Col. 6 of the Table, we show the costs of the backlog so escalated. We should emphasise that the estimated outlays in the Seventh Plan shown in Col. 5 and the escalated costs of the backlog shown, in Col. 6 are both essentially speculative. Our purpose here is mainly to illustrate the financial procedure we propose for removing the backlog. In Col. 7 of the Table, we show 85 per cent of the estimated outlay in the Seventh Plan as a percentage of the escalated cost of the backlog shown (Col. 6). It indicates what percentage of the backlog may be removed during the Seventh Plan period. The Government may bear in mind this circumstance while finalising the sectoral allocations in the Seventh Five Year Plan.

17.28. It will be seen that in some of the sectors/Sub-Sectors/schemes/programmes, the anticipated outlays in the Seventh Plan are more than the estimated cost of the backlog. These are : Irrigation, Electrification, Education except Primary Education, Technical Training in Higher Secondary Schools and Vocational Courses, Primary Health sub-centres, rural water supply. Land Development in Non-CADA areas, Land Development-cum-Horticultural Development, and Veterinary Institutes. In these cases, it seems the entire backlog may be removed within the Seventh Plan period. In the remaining sectors/etc, the present backlog cannot all be removed within the Seventh Plan period. These are : Roads, Primary Education, Industrial Training Institutes, Technical High Schools/Centres, Polytechnics, Rural Cottage Hospitals, Hospital Beds, Urban Water Supply, CADA Works, Contour Bunding, Terracing and Nala Bunding.

Allocation from State Pool for Removal of Backlog:

17.29. We may now ask now the 85 per cent of the outlays in the State Pool for Removal of specific Backlog may be distributed among the districts, scheme by scheme. We should distinguish the two situation mentioned above: (a) Sectors/sub-sector/etc., in which it may be possible not only to remove the present backlog but to choose a higher target and bring all districts up to it within the Seventh Plan period; and (b) Sectors/etc., where it will be possible to remove only a part of the present backlog. In the first case, the distribuion of the 85 per cent of the outlays in the State Pool for Removal of Specific Backlog, scheme by scheme, among districts is straightforward. It 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 the districts in the particular sector/sub-sector etc., should be reviewed.

17.30. We may now consider the second case namely of sectors/etc, where, during the period of the Seventh Plan, it will be possible to remove only a part of the backlog. In this situation the distribution of funds from the State Pool for Removal of Specific Backlog to different districts with a backlog presents at least two alternatives. The first alternative is as follows: Seeing that there are not enough funds to bring all the backlog districts to the present State average, we should so allocate the funds that, beginning with the most bottom district, as many of them as the resources

permit should be brought to as high a level as possible. The process may be explained as follows: Imagine all the districts arranged in descending order of the indicator under reference. Some of the districts will be found to lie above the State average and others below the State average. Those lying below the State average are the ones with a backlog. The plan funds are not adequate to bring them all to the State average and thus remove the present backlog. In the circumstance, we ask how much will it cost to raise the most bottom district, that is number one district from the bottom, to the level of the second district from the bottom. If the plan funds are more than needed for this purpose, we ask how much will it cost to raise the last two districts from the bottom to the level of the third district from the bottom. If the plan funds are more than needed even for this purpose, we ask what will it cost to raise the last three districts from the bottom to the level of the fourth district from the bottom; and so forth until the cost of raising as many districts from the bottom to the level of the next district from the bottom equals the available plan funds. Then, the funds from the State Pool for Removal of Specific Backlog will be allocated only to the districts so covered. In consequence, some districts with a backlog but lying above these districts will not get any allocation whatever. The allocation of funds when they are not adequate to remove the backlog of all the districts with a backlog are made on the principle of maximum justice to those left most behind.

17.31. The proposal has obviously a strong appeal of justice and, for that reason, we have given it much thought and consideration. 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 upto a point. We must distinguish, districts with and without a backlog, accelerate development in the districts with a backlog and slow it down in the 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.

17.32. Hence, we find the proposal to remove backlog step by step beginning at the bottom so that at each step the most bottom districts are all raised to a certain minimum level attainable within the given resources, not practicable and desirable. Instead, we propose that the process of removing the backlog should be spread over all the districts with a backlog. To this purpose, we suggest that the State Pool for the Removal of Specific Backlog should be allocated, each year, to all the districts with a backlog in proportion to their backlog. Thereby, the districts left far behind will receive larger funds in proportion to the quantum of their larger backlog but the other districts with a backlog will also receive some allocations in proportion to their smaller backlog. Subject to the essential requirement of the process of removal of backlog, the development will be spread as widely as possible, namely, in all the districts with a backlog and in proportion to the quantum of their backlog. In Annexure C [not included here], we illustrate the districtwise allocations of the State Pool for Removal of Specific Backlog for each sector/sub-sector/etc., we have examined. For purposes of illustration, we shall use the approved outlays in the Annual Plan 1983-84.

17.33. From the above, it would be clear that our procedure for allocation of funds from the State Pool for Removal of Specific Backlog requires: (a) Identification of approved outlays to specific relevant sectors/sub-sectors; schemes/programmes in the Annual Plan for each year; (b) Reserving 15 per cent of the funds for completion of on-going works in the non-backlog districts and for meeting the needs of natural growth in all districts, (c) Allocating the balance of 85 per cent of the funds to all districts with a backlog in proportion to their respective backlog measured from the present State average.

17.34. In the case of three schemes, namely, Vocational Courses, Rural Water Supply with dug/bore wells, and Land Development in Non-CADA area, the backlog is smaller than the respective outlays in the Annual Plan 1983-84. To keep our present illustration simple, we have adopted the following procedure in the three cases. (a) We combined the backlogs and the outlays for three schemes of Technical Training, Technical High Schools/ Centres, Technical Training in Higher Secondary Schools and Vocational Courses and distributed the combined outlay in proportion to the combined backlog; we combined all three, if we had combined only Technical Training in Higher Secondary Schools and Vocational Courses, the combined backlog would still be smaller than the combined outlay, (b) Similarly, we combined the two schemes of water supply to problem villages namely, water supply with dug/bore wells and piped water supply, and distributed the combined outlay in proportion to the combined backlog, (c) In the case of Land Development in Non-CADA areas, only Rs. 90.14 lakh are needed to complete all potential works while plan outlay amounts to Rs. 799.82 lakh. Hence we have distributed Rs. 90.14 lakh between districts in proportion to their backlog, that is residual work. The balance of the

amount should be added to the outlays on the district level schemes to be distributed according to the formula mentioned in para 17.19.

17.35. We wish to emphasize that these allocations must be treated as earmarked for removing the backlog in the specific sector/sub-sector/scheme/programme. It means that the DPDCs will not have the authority to reallocate these funds to any other purposes. On the other hand, the DPDCs should be given greater discretion to decide, in consultation with the concerned departments, as to how these funds may be spent so that the backlog may be removed effectively and expeditiously.

17.36. It will be noted that the backlog in each sector, etc., has been worked out on the basis of some indicator. It follows that whether and to what extent the backlog has been removed or reduced will have to be judged on the basis of the same indicator. Hence, given the funds allocated for removing the backlog in a specific sector, the DPDCs will prepare a detailed plan of action indicating its expected effect on the concerned indicator and, at the end of each year, shall evaluate the plan of action in terms of the same indicator.

Reducing Disparities-A Continuous Process:

17.37. 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 the backlog of districts should be reworked 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 the taluka level; and wherever necessary, other

and more relevant indicators may be chosen to assess the backlog. This should constitute the basis for continuing the process of reducing the disparities into the Eighth Five Year Plan. As we have emphasized, while explaining our Approach to this subject, what we propose to initiate is not a programme for removing a given backlog but a continuing 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.

17.38. We have been asked to suggest long term measures to prevent recurrence of regional disparities in development. The continuing process of reducing disparities in development, as we propose to initiate, will ensure that the existing disparities will not increase and, if new disparities arise, they will not go unnoticed and unacted upon. It has been suggested to us that it will be desirable to provide statutory guarantee that this process will continue unhindered and untampered with. We are inclined to agree.

Article 371 (2):

17.39. It has been emphatically represented to us that the invocation of the provisions of Article 371(2) of the Constitution will precisely serve this purpose of giving a statutory guarantee to the policy and process of removing regional disparities and that therefore we should strongly recommend the same. We have given this proposition all the careful consideration which it demands and deserves.

17.40. As already explained (para 2.6), Article 371 (2) of the Constitution empowers the President of India to provide for special responsibility of the Governor in respect of three matters, namely (a) the establishment of separate development boards for Vidarbha, Marathwada, and the rest of Maharashtra with the provision that a report on the working of each board will be placed every year before the State Legislative Assembly; (b) equitable allocation of funds for development expenditure over the three regions subject to the requirements of the State as a whole; and (c) equitable arrangements providing adequate facilities for technical education and vocational training, and adequate opportunities for employment in services under the control of the State Government, in respect of the three regions, subject to the requirements of the State as a whole.

17.41. We have already examined at length how funds for development expenditure may be allocated equitably between the three regions. In doing this, we have given to the concept of "equitable allocation" a specific and operationally meaningful content and, recognising that there are disparities in development even within the three regions, we have extended the concept to the districts and suggested that, wherever appropriate, it may be extended further to the talukas. In like manner, we have examined how equitable arrangements may be made to provide adequate facilities for technical education and vocational training in the three regions. Here again we have given the terms "equitable arrangements" and "adequate facilities" a specific and operationally meaningful content and extended the same to the districts. We have not examined how equitable arrangements may be made for providing adequate opportunities for employment in services under the control of the State Government. We shall consider it in the next Chapter [not included here].

17.42. Hence, if the Government will accept our recommendations in respect of (i) equitable allocation of funds for development expenditure, and (ii) equitable arrangements to provide adequate facilities for technical education and vocational training, we do not think it will be

necessary to make these matters a special responsibility of the Governor. Once the Government accepts the policy and the process recommended by us all that is needed is a statutory guarantee that these will be pursued unhindered and untampered with. It is in this context that we need examine the provisions under Article 371 (2) to establish separate development boards for Vidarbha, Marathwada and rest of Maharashtra.

17.43. Article 371 (2) does not specify the functions of the contemplated regional development boards except that the boards will report to the State Legislature every year. Naturally, we found great differences of opinion, even among those who advocated invoking the provisions of Article 371 (2), as to the scope, powers, and functions of the regional boards. As much as we can see, the regional development boards cannot have executive functions independent of the State Government; clearly, this would be contrary to the requirements and interests of the State as a whole. Hence, it seems to us that the regional development boards can have only watch-dog functions of overseeing the operation of the policy and process of reducing regional disparities in development and implementation of the related programmes, and making a report every year to the State Legislature.

Statutory Watch-Dog Authority:

17.44. We think it necessary and desirable to have a statutory watch-dog authority of this kind. In the nature of its functions, it is obvious that such an authority cannot be regional and must not be political. There has to be a single non-political, authority for the whole State. It should also not be a Committee or a Council. It should be a single person, non-political, quasi-judicial, single authority for the whole State. We recommend that a statutory watch-dog authority of this kind be established to oversee the process of reducing regional disparities in development and to report every year to the State Legislature.

17.45. We do not feel competent to spell out the detailed provisions of the necessary legislation. However, it seems to us that a legislation similar in scope and intention to the Maharashtra Lokayukta and Upa-Lokayukta Act, 1971, will be useful.

17.46. We invite attention to some of the provisions of the Lokayukta Act which appear relevant to our purpose.

Appointment:

The Governor shall, by warrant under his hand and seal appoint a person to be known as x x x provided x x x shall be appointed after consultation with the Chief Justice of the High Court and the Leader of the Opposition (Clause 3). We suggest that in the present case the appointment should be made by the Government in consultation with the Leader of the Opposition.

To hold no Office:

x x x shall not be a member of Parliament or a member of the Legislature of any State and shall not hold any office of trust or profit (other than his office) or be connected with any political party or carry on any business or practise any profession (Clause 4).

Term of Office:

x x x shall hold office for a term of five years from the date on which he enters upon his office (Clause 5).

Conditions of Service:

The allowances and pension payable to, and other conditions of service, of x x x shall be such as may be prescribed provided that regard shall be had to the allowances and pensions payable to and other conditions of service of, the Chief Justice of the High Court (Clause 5.5).

Removal:

Subject to the provisions of the Constitution, x x x may be removed from his office by the Governor on the ground of misbehaviour or incapacity, and on no other ground: Provided, etc.

Matters to be Investigated:

(Clause 7) In the present case, these will naturally be quite different. We suggest the following points: (a) Composition and content of the State Pool for Removal of Specific Backlog; (b) Its allocation each year to different districts; (c) Its expenditure during the year; (d) Net results achieved in reducing the backlog and disparities in terms of the indicators used; and (e) Any policies, plans, programmes, proposals, and acts of the State Government which may hinder, tamper with, neutralise, or otherwise defeat the process of reducing regional disparities.

Provisions relating to complaints:

A complaint may be made under this Act to x x x provided every complaint shall be made in such form and shall be accompanied by such affidavits as may be prescribed (Clause 9).

Evidence :

x x x may require any public servant or any other person who in his opinion is able to furnish information or produce documents relevant to the investigation to furnish any such information or produce such document (Clause 11)

Report (Clause 12). This may be substituted to say that x x x will submit his report every year to the Government and the Government shall present it to the State Legislature where there will be at least one day reserved for discussion.

Staff:

x x x may appoint officers and other employees to assist in the discharge of his functions; the categories of officers and employees who may be appointed their salaries, allowances, and other conditions of service and the administrative powers of x x x shall be such as may be prescribed after consultation with x x x. Without prejudice to the above provisions, x x x may, for the purpose of conducting investigations under this Act, utilise the services of any officer of the State Government.

17.47. To leave no doubt on this point, we should make clear that the proposed authority, whatever its name, shall not be an executive authority responsible for implementation of any programmes nor shall it have authority to restrain any officer, department, or agency of the Government or to prevent him from executing any programme whatsoever. The function of the proposed authority will be to investigate and evaluate ex post (i) composition and content of the State Pool for Removal of Specific Backlog, (ii) its allocation each year to different districts, (iii) its expenditure during the year, (iv) the net results achieved in reducing backlog and disparities in terms of specified indicators, (v) watch any policies, programmes, etc, of the Government which might defeat this process, and (vi) make an annual report to Government. His effectiveness

will depend upon the objectivity and thoroughness with which he makes his annual report to Government which shall be placed before the State Legislature. We believe that a publicly announced commitment of the State Government to a policy and programme of reducing regional disparities such as recommended by us, an independent authority to report annually on its implementation, and a public debate on his report, both inside and outside the State Legislature, provide a more effective mechanism to oversee the process of reducing regional disparities and to prevent their recurrence, consistent with the requirements and interests of the State as a whole, than the regional development boards contemplated in Article 371 (2). As already mentioned, we have not so far examined what provisions can be made to ensure adequate representation to different regions in services under the control of the State Government. Such provisions, if considered essential, may require invoking the provisions of Article 371 (2). We shall examine the question in the next Chapter.

Annexure A. Cost of Backlog of Roads, Irrigation and Electrification

(Rs. in Lakh)

District	Main Roads	Other Roads	Irrigation	Village Electrification	Energising Agricultural Pump sets	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Greater Bombay	..	..	..	..	..	..
2. Thane	2,045.00	..	4,108.00	351.00	294.45	6,798.45
3. Raigad	597.00	1,280.00	..	331.20	629.98	2,838.18
4. Ratnagiri	3,038.00	420.00	6,450.00	273.60	1,096.42	11,278.02
Konkan (Excl. G.B.)	5,680.00	1,700.00	10,558.00	955.80	2,020.85	20,914.65
5. Nashik	681.00	2,070.00	4,815.00	219.60	..	7,785.60
6. Dhule	900.00	..	4,223.00	376.20	..	5,499.20
7. Jalgaon	946.00	..	3,181.00	..	..	4,127.00
8. Ahmednagar	879.00	..	7,549.00	..	..	8,428.00
9. Pune	1,549.00	2,670.00	5,639.00	225.00	361.01	10,444.01
10. Satara	1,013.00	..	2,259.00	..	415.09	3,687.09
11. Sangli	304.00	..	5,991.00	..	..	6,295.00
12. Solapur	926.00	..	9,975.00	..	1,415.31	12,316.31
13. Kolhapur	586.00	..	..	..	..	586.00
Western Maharashtra	7,784.00	4,740.00	43,632.00	820.80	2,191.41	59,168.21
14. Aurangabad	1,817.00	..	7,569.00	..	..	9,386.00
15. Parbhani	1,935.00	4,590.00	..	90.00	2,844.40	9,459.40
16. Beed	1,181.00	..	10,437.00	..	1,659.45	13,277.45
17. Nanded	699.00	300.00	..	331.20	1,219.53	2,549.73
18. Osmanabad	460.00	..	13,665.00	..	1,101.88	15,266.88
Marathwada	6,092.00	4,890.00	31,671.00	421.20	6,825.26	49,899.46
19. Buldhana	479.00	880.00	8,478.00	104.40	..	9,941.40
20. Akola	624.00	1,440.00	9,235.00	196.20	1,377.22	12,872.42
21. Amravati	1,292.00	1,900.00	13,433.00	153.00	..	16,778.00
22. Yavatmal	1,376.00	2,770.00	10,541.00	68.40	1,392.69	16,148.09
23. Wardha	889.00	770.00	4,389.00	50.40	..	6,098.40
24. Nagpur	431.00	3,430.00	1,165.00	99.00	..	5,125.00
25. Bhandara	222.00	..	..	385.20	1,561.17	2,168.37
26. Chandrapur	3,110.00	9,530.00	5,490.00	2,235.60	3,206.45	23,572.05
Vidarbha	8,423.00	20,720.00	52,731.00	3,292.20	7,537.53	92,703.73
Maharashtra State	27,979.00	32,050.00	138,592.00	5,490.00	18,575.05	222,686.05
Maharashtra State (Excl. G.B)	27,979.00	32,050.00	138,592.00	5,490.00	18,575.05	222,686.05

(Contd.)

Annexure A. *(Contd.)*
Cost of Backlog in General Education

(Rs. in Lakh)

District	Primary Education	Secondary Education	Pre-University And University Education	Adult Education	Total
(1)	(8)	(9)	(10)	(11)	(12)
1. Greater Bombay	..	..	..	..	..
2. Thane	721.50	257.40	192.60	17.70	1,189.20
3. Raigad	..	63.00	234.90	..	297.90
4. Ratnagiri	..	..	288.00	..	288.00
Konkan (Excl. G.B.)	**721.50**	**320.40**	**715.50**	**17.70**	**1,775.10**
5. Nashik	..	..	..	32.40	32.40
6. Dhule	126.90	55.35	63.90	..	246.15
7. Jalgaon	..	..	..	..	..
8. Ahmednagar	..	..	..	17.64	17.64
9. Pune	63.60	..	..	..	63.60
10. Satara	..	..	..	..	..
11. Sangli	..	..	..	15.00	15.00
12. Solapur	..	334.35	5.40	17.79	357.54
13. Kolhapur	..	109.80	..	..	109.80
Western Maharashtra	**190.5**	**499.50**	**69.30**	**82.83**	**842.13**
14. Aurangabad	279.60	329.85	..	0.75	610.20
15. Parbhani	745.20	483.30	263.70	11.49	1,503.69
16. Beed	375.00	225.00	0.90	..	600.90
17. Nanded	414.60	241.20	..	..	655.80
18. Osmanabad	45.00	..	..	..	45.00
Marathwada	**1,859.40**	**1,279.35**	**264.60**	**12.24**	**3,415.59**
19. Buldhana	84.60	111.15	215.10	..	410.85
20. Akola	36.90	..	108.90	..	145.80
21. Amravati	..	..	..	..	..
22. Yavatmal	39.00	299.25	162.00	14.04	514.29
23. Wardha	..	..	34.20	..	34.20
24. Nagpur	410.10	..	..	24.30	434.40
25. Bhandara	245.70	132.30	260.10	..	638.10
26. Chandrapur	268.20	468.00	207.90	..	944.10
Vidarbha	**1,084.50**	**1,010.70**	**988.20**	**38.34**	**3,121.74**
Maharashtra State	**3,855.90**	**3,109.95**	**2,037.60**	**151.11**	**9,154.56**
Maharashtra State (Excluding G. B.)	**3,855.90**	**3,109.95**	**2,037.60**	**151.11**	**9,154.56**

Annexure A. *(Contd.)*
Cost of Backlog in Technical Education

(Rs. in Lakh)

District	Industrial Training Institutes	Technical Highschools/ Centers	Technical Training in Higher Secondary Schools	Vocational Courses	Polytechnics	Total
(1)	(13)	(14)	(15)	(16)	(17)	(18)
1. Greater Bombay	970.55	..	..	..	..	970.55
2. Thane	86.00	..	3.18	2.49	236.00	327.67
3. Raigad	..	58.57	2.22	..	237.80	298.59
4. Ratnagiri	..	40.32	2.28	..	266.80	309.40
Konkan (Excl. G.B.)	86.00	98.89	7.68	2.49	740.60	935.66
5. Nashik	84.50	91.94	1.56	..	141.60	319.60
6. Dhule	106.80	..	2.16	2.34	3.60	114.90
7. Jalgaon	239.89	..	..	2.34	3.60	245.83
8. Ahmednagar	276.12	61.04	1.35	2.22	216.00	556.73
9. Pune	371.95	..	..	1.41	..	373.36
10. Satara	..	..	..	1.89	3.60	5.49
11. Sangli	..	..	..	1.65	212.40	214.05
12. Solapur	322.73	..	..	0.30	..	323.03
13. Kolhapur	..	..	..	..	..	..
Western Maharashtra	1,401.99	152.98	5.07	12.15	580.80	2,152.99
14. Aurangabad	64.31	79.06	0.21	..	239.60	383.18
15. Parbhani	251.93	48.82	3.06	1.20	180.60	485.61
16. Beed	77.29	..	0.78	1.02	180.60	259.69
17. Nanded	122.91	61.83	1.35	..	74.40	260.49
18. Osmanabad	254.22	40.88	1.14	..	253.20	549.44
Marathwada	770.66	230.59	6.54	2.22	928.40	1,938.41
19. Buldhana	38.94	60.58	2.25	1.05	3.60	106.42
20. Akola	149.44	95.66	1.59	..	141.60	388.29
21. Amravati	79.50	132.26	3.12	..	..	214.88
22. Yavatmal	171.10	80.87	2.82	..	74.40	329.19
23. Wardha	..	..	..	..	212.40	212.40
24. Nagpur	80.50	54.88	2.28	..	35.40	173.06
25. Bhandara	49.56	36.07	1.62	1.65	180.60	269.50
26. Chandrapur	133.34	82.42	0.72	..	432.00	648.48
Vidarbha	702.38	542.74	14.40	2.70	1,080.00	2,342.22
Maharashtra State	3,931.58	1,025.20	33.69	19.56	3,329.80	8,339.83
Maharashtra State (Excl. G.B.)	2,961.03	1,025.20	33.69	19.56	3,329.80	7,369.28

(Contd.)

Annexure A. *(Contd.)*
Cost of Backlog of Health Services and Water Supply

(Rs. in Lakh)

District	Primary Health Sub-Centers	Rural / Cottage Hospitals	Hospital Beds	Water Supply to Problem Villages	Piped Water Supply to Problem Villages	Urban Water Supply	Total
(1)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
1. Greater Bombay	..	..	..	..	..	..	..
2. Thane	44.80	116.00	..	237.60	84.02	160.00	642.42
3. Raigad	91.20	58.00	300.30	121.83	99.07	370.00	1,040.40
4. Ratnagiri	57.60	58.00	606.90	386.10	1,163.19	480.00	2,751.79
Konkan (Excl. G.B.)	193.60	232.00	907.20	745.53	1,346.28	1,010.00	4,434.61
5. Nashik	11.20	232.00	806.40	..	128.52	2,248.00	3,426.12
6. Dhule	32.00	232.00	1,388.10	..	234.01	2,080.00	3,966.11
7. Jalgaon	..	174.00	1,898.40	..	581.94	3,126.40	5,780.74
6. Ahmednagar	33.60	348.00	714.00	170.10	72.90	340.00	1,678.60
9. Pune	..	116.00	..	39.68	226.81	320.00	702.49
10. Satara	20.80	58.00	749.70	58.24	..	502.00	1,388.74
11. Sangli	3.20	58.00	..	..	..	250.00	311.20
12. Solapur	..	116.00	..	76.16	54.07	850.00	1,096.23
13. Kolhapur	27.20	116.00	1,484.76	23.76	..	292.00	1,943.66
Western Maharashtra	128.00	1,450.00	7,041.30	367.94	1,298.25	10,008.40	20,293.89
14. Aurangabad	27.20	58.00	426.30	..	11.92	2,170.00	2,693.42
15. Parbhani	..	174.00	1,850.10	..	581.63	1,554.00	4,159.73
16. Beed	..	116.00	646.80	..	18.10	610.00	1,390.90
17. Nanded	..	116.00	1,281.00	..	268.69	794.00	2,459.69
18. Osmanabad	11.20	174.00	2,366.70	..	47.05	1,600.00	4,198.95
Marathwada	38.40	638.00	6,570.90	..	927.39	6,728.00	14,902.69
19. Buldhana	6.40	58.00	976.50	..	273.29	1,250.00	2,564.19
20. Akola	1.60	116.00	71.40	..	1,284.44	2,260.00	3,733.44
21. Amravati	..	116.00	..	..	590.59	2,440.00	3,146.59
21. Yavatmal	27.20	116.00	678.30	..	124.23	1,040.00	1,985.73
23. Wardha	..	..	69.30	19.40	249.39	872.40	1,210.49
24. Nagpur	6.40	58.00	..	..	471.74	996.80	1,532.94
25. Bhandara	6.40	174.00	997.50	..	598.05	1,040.00	2,815.95
26. Chandrapur	..	464.00	978.60	..	852.95	1,028.80	3,324.35
Vidarbha	48.00	1,102.00	3,771.60	19.40	4,444.68	10,928.00	20,313.68
Maharashtra State	408.00	3,422.00	18,291.00	1,132.87	8,016.60	28,674.40	59,944.87
Maharashtra State (Excl. G.B.)	408.00	3,422.00	18,291.00	1,132.87	8,016.60	28,674.40	59,944.87

Annexure A. *(Contd.)*
Cost of Backlog in Land Development, Soil Conservation

(Rs. in Lakh)

District	Land Development Work		Contour Bunding	Terracing	Nala Bunding
	by CADA	in non-CADA Areas			
(1)	(26)	(27)	(28)	(29)	(30)
1. Greater Bombay	..	..	..	..	..
2. Thane	..	2.78	..	..	47.50
3. Raigad	..	..	..	..	..
4. Ratnagiri	..	..	..	1,350.00	..
Konkan (Excel. G.B.)	**..**	**2.78**	**..**	**1,350.00**	**47.50**
5. Nashik	..	..	..	..	..
6. Dhule	28.20	..	..	..	..
7. Jalgaon	..	..	171.00	..	..
8. Ahmednagar	..	11.65	..	..	..
9. Pune	787.60	12.40	..	..	..
10. Satara	55.60	..	648.00	112.50	..
11. Sangli	1,048.20	..	..	..	..
12. Solapur	1,979.20	7.94	..	..	..
13. Kolhapur	563.20	..	..	..	60.00
Western Maharashtra	**4,462.00**	**31.99**	**819.00**	**112.50**	**60.00**
14. Aurangabad	..	..	..	..	195.00
15. Parbhani	901.20	3.77	715.50	..	179.00
16. Beed	..	0.48	36.00	..	202.50
17. Nanded	1,731.20	..	40.50	..	199.00
18. Osmanabad	..	..	..	..	426.00
Marathwada	**2,632.40**	**4.25**	**792.00**	**..**	**1,201.50**
19. Buldhana	..	6.32	..	..	223.00
20. Akola	..	..	887.50	..	117.50
21. Amravati	..	..	292.50	..	125.50
22. Yavatmal	178.80	18.56	360.00	..	183.50
23. Wardha	..	..	364.50	..	241.00
24. Nagpur	956.20	4.36	18.00	..	232.00
25. Bhandara	..	0.35	..	..	..
26. Chandrapur	..	21.53	846.00	900.00	..
Vidarbha	**1,135.00**	**51.12**	**2,768.50**	**900.00**	**1,122.50**
Maharashtra State	**8,229.40**	**90.14**	**4,379.50**	**2,362.50**	**2,431.50**
Maharashtra State (Excl. G.B.)	**8,229.40**	**90.14**	**4,379.50**	**2,362.50**	**2,431.50**

(Contd.)

Annexure A. *(Concld.)*
Cost of Backlog in Land Development, Soil Conservation and Veterinary Institutes

(Rs. in Lakh)

District	Land Development-cum-Harticultural Development	Total Land Development and Soil Conservation	Veterinary Institutes	Grand Total of all Schemes
(1)	(31)	(32)	(33)	(34)
1. Greater Bombay	..	..	..	970.55
2. Thane	18.39	68.67	18.30	9,044.71
3. Raigad	43.92	43.92	3.00	4,521.99
4. Ratnagiri	..	1,350.00	18.00	15,995.21
Konkan (Excl. G.B.)	63.31	1,462.59	39.30	29,561.91
5. Nashik	..	..	9.00	11,572.72
6. Dhule	..	28.20	6.00	9,860.56
7. Jalgaon	..	171.00	39.45	10,364.02
8. Ahmednagar	..	11.65	96.30	10,788.92
9. Pune	..	800.00	12.00	12,395.46
10. Satara	..	816.10	3.00	5,900.42
11. Sangli	..	1,048.20	24.00	7,907.45
12. Solapur	..	1,987.14	53.25	16,133.50
13. Kolhapur	219.39	842.59	..	3,482.05
Western Maharashtra	219.39	5,704.88	243.00	88,405.10
14. Aurangabad	..	195.00	21.00	13,288.80
15. Parbhani	..	1,799.47	75.60	17,483.50
16. Beed	1.24	240.22	39.75	15,808.91
17. Nanded	..	1,970.70	122.55	8,018.96
18. Osmanabad	..	426.00	39.30	20,485.57
Marathwada	1.24	4,631.39	298.20	75,085.74
19. Buldhana	..	229.32	..	13,252.18
20. Akola	..	1,005.00	6.60	18,151.55
21. Amravati	1.17	419.17	..	20,558.64
22. Yavatmal	..	740.86	48.75	19,766.91
23. Wardha	..	605.50	6.00	8,166.99
24. Nagpur	..	1,210.56	..	8,475.96
25. Bhandara	..	0.35	..	5,892.27
26. Chandrapur	..	1,767.53	133.50	30,390.01
Vidarbha	1.17	5,978.29	194.85	124,654.51
Maharashtra State	284.11	17,777.15	775.35	318,677.81
Maharashtra State (Excluding G.B.)	284.11	17,777.15	775.35	317,707.26

APPENDIX A

Note of Dissent
by Shri B.A. Kulkarni

While I am in broad agreement with the Committee's approach and findings and while I do have a gre a personal regard to all the members of the Committee and specially to its Chairman, Dr. V.M. Dandekar, I feel \ my duty to record a note of dissent on the few points on which I could not agree with the views expressed in their Committee's report.

1. *Abrogation of Nagpur Agreement:*

At the end of para 2.13 in Chapter 2, an inference is drawn that Shri V.P. Naik's statement made in the State Assembly on 20th August 1969 'almost amounted to an abrogation of the Nagpur Agreement'. In my view such an inference is unwarranted. What Shri Naik was replacing was 'The 1960 view that Vidarbha, Marathwada and Konkan were less developed relative to the rest of the State and should be given maximum assistance for their development. 'What Shri. Naik was introducing was 'the districts as units of planning' and 'a direction to secure a balanced development of all the regions of the State the whole of which is more or less underdeveloped. The whole State of Maharashtra may be considered as underdeveloped relative to a few other States in the country. A balanced development of all the regions in the State implied that the disparities of development between the regions would be removed. I do not think that this new direction was in any way opposed to the Nagpur Agreement. Moreover, the Nagpur Agreement did not envisage maximum assistance to Vidarbha, Marathwada and Konkan. What it provided for was equitable allocation of resources. The other provisions in the agreement related to equitable opportunities for recruitment

to State services and facilities for technical education. How can a Chief Minister's statement on the method of allocation of resources nullify these other aspects of the agreement. Even in respect of allocation of resources the agreement makes an exception only in respect of Marathwada and says, 'in view of the underdeveloped conditions of Marathwada, special attention will be given to promote all sided development of that area. That was not, however, analogous to the purported 1960 view of maximum assistance to Vidarbha, Marathwada and Konkan.'

The Nagpur Agreement cannot, in my view, be treated as abrogated by an occasional shift in the policy of any Government in power. The agreement had been conceived as a guiding principle for all future Governments in Maharashtra and its salient provisions- have been incorporated in Article 371(2) of the Indian Constitution as a safeguard against occasional efforts to treat it as abrogated.

In paras 2.13 and 2.14 it is stated that no Member of the House seems to have protested, in my view one had protested because nobody had drawn the inference that Shri Naik's statement was in any way in confli with the Nagpur Agreement or against its provisions incorporated in Article 371 (2).

2. *Non-official Amendments to Article 371(2):*

In para 2.14 it is stated that the two non-official amendments to the Article 371(2) moved in the Parliament were protests against Shri Naik's statement. In fact they were protests against non-invocation of Article 371 (2) though conditions in the State according to those movers long warranted its invocation. One of them was moved in 1973 and the other in 1978,i. e. four and nine years respectively, after Shri Naik's statement of 1969. Protests intended against Shri Naik's

statement would not have been made in Parliament and that too in the form of amendments to the Constitution. I had the privilege of discussing the matter with one of the movers of the amendment, Late Shri S.K. Vayshampayan who held the same view.

3. Necessity of Invoking Provisions of Article 371(2) of the Constitution of India:

In paras 17.43 and 17.44 in Chapter 17, the Committee has come to the conclusion that it is necessary and desirable to have a statutory watch-dog authority with functions of overseeing the operation of the policy and process of reducing regional disparities in development and implementation of the related programmes and making a report every year to the State Legislature. I am in full agreement with this view and also with the Committee's first conclusion (in para 1.7.44) that such an authority must not be political. I could not, however, share the committee's view and the line of argument contained in paras 17.44 to 17.47 of Chapter 17 of the report. I differ specially from the following conclusions:

(i)   It (the watch-dog authority) cannot be regional;

(ii) There has to be a single non-political authority for the whole State;

(iii) It (the authority) should be a single person, non-political, quasi-judicial single authority for the whole State.

The Committee is recommending a legislation at the State level for setting up the authority. It has expressed inability to spell out the details of the required legislation. The suggestion is that a legislation similar in scope and intention to the Maharashtra Lok Ayukta and Up-Lok Ayukta Act of 1971, would be useful. In para 17.47, the Committee has said that an independent authority provides a more effective mechanism to oversee

the process of removal of disparities and to prevent their recurrence than the regional development boards contemplated in Article 371 (2). I do not share this view. The effectiveness of the watch-dog body in such a situation depends upon the politically independent status and powers of the apex authority to whom it reports and the competence and the finality of the verdict given by that apex authority. In my opinion, no watch-dog body in the present political system can be useful or effective unless the Governor exercises his special responsibility independent of the Council of Ministers. No new legislation may be possible to provide for such a special responsibility of the Governor and invocation of Article 371(2) appears the only remedy. Looking to the practical difficulties in getting a new controversial law passed and with a view to avoid tensions likely to be generated through it, it would, in my view, be far more wiser to invoke the provisions of Article 371 (2). A simple majority resolution of the State Legislature may suffice to request the President to invoke the Article.

Both the Nagpur Agreement and Article 371(2) of the Constitution provide for establishment of separate Development Boards for Vidarbha, Marathwada and the rest of Maharashtra. The question is what kind of Development Boards are envisaged here, especially in Article 371(2) Is the Board a

(a)   Planning body formulating short term and long term plans for the respective regions;

(b)   an administrative set up quite high in the hierarchy to get development programmes implemented; or

(c)   an organisation undertaking periodical reviews or evaluation of plan performance in respect of the specific reliefs provided by the Constitution to the three regions of the State ?

Under Article 371(2) the President, by order, provides for a special responsibility of the Governor for establishment of separate Development Boards. Governor's special responsibility in the Article, and that in the marginal heading oy that Article as well as Chapter 19 of the Constitution is by implication analogous to the 'special responsibilities os the Governors' provided in Section 52 or 53 of the Government of India Act of 1935, where it had been expressli said that in that respect the Governor acts on his personal judgement and would not be bound by the advice of ? hs Council of Ministers. Article 371(2) also begins with the words 'notwithstanding anything in this Constitution'. Thil and the heading of the Chapter of the Constitution in which that article appears indicate the Governor's Special Responsibility. The orders made by the President regarding establishment of Regional Committees under Article 371(1) for Punjab and Andhra Pradesh did specify that special responsibility on the lines of Sections 52 and 53 of the Government of India Act 1935.

In my opinion, the Development Boards envisaged in Article 371 (2) cannot be the ordinary type of planning or executive authorities for the region. The concept clearly is of a body which directly assists the Governor in the discharge of his special responsibilities in respect of equitable allocation of development resources, equitable arrangement providing adequate facilities for technical education and vocational training and adequate opportunities for employment in services under the control of the State Government. The Development Boards under Article 371 (2) are, therefore, watch-dog type of bodies (directly responsible to the Governor). The functions of the Boards are to analyse, watch and review whether the allocation of resources, provisions for technical education and recruitment to services are being made under specified principles and to

bring whatever is inconsistent with those principles to the notice of the State Legislature and the Governor through their annual reports.

The mechanism envisaged in Article 371 (2) is to function within the democratic traditions of Government and with due regard to the rights of elected representatives of the people and yet is to duly safeguard regional interests, in respect of matters provided in that Article. The work does not appear to be that simple. It will be putting on trial. the Board Members', faith both in the democratic working and the unity of the State of Maharashtra as well as their sense of responsibility and fair judgement.

Another objection raised against invoking Article 371 (2) is that it implies intervention of the Central Government in the affairs of the State. In my view that is not true. The State itself functions under the Constitution. Appointments of the Governor and of High Court Judges are made by the President. Many bills have to be sent for approval of the Central Government before they are introduced in the Legislature. President's assent is required after they are passed by the Legislature. No one has ever said that these constitutional requirements amount to Central Government's intervention.

With whatever little probing the Fact Finding Committee has been able to do, it has brought forth substantial disparities in development in several sectors. The Committee could not cover many more sectors which might also reveal similar disparities. The question now is of a guarantee that the process of removal of backlog should be carried out with a firm commitment and should not depend upon the political vicissitudes in future.

Recourse to action under Article 371 (2) is, in my view, the only such guarantee available for the-purpose. A mechanism set up under the State's political authority may not, moreover meet the apprehensions of the people in Vidarbha. Marathwada and many lagging districts of Western Maharashtra about their continuing to be neglected in future. The findings of the Committee have shown that their sensivities about the future are not wholly unjustified.

Article 371 (2) rightly envisages three separate Development Boards for the three regions. Their functions would be exacting and at times might also be mutually conflicting. Instead of one authority protecting the interests of all the three regions and their numerous backward districts it should, therefore, be appropriate and quite fair that each region's point of view is separately available to the Legislature and the Governor so that they may discharge their respective responsibilities much better and in a fully informed manner.

In my view therefore, the Committee should have suggested recourse to action under Article 371 (2) as the only appropriate long term safeguard for ensuring

(i)   the backlogs that are presently identified are removed,
(ii)   the process of determining backlogs and removing disparities continues over a long term;
(iii)   the disparities do not recur in future.

APPENDIX E
Reply

Minute of Dissent by Shri B.A. Kulkarni

2. Shri B.A. Kulkarni agrees broadly with the Committee's approach and findings including the need for a watch-dog authority "to oversee the process of reducing regional disparities in development and to report every year to the State Legislature." The main point of Shri Kulkarni's minute of dissent is our concept of the watch-dog authority. We have said: "In the nature of its functions, it is obvious that such an authority cannot be regional and must not be political." We thought it obvious that a body to oversee the process of reducing regional disparities has to be supra-regional, one which will oversee the process in the same perspective in all the regions considered together. Shri Kulkarni does not see this and thinks that three separate regional development boards, as conceived in the Article 371(2) of the Constitution, can function as watch-dog authorities to oversee a unified process of reducing regional disparities operating in their respective regions each considered independently. In fact, Article 371(2) does not specify the functions of the regional development boards. That they are intended to be purely watch-dog type bodies is Shri. Kulkarni's own interpretation and others asking or the establishment of these boards may not agree with this view.

3. Shri Kulkarni agrees with us that the watch-dog authority must not be political. As he points out, we have not been able to spell out the details of the required legislation. But we have suggested that it should be similar in scope and intention to the Maharashtra Lok Ayukta and Up-Lok Ayukta Act of 1971. On that parallel, we have also indicated in some detail the powers and functions of the contemplated watch dog authority and how it would function. To ensure that it remains non-political, we have suggested *inter alia* that it should be a single person and not a committee or a Council because a committee or a council, as it must represent several interests, tends to be political. Article 371(2) does not specify the composition of the regional development boards contemplated therein nor does Shri Kulkarni elaborate his idea of the

development boards, particularly their composition. We do not know therefore how he expects that the regional development boards will be non-political.

4. Shri. Kulkarni notes: "The work does not appear to be that simple. It will be putting on trial, the Board Member's faith both in the democratic working and the unity of the State of Maharashtra as well as their sense of responsibility and fair judgement." Further, he says: "Their functions would be exacting and at times might also be mutually conflicting." We entirely agree. As much as we can see, the regional development boards will be essentially political bodies; their performance will be judged by their advocacy of regional interests, which will unavoidably be partial, with exaggerated grievances and over-stated claims. Their annual reports will tend to be mutually acrimonious and they will set the tone for equally acrimonious debate in the State Legislature. One wonders, how the Governor will find the truth except by instituting an independent enquiry every year. We simply do not see how the watch-dog authority can be split up into three separate multi-member bodies.

5. Another point of Shri Kulkarni's dissent is that in his opinion "no-watch-dog body in the present political system can be useful or effective unless the Governor exercises his special responsibility independent of the Council of Ministers". In our view, the effectiveness of the watch-dog authority depends, in the first instance, on "the objectivity and thoroughness with which he makes his annual report". This is the starting point. His report will be discussed in the State Legislature and this will ensure that he in fact strives to make his report objective and thorough; in his subsequent reports, he must take into account and respond to the criticism and comments made in the State Legislature. Finally, the State Government, that is the Council of

Ministers, being responsible to the State Legislature, must respond and act on this report taking note of the comments and criticism made in the State Legislature. This is the normal democratic process and we see no reason to depart from it.

6. Moreover as Shri Kulkarni points out, the special responsibility of the Governor as envisaged in Article 371 (2) was in respect of (i) equitable allocation of funds for development expenditure, (ii) equitable arrangement for providing adequate facilities for technical education and vocational training, and (iii) adequate opportunities for employment in, services under the control of the State Government. Our report goes much beyond the provisions of Article 371 (2). We have given concrete meaning to the terms "equitable" and "adequate" and we have recommended a specific process which will continue and which can be evaluated in its own terms every year. Our approach to the problem and the specific measures we have suggested go far beyond anything suggested so far and anything conceived in 1957 when Article 371 (2) was incorporated into the Constitution. These measures, which pervade the entire system in great detail, cannot be introduced and sustained over a long period without large public support inside and outside the State Legislature. The watch-dog mechanism we have suggested is a mechanism to gradually build up such a public support for what we believe is a different strategy of development. To make it a special responsibility of the Governor is a retrograde step; it will alienate public sympathy and prevent any public support being built up.

7. Shri Kulkarni says: "A mechanism set up under the State's political authority may not moreover meet the apprehensions of the people in Vidarbha, Marathwada and many lagging districts of Western Maharashtra about their continuing to be neglected in future". Shri. Kulkarni has noted: "With whatever little probing the

Fact Finding Committee has been able to do, it has brought forth substantial disparities in development in several sectors." We should add that little probing has also confirmed large disparities between districts/talukas within Western Maharashtra, within Vidarbha and within Marathwada, voiced at almost every meeting during our tour of the districts. If a watch-dog authority established under a statute of the State Government will not meet the apprehensions of the people of Vidarbha and Marathwada, separate development boards for Vidarbha, Marathwada, and the Rest of Maharashtra, even if established under the provisions of Article 371(2), will equally not meet the apprehensions of the people in the lagging districts/talukas in each of these regions.

8. Consistent with the approach the Committee has adopted to the problem of regional disparities, the watchdog authority cannot be regional and must not be political. To ensure its independence from the Government of the day, it must be statutory. But it is the essence of the matter that it is established by a statute of the State Government; that alone will ensure that the State Government will remain answerable to the annual report of the watch-dog authority.

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