



**SOCIAL AND ECONOMIC  
CHANGE MONOGRAPHS 6**

**DEVELOPMENT POLICIES,  
PRIORITIES AND SUSTAINABILITY  
PERSPECTIVES IN INDIA**

**SHASHANKA BHIDE  
JEENA T. SRINIVASAN**

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## PREFACE

India's development policies have been complex and wide-ranging in their scope. Over the last five and a half decades, the policy process has been evolutionary. There has been some continuity in the process during this long period because economic planning remained critical for decisions relating to the allocation of resources. At the same time, different issues took the centre stage in different periods resulting from the actions of the past as much as the exogenous events.

This monograph is an attempt to capture the evolution of policies in the context of the concerns relating to sustainable development. The canvas is broad and we have attempted to keep the focus on the sustainability perspectives. We have viewed the concept of sustainability in a broader context of development and the use of natural resources. Our attempt is to present a review of the policies based on the documentation available from official sources. We have not provided a critical evaluation of the policies but only a summarisation of the policy efforts as they relate to sustainable development. The objective is to provide a basis for further discussion and debate.

This work is an outcome of a research project commissioned by the Ministry of Environment and Forests through Winrock International India, New Delhi under the National Communication on Climate Change. The grant was made to the Institute for Social and Economic Change, Bangalore where the present research was undertaken.

The authors are grateful to Prof. Gopal K. Kadekodi, Director, ISEC, who gave many suggestions and guidance in the conduct of the project and also on the earlier drafts of this monograph. We also wish to acknowledge the excellent research assistance provided by Ms. G. Aparna. We are also grateful to Mr. B.H.Chandrashekhara for the efficient secretarial assistance. Valuable editorial help from Mr. Parthasarathy led to many improvements in the manuscript.

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*Bangalore*

*Shashanka Bhide  
T.S. Jeena*

## FOREWORD

There have been many attempts in the past to provide reviews of Indian economic development both at the conceptual and empirical levels. The Institute for Social and Economic Change, Bangalore was presented with a unique opportunity to review the national development policies and priorities since the Indian Independence keeping in view the sustainability perspectives. This research was commissioned by the Ministry of Environment and Forests, New Delhi through Winrock International India. The study is an attempt to bring together policies and programmes at the national level framed to bring about economic development that is sustainable into the future.

Although there were differences in the degree of emphasis, India's economic policies have relied largely on the public sector initiatives to achieve the goals of development. Emphasis has been placed on the development of democratic political institutions. Raising the standard of living for the population as a whole has been the key objective of the planning process. However, concerns relating to sustainable use of natural resources have emerged in this process early in the 1980s. The extent to which the goals of sustainable development and economic growth can be combined in policy would depend on the ability of policy makers to understand the implications of each policy measure on one another.

The present research is an attempt to bring together diverse threads of policy to focus on development and sustainability of development. There have been changes and turns in economic policies, especially with respect to strategies and instruments. In the decade of the 1990s, the economic policies became more liberal leaving far greater space for the markets in decisions relating to allocation of resources. The new policy regime, however, has recognised the need for public interventions to safeguard sustainable use of natural resources and also protect the weaker sections of the society from market failures.

What would be the next generation of policies? This monograph only presents a basis for discussions. Its aim is modest, to provide a summary of past policies and developments with an underlying concern on sustainable development.

*December 2003  
Bangalore*

*Gopal K. Kadekodi  
Director, ISEC*

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## ABBREVIATIONS

AMUL	Anand Milk Union Limited
ARWSP	Accelerated Rural Water Supply Programme
AUWSP	Accelerated Urban Water Supply Programme
BSI	Botanical Survey of India
BPO	Business Process Outsourcing
CAD	Current Account Deficit
CADP	Command Area Development Programme
CBD	Convention on Biological Diversity
CBR	Crude Birth Rate
CDR	Crude Death Rate
CETP	Common Effluent Treatment Plant
CNG	Compressed Natural Gas
CPCB	Central Pollution Control Board
CPR	Common Property Resource
DDP	Desert Development Programme
DPAP	Drought Prone Area Programme
DPC	District Planning Committee
DWCRA	Development of Women and Children in Rural Areas
EAS	Employment Assurance Scheme
EPA	Environmental Protection Act
FCCT	Framework Convention on Climate Change
FDI	Foreign Direct Investment
FPC	Forest Protection Committee
FSI	Forest Survey of India
FYP	Five Year Plan
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gases
GOI	Government of India
GSDP	Gross State Domestic Product
HDI	Human Development Index
HYV	High Yielding Varieties
IMT	Irrigation Management Transfer
IPCC	Intergovernmental Panel on Climate Change
IPCP	Industrial Pollution Control Project
IPS	Investment Promotion Scheme
IRD	Integrated Rural Development Programme
IT	Information Technology
IWDP	Integrated Watershed Development Programme
JFM	Joint Forest Management
JRY	Jawahar Rozgar Yojana
LPG	Liquid Petroleum Gas
MFAL	Marginal Farmers and Agricultural Labourers
MINARS	Monitoring Indian National Aquatic Resources Systems

MNP	Minimum Needs Programme
MoEF	Ministry of Environment and Forests
MoWRD	Ministry of Water Resources Development
MSW	Municipal Solid Waste
NABARD	National Bank of Agriculture and Rural Development
NBSAP	National Biodiversity Strategy and Action Plan
NDC	National Development Council
NGO	Non-Governmental Organisation
NLCB	National Land Use and Conservation Board
NLWDC	National Land Use and Wasteland Development Council
NRCP	National River Conservation Programme
NREP	National Rural Employment Programme
NRY	Nehru Rozgar Yojana
NSAP	National Social Assistance Programme
NTFPs	Non-Timber Forest Products
NWDB	National Wastelands Development Board
NWDPR	National Wasteland Development Project for Rainfed Areas
NWMP	National Water Management Project
ODS	Ozone Depleting Substance
PIM	Participatory Irrigation Management
PMGY-RDW	Pradhan Manthri Gramodaya Yojana – Rural Drinking Water
PRI	Panchayati Raj Institution
R & D	Research and Development
RLEGP	Rural Landless Employment Guarantee Programme
RMK	Rashtriya Mahila Kosh
SEWA	Self-Employed Women's Association
SFDA	Small Farmers' Development Agency
SGRY	Sampoorna Gramin Rozgar Yojana
SGSY	Swarna Jayanti Gram Swarojgar Yojana
SHG	Self-Help Groups
SIDBI	Small Industries Development Bank of India
SJSRY	Swarna Jayanti Sahari Rozgar Yojana
SPM	Suspended Particulate Matter
SSIs	Small Scale Industries
TDET	Technology Development Extension and Training
TEDDY	Tata Energy Data Directory and Year Book
TERI	Tata Energy Research Institute
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
VFC	Village Forest Committee
WDF	Watershed Development Fund
WDPSA	Watershed Development Programme in Shifting Cultivation Areas
WDR	World Development Report
WHO	World Health Organisation
WUAs	Water User's Associations
ZSI	Zoological Survey of India

# **CHAPTER I**

## **THE DEVELOPMENT PROCESS AND PRIORITIES**

### **1. Introduction**

Indian economy has been among the top 15 fastest growing economies in the world for the last two decades. This has led to expectations of even better performance in the coming decade. The change from a relatively slow growing economy in comparison to the performance of the more successful economies of East, South-east Asia and China to one of high growth has also led to renewed emphasis on achieving significant reduction in poverty and providing basic minimum services such as health and education to a population of more than one billion citizens today. While India is still among the poor countries in the world with a per capita GDP of US\$460, its skilled labour force, strong technical capabilities and increasing openness to trade and investment have raised the potential for sustained faster economic growth. The X Five Year Plan (FYP)<sup>1</sup> of the country has set an ambitious goal of 8 per cent annual growth in GDP in constant prices over the next five years. India clearly has a long way to traverse on development path before the cherished goal of the nation's founders in freeing her people from economic backwardness can be realised.

When India achieved its independence from the colonial rule it faced the challenges of its survival as a united free nation. Political freedom from Colonialism in 1947 marked the beginning of a national endeavour to achieve freedom from poverty and backwardness arising from decades of economic stagnation. Focus on achieving better standards of living to all the citizens has been a continuing theme in Indian policies. Over the last fifty-five years since independence there have been new policy challenges as well. Relatively slow economic progress in the first three decades since independence led to a search for new policies. The shocks from nature in the form of famines and floods led to strategies for self-sufficiency in food. The external shocks of sharp oil price hikes in the early 1970s and in the late 1970s led to a focus on new energy policies. The wars with neighbours had their own impact on priorities on resource allocation for development. Through over five decades of efforts at economic and social development the nation has recognised the need for a sustainability perspective in all the development efforts. Sustainability of development in terms of continued economic growth, social progress, protection and preservation of natural resources and environment for posterity has found expression in all the policies, especially in the last two decades. The corner stone of economic policies is still eradication of

poverty. However, eradication of poverty is also consistent with sustainability of development. The economic policies, therefore, must focus on sustainable development as they do on poverty eradication.

In this paper we review the development policies and priorities in India in the last five and a half decades. The review identifies the key areas of focus in government policies. We maintain the perspective of sustainability in the development process in the review. The development policies are clearly quite wide ranging as they touch all aspects of nation's life. Our focus, therefore, will be on key areas of development policies by which resource allocations are effected, by which development is, in fact, measured and by which development can be sustained.

We draw attention to various policy measures relating to sustainable development do not offer a critique of these efforts on a systematic basis as this would require analyses much beyond the scope of this paper. Joshi and Little (1994 and 1996) are among the excellent sources of analytical assessment of India's macro-economic management. The review draws heavily on the process of FYPs of India. The changing concerns of public policy in India are best traced in the evolution of the FYPs that reflect the overall national goals and policies towards development. India resorted to planning process as a means to launch a coherent development programme. The planning process adopted a systematic review of the existing social and economic scenario, set for itself specific development goals and came up with programmes and strategies to achieve the goals. In this exercise of FYPs, the changing perspectives on policies as influenced by past experience, new knowledge and new circumstances found an expression in the re-orientation of priorities or new approaches to the same problems. In this sense, the FYPs provide a comprehensive review of the policy perspectives on development in the country.

The review of development policies and priorities presented here is organised in three main chapters. In Chapter I, we first provide an overview of the focus in the planning effort as indicated by the specific objectives of the various FYPs. This is followed by a discussion of trends in some of the variables reflecting major concerns of policy. For example, trends in overall economic growth, structure of the economy and pattern of consumption that is emerging over time. In Chapter II, we provide a discussion of strategies that were adopted for implementing the policy objectives. The final Chapter provides the sustainability perspectives in some of the major sectoral development policies.

## **2. Development Policy Objectives and Priorities**

The First FYP launched in 1950 noted that industrial development, urbanisation and expansion of commerce had taken place in the previous few decades (Planning Commission, 1951). But it went on to point to the limited nature of this progress and noted that 83 per cent of the country's population residing in the rural areas suffered from chronic underemployment and low income. Rapid economic development was a key policy imperative for the new government. The new nation was diverse in terms of social and cultural milieu. It was large in terms of both population and geography and adopted a democratic and constitutional form of government. It was also a government of a federal nature with the powers and responsibilities of governance divided between the states and the central government. The strategy for development, therefore, had to be formulated in a manner that had the support of a large section of the population.

The government of the time adopted 'planning' approach to development policy. Planning was to be a participatory process with the involvement of all sections of the society. The planners were given a mandate based on the constitutional assurance to the citizens of right to livelihood. Planning was also to focus on the ways to improve the economic situation of the poor and downtrodden with the objective of building a 'socialistic pattern of society'.

This objective of economic growth with equity, interwoven in a number of other broad development goals was pursued in the successive FYPs that were launched since 1950. The FYPs were used to provide a cohesive statement of the development objectives and priorities. The plans also provided the strategies and allocation of national resources to achieve these objectives. India's Planning Commission, set up in March 1950, was charged with the task of initiating programmes and policies for bringing about rapid improvements in the citizens' incomes and ensuring that the wider goals of equity are met. Common good was the constant refrain in the responsibilities entrusted to the Planning Commission. The Planning Commission, composed of members who are experts in various fields has the Prime Minister as its Chairman. To overcome the conditions of poverty and backwardness, planning was meant to be a rational solution to the problems attempting to co-ordinate means and ends. And it was never improvements in incomes alone that the plans pursued. The first FYP document observed that the central objective of planning is to create conditions in which living standards are reasonably high and all citizens, men and women should have full and equal opportunity for growth and

service. The objective was not only to build up a big productive machine, which is a necessary condition of development, but at the same time to also improve health, sanitation and education and create social conditions for vigorous cultural advance. The I FYP declared that, planning must mean co-ordinated development in all these fields.

In the context of a democratic and pluralistic society, it was important for the planners to impart strong elements of participatory and broad-based characteristics to the process of planning to make the process sustainable. Right from the beginning, the planning process explicitly noted the need for full support for the development efforts from across all segments of the society. The FYPs were made with much debate and discussion across different segments of the society. At the political level, the federal nature of the government required consultations between the Central government and the State governments. With the policy making in a democratic setting, the FYPs could not ignore the diversity of views on many aspects of policy in political life.

The first FYP noted the need for evolving consensus on key policy objectives both across the political parties and between the Central government and the State governments given the federal nature of the Indian nation. The instrument for bringing about the national consensus, particularly among the states and the Central government was the National Development Council set up in 1952. The NDC comprises of the Prime Minister and the Cabinet of the Central government and the Chief Ministers of the State governments. The Chief Ministers of the States are consulted by the Planning Commission while formulating the approach to FYPs. The FYPs are approved by the NDC at different stages of the plan formulation process, starting with the approach to the plan to the final plan itself.

Planning clearly cannot be a rigid approach to policy. It has to respond to the changing and unanticipated situations, both on the domestic and international fronts. While the original objectives of planning, to eliminate poverty and raise the standard of living of its people have remained, explicitly or otherwise, in all the ten FYPs formulated to-date, the changing concerns over time can be seen in the objectives enunciated in different plans.

Each FYP put forward the thrust of the plan in its statement of objectives. Clearly, setting specific targets and objectives to articulate strategies and programmes to meet these specific objectives is an integral process of planning. Thus, although growth of national income or per capita income is an implicit goal in all the FYPs, it is not given the same emphasis in all the FYPs. To understand this emphasis, we reviewed those goals that were explicitly noted as objectives in the various FYPs and summarised in

Table 1 the key concerns expressed in the statement of objectives. The table provides an overview of the changing emphasis that the various FYPs seem to reflect. For instance, all FYPs have a target of national income but it is not explicitly stated in the discussion of objectives of the plan in each FYP.

The evolution of the plan objectives clearly has an underpinning of the goal of reduction or elimination of the poverty and at the same time to achieve development in a variety of dimensions. There is a focus on particular goal or even an instrument in some of the plans addressing specific concerns and circumstances of the times. For example, concerns on food security and energy security expressed in the IV FYP and VI FYP, respectively, follow the impact of severe drought in the 1960s and the oil price shock of 1979. The concern on unemployment and the need to generate jobs arise from the massive additions to the labour force from a growing population and the strains in the policy that is caused from unemployment of large proportions.

The importance of poverty reduction and generation of employment did not deter the planning process from addressing the concerns relating to environment and technology development more explicitly. There has been an attempt to approach both sets of issues in a complementary manner. We outline below some of the common themes in the objectives and priorities in the Indian development programmes.

### **3. Raising the Standard of Living: Trends in Income, Consumption and Social Indicators**

#### ***(a) Income Trends***

National income or similar notions of economic value of all goods and services produced in an economy have often been measures of the total resources available to a country in any given period of time. It is also a measure of welfare in that it is indicative of the purchasing power of the population of a country as a whole with which the economic needs can be met. While the limitations of the concepts such as gross domestic product (GDP) as measures of welfare were recognised in all the policy statements, it is often used as a specific target for FYPs. The First FYP notes that GDP is a measure of the performance of the economy as a “productive machine”. The concept has now been broadened to include other dimensions of development, in the form of ‘Human Development Index’ in its different variants.

Based on the Gross Domestic Product as a measure of performance of the economy, India’s performance was rather slow until the end of 1970s.

The economy saw an acceleration of growth in the 1980s which was sustained in the following decade. The rising levels of real per capita income have been illustrated in Figure 1. The emphasis on raising the level of GDP or level of economic activity, in the early years of economic planning can be understood in the context of the low level of GDP per capita at the time of Independence. As shown in Figure 1, the per capita GDP at the end of I FYP in 1955-56 was only US \$ 58. As we show later in this monograph, incidence of poverty in the 1950s exceeded 50 per cent in some years.

The pace of economic growth can be gauged from the rates of growth real GDP and per capita real GDP presented in Table 2. The GDP in constant prices was registering a slow growth of well below 5 per cent per year, the usual target for the FYPs then, up to the V FYP. In all the subsequent four FYPs, the rate of growth exceeded this 5 per cent mark. Measured in terms of per capita GDP, the average income rose at an annual growth rate of less than 2 per cent in three of the first four FYPs. The growth accelerated to more than 4.5 per cent per year in the VIII FYP but dropped to 3.5 per cent in the IX FYP. India's performance in economic growth did not compare favourably with the high performance of China and the South East Asian economies, especially in the 1970s and 1980s. However, in comparison to her own past performance India's overall real GDP growth has improved in the 1980s and 1990s. Even across the countries, India's economic growth performance in the 1980s and 1990s has been impressive (World Bank 2002).

The rise in GDP is also marked by rising contributions from non-agricultural sectors of the economy. The changing structure of economic output over the years is illustrated in Figure 2. The pattern of development all over the world generally followed the transition from agricultural to industrial and tertiary sectors. Indian economy is witnessing a swifter movement to the tertiary sector with the services registering faster rate of growth than the other sectors, particularly in the 1990s. The tertiary sector today accounts for more than 50 per cent of India's GDP, almost as much as China's which has a much higher level of per capita GDP than India. Increasing globalisation of markets and dynamic shifts in comparative advantage in production and trade have an influence on the structure of the economy. In the Indian context, disadvantages of relatively underdeveloped infrastructure may be hindering the growth of manufacturing sector leading to faster growth of services. The growth of services sector has also witnessed rise in the informal sectors in the services. Thus, the transition from primary to tertiary sector economy has not been an entirely positive outcome.

**Table 1. Objectives Reflecting the Priorities in India's Five-Year Plans**

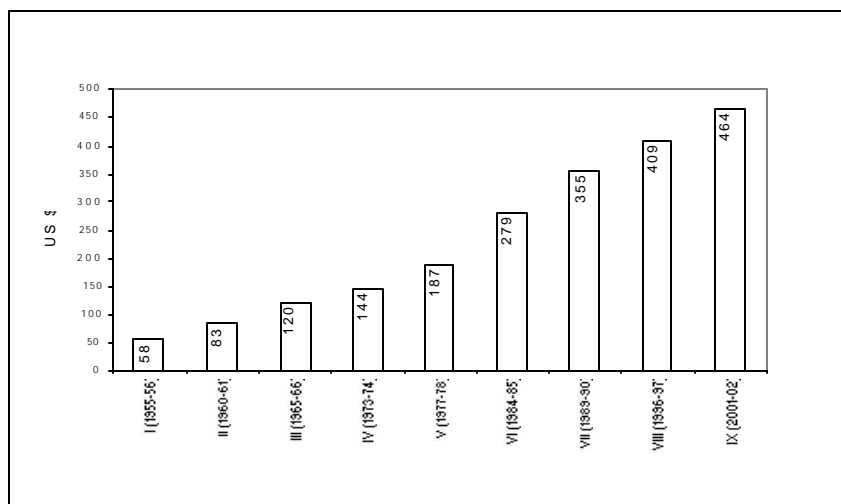
Sl. No.	Areas of Concern	The Specific objectives									
		IFYP (1951-52 to 1955-56)	II FYP (1956-57 to 1960-61)	III FYP (1961-62 to 1965-66)	IV FYP (1969-70 to 1973-74)	V FYP (1974-75 to 1977-78)	VI FYP (1980-81 to 1984-85)	VII FYP (1985-86 to 1989-90)	VIII FYP (1992-93 to 1996-97)	IX FYP (1997-98 to 2001-02)	X FYP (2002-03 to 2006-07)
1	Economic growth/ macroeconomic strategies	Target of 2.2 per cent growth per year in the national income	Target of annual growth of 5 per cent in real GDP	Price stabilisation; raise export growth by 7 per cent per year; raise public sector investment to 60 per cent of total	Long term perspective	Accelerated growth	Self-sustaining growth in terms of finance and technology in the next ten years		Accelerated growth with price stability	8 per cent annual growth of GDP	
2	Poverty/ Social welfare	Progress of backward groups in the society	Opportunities for weaker and underprivileged; balanced regional development	Reduce inequality as a long term goal	Eliminate poverty	Reduce poverty	Eliminate poverty; reduce regional imbalances		Empowerment of socially disadvantaged women	Reduce poverty by 5 per cent points by 2007 and by 15 per cent points by 2012 from the level of about 25 per cent in 2002.	
3	Minimum needs/ social sector goals		Social services in rural areas were	Minimum needs recognised	Improve quality of life	Meeting the needs of food, clothing, shelter; universal	Universal elementary education; safe drinking water;	Food & nutritional security especially to vulnerable	Monitorable targets for human development; all children in school by 2003,		

SL Areas of		The Specific objectives									
No.	Concern	IFYP (1951-52 to 1955-56)	II FYP (1956-57 to 1960-61)	III FYP (1961-62 to 1965-66)	IV FYP (1969-70 to 1973-74)	VFYP (1974-75 to 1977-78)	VI FYP (1980-81 to 1984-85)	VII FYP (1985-86 to 1989-90)	VIII FYP (1992-93 to 1996-97)	IX FYP (1997-98 to 2001-02)	X FYP (2002-03 to 2006-07)
		proposed									
4	Population goals				Launching of Family Welfare Programmes	Reduce growth		elementary education, access to health facilities to all	health care; immunisation; eliminate scavenging	groups; basic minimum services to be provided in a time bound manner	5 years' schooling by 2007; literacy rate 75 per cent by 2007
5	Employment goals		Large expansion	Substantial expansion		Expansion	Reduce unemployment	Near full employment as a long term goal; reduce unemployment	Near full employment in the long term; adequate employment in the plan period	Contain growth	Decadal growth of 16.2 per cent between 2001 and 2011
6	Self-reliance			Self-sufficiency in food grains	Decrease reliance on foreign aid	Agriculture, energy and critical inputs	Economic and technological self-reliance			Self-reliance	
7	Local planning, participation		Push to co-operatives;	Greater local planning			Decentralised Planning and			People sector (NGOs);	

SL Areas of		The Specific objectives									
No. Concern	IFYP (1951-52 to 1955-56)	II FYP (1956-57 to 1960-61)	III FYP (1961-62 to 1965-66)	IV FYP (1969-70 to 1973-74)	V FYP (1974-75 to 1977-78)	VI FYP (1980-81 to 1984-85)	VII FYP (1985-86 to 1989-90)	VIII FYP (1992-93 to 1996-97)	IX FYP (1997-98 to 2001-02)	X FYP (2002-03 to 2006-07)	
8	Agriculture/ rural sector	Top priority rural India	Rebuild rural India	Food production, surplus for industrial needs	Self-reliance; build buffer stock of food	Raise agricultural growth	Development; involvement of NGOs	Surplus for exports	Focus area to generate employment and eradicate poverty	promoting Panchayati Raj institutions	
9	Industry	Focus on steel, heavy chemicals, electrical machinery industries for public investment	Industrial progress; push for small scale industry	Expand basic industries, establish machine building capacity		Modernisation	International competitiveness in the next ten years				
10	Infrastructure including energy	Focus on power and transport for public investment				Conservation and efficiency in use		Strengthen infrastructure for growth			
11	Environment					Protection & Improvement			Protection & Improvement through social mobilization	Protection & improvement specific goals for forest cover and cleaning of rivers & water stretches	

Source: Planning Commission (1951, 1956, 1961, 1971, 1976, 1981, 1985, 1998, 2000 and 2003)

**Figure 1. Per Capita GDP at Market Prices (US \$): End of Each FYP Period**



*Note:* To focus attention on the experience of the economy through different five year plans, we have provided information corresponding to different FYPs. However, to provide an overall perspective, data relating to periods of different decades is also presented. This pattern is adopted in all the tables and figures in the paper.

*Source:* RBI (2001)

### **(b) Consumption Trends**

Per capita income represents purchasing power. Improvement in incomes is expected to influence the pattern of consumption as well. Higher average household incomes have led to rise in per capita consumption of goods and services over time. As shown in Figure 3, level of per capita consumption expenditures of the households has increased over time, with a rising pace witnessed from VI FYP onwards. Coinciding with acceleration in per capita income, the average level of consumption has also increased at a faster pace. The pattern of consumption has also shifted in favour of non-food items over time and in favour of consumer durables within the non-food items (Table 3).

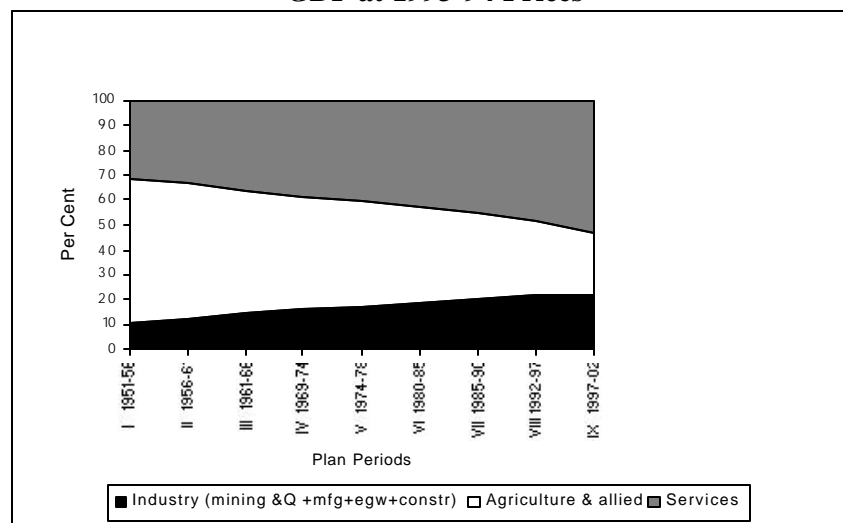
**Table 2. Trends in GDP, Population and Per Capita GDP**

Five Year Plan	Period	Per Capita GDP(MP)		Annual Growth Rates (%)		
		Rs (current prices)	US \$	Population	GDP(FC) (constant prices)	Per capita GDP (constant prices)
I	1951-56	277	58	1.83	3.61	1.75
II	1956-61	396	83	2.00	4.27	2.22
III	1961-66	570	120	2.25	2.84	0.58
IV	1969-74	1,131	144	2.29	3.35	1.05
V	1974-78	1,602	187	2.25	4.72	2.41
VI	1980-85	3,322	279	2.16	5.64	3.40
VII	1985-90	5,915	355	2.15	5.96	3.73
VIII	1992-97	14,509	409	1.95	6.69	4.65
IX	1997-2002	22,141	464	1.92	5.72	3.48
	1950s	307	64	1.92	3.59	1.64
	1960s	576	101	2.19	3.96	1.73
	1970s	1,357	165	2.30	2.94	0.63
	1980s	3,694	307	2.16	5.80	3.56
	1990s	12,477	375	1.89	5.80	3.84

Note: Per capita GDP in US \$ has been estimated using the average exchange rate for the year; MP = market prices; FC= factor cost.

Source: RBI (2001)

**Figure 2. Changing Structure of the Economy: Share of Sectors in GDP at 1993-94 Prices**

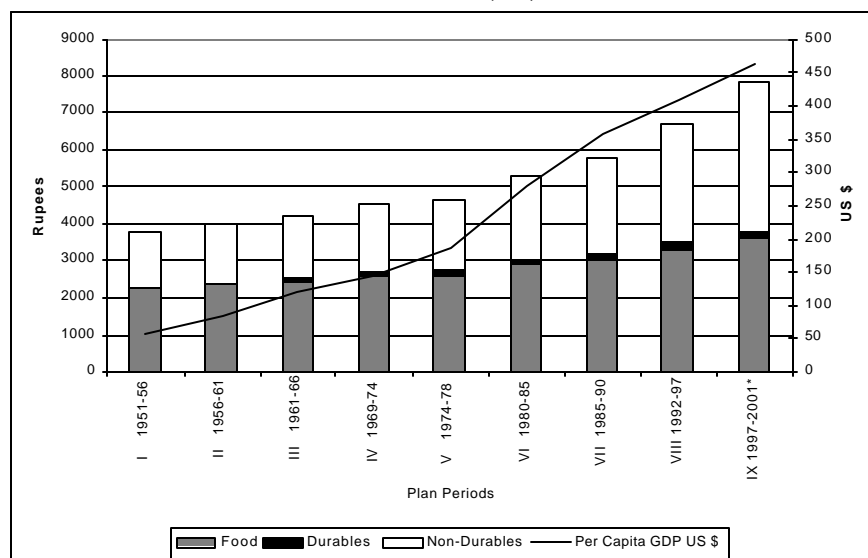


Source: EPW (2002)

Within the food items, there is a shift from basic foods such as cereals and pulses to protective foods such as fruits and vegetables, milk, meat, fish and eggs. There is actually a decline in the consumption expenditure on cereals and pulses in the IX FYP period. During this period output of foodgrains was erratic. In 1997-98 it fell by 4.3 per cent and in 2000-01 the decline was about 6.5 per cent.

Although not all the decline in output is translated into consumption decline, the impact is significant. The share of processed foods such as edible oils and sugar has also increased over time. On an average, there is higher consumption of goods and services on per capita basis today than before and there is greater diversification of the consumption basket. The rising income has meant opening up of a large market for consumer goods in the country.

**Figure 3. Trends in Per Capita Consumption Expenditure at 1993-94 Prices (Rs)**



Source: RBI (2001) and EPW (2002)

### (c) The Social Indicators

The average levels of income and consumption expenditures do not fully reflect the other dimensions of development of the economy. Although income provides households and individuals with purchasing power, the 'standard of living' need not necessarily vary in the same fashion as the income variable. The Human Development Index (HDI), pioneered by the

UNDP draws attention to variables relating to educational and health attainment indicators. As the HDI is available only for the period starting in early 1990s, we do not provide this estimate at this point. In Table 4, we present the improvements in selected indicators relating to education and health in India over the past decades.

There has been a slow rise in the proportion of the population who possess basic 'literacy'. The level of literacy has always been higher for the males than the females although the gap is now narrowing.

**Table 3. Changing Pattern of Consumer Expenditure**

Annual Average Growth Rate ( %) of PFCE at 1993-94 prices								
Five Year Plan	Period	Food	Cereals & Pulses	Other Food	Non-Food	Durables	Non-Durables	Total
I	1951-56	3.41	4.73	2.61	3.46	3.66	3.46	4.13
II	1956-61	3.98	4.58	3.75	3.09	7.21	2.98	3.69
III	1961-66	1.84	0.01	3.13	3.86	7.68	3.74	2.35
IV	1969-74	1.85	0.89	2.49	3.13	8.14	2.90	2.44
V	1974-78	4.42	4.46	4.55	4.09	6.01	3.99	4.37
VI	1980-85	4.96	5.79	4.72	5.43	6.74	5.37	5.00
VII	1985-90	3.32	3.39	3.42	5.61	5.85	5.61	4.39
VIII	1992-97	4.42	2.79	5.23	5.92	6.22	5.91	5.14
IX	1997-01*	0.75	-4.44	2.82	9.99	8.65	7.44	4.17
	1950s	3.42	4.39	2.93	3.22	5.15	3.17	3.71
	1960s	3.34	3.04	3.63	3.34	8.20	3.17	3.18
	1970s	2.18	0.42	3.33	3.82	5.49	3.74	2.81
	1980s	4.14	4.59	4.07	5.52	6.29	5.49	4.70
	1990s	3.90	1.94	4.77	5.24	5.05	6.05	4.68

Note: \* data available only up to 2000-01

Source: EPW (2002)

The proportion of literate population is also higher in the urban areas than in the rural areas. The 'enrolment ratios' in schools have increased over time for children in the age group of 5-10 years where basic primary education is imparted. The current levels of close to 100 per cent are encouraging with reference to the goal of universal primary education. The X FYP that was launched in 2002 aims at achieving a literacy rate of 75 per cent by 2007 from the current levels of about 65 per cent.

There has been an improvement in health status in terms of lower infant mortality rates (from 115 per thousand in 1961 to 71 per thousand in 2001) and higher life expectancy at birth (from 32.1 years in 1950-51 to over 60 years in 2000-01). Death rate per thousand has fallen from 27.4 in 1950-51 to 8.5 in 2000-01, the birth rate from 39.9 to 25.8 during the same period.

**Table 4. Improving Health and Education**

Year	Health Indicators			Education Indicators (%)					Enrolment Ratios (%)				
	IMR Per '000	Death Rate per '000	Life Expectancy Years			Male Literacy	Female Literacy	Total	Primary Education				
			Male	Female	All				Boys	Girls	Total		
1951	146	27.4	41.9	40.6	41.3	27.2	8.9	18.3	NA	NA	NA	NA	
1961	115	22.8	47.1	45.6	46.4	40.4	15.4	28.3	NA	NA	NA	NA	
1971	129	14.9	50.5	49.0	49.7	46.0	22.0	34.5	95.5	60.5	78.6	78.6	
1981	110	12.5	55.4	55.7	55.4	54.4	30.0	43.6	95.8	64.1	80.5	80.5	
1991	80	9.8	59.7	60.7	60.3	64.1	39.3	52.2	114.0	85.5	100.1	100.1	
2001	68	8.5	63.9	66.9	65.3	75.9	54.2	65.4	104.9	85.9	95.7	95.7	
					Goals of X Plan								
2007	45	NA	NA	NA	NA	NA	NA	75.0	100.0	100.0	100.0	100.0	
2012	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Source: Government of India (2003) and Government of India (2000a).

India has built up a large health infrastructure and manpower in government, voluntary and private sectors. Both technological advances and better access to health facilities have resulted in improved health status of the population. Table 5 has a summary of selected health indicators which point to progress in the development of health care infrastructure and reduction in some of the dreaded diseases.

The improvement in health status as reflected in a variety of indicators is substantial. However, the current levels of health indicators are still below the levels seen in developed economies and in several of the developing economies. India has a ranking of Human Development Index (HDI) far below that of a country of similar size in terms of population such as China, indicating the gap in development for India (Table 6).

**Table 5. Health Infrastructure, Decline in the Threat of Major Diseases**

Particulars	1951	1981	1991	Approx. in 2001
No. of hospitals	2,694	6,804	11,174	43,322
No. of dispensaries	6,515	16,751	27,431	
PHCs	725	57,363	NA	163,181
Beds per '000 population	32	83	65	NA
Doctors per '000 population	0.17	0.39	0.47	0.56
Incidence of dreaded diseases				
Diseases	1951	1981	2000	Goal of Eradication by Year
Malaria (million cases)	75	2.7	2.2	NA
Leprosy (cases per 10,000 population)	38.1	57.3	3.7	2005
Small Pox (No. of cases)	>44,000	Eradicated	NA	NA
Polio (No. of cases)	NA	>29.79	26.5	2005

*Source:* Government of India (2003) and Government of India (2000a)

#### 4. Regional Dimension of Development

Given the large geographical size of the nation with varied resource endowments and different patterns of production depending on historical patterns of investments in industry, infrastructure, agriculture, and markets across the country, the development experience has also varied over time across the country. The average levels of per capita state domestic product (similar to the measures of GDP at the national level, subject to a number of

**Table 6. India's Ranking in HDI**

Country	HDI Rank in		HDI in		Per Capita GNP US \$	
	1992	2000	1992	2000	1992	2000
Norway	5	1	0.932	0.942	26280	33650
Australia	7	5	0.927	0.939	17730	20530
Sri Lanka	90	89	0.704	0.741	540	870
China	94	96	0.594	0.726	470	840
Indonesia	105	110	0.637	0.684	670	570
India	135	124	0.439	0.577	310	460
Pakistan	132	138	0.483	0.499	420	470
Nepal	149	142	0.343	0.49	170	220
Bangladesh	146	145	0.364	0.478	220	380
Mozambique	159	170	0.246	0.322	60	210
Ethiopia	161	168	0.227	0.327	110	100
Niger	169	172	0.207	0.277	280	80

*Source:* Government of India (2003); UNDP (1994 and 1995); World Bank (2002)

caveats) have varied at different rates over time (Table 7). Taking the period since 1980-81 for which relatively better data are available, the average annual rate of growth of GSDP (in real terms) has shown significant variation across the states. In terms of average levels of GSDP, among the major states, Delhi had the highest per capita GSDP in 1980-81, which was 4 times the level for Bihar, with the lowest per capita GSDP. Goa had the second highest per capita GSDP in 2001-01 and Bihar the lowest. But, now, Delhi's per capita GSDP is about six times Bihar's.

A look at the pattern of projected growth in the X Plan and levels of per capita GSDP in 1999-00 shown in Figure 4 indicates that variability in the levels of per capita GSDP will continue to persist given the potential for higher growth in the more developed regions in the immediate future.

The regional variations in terms of their indicators of development such as education and health are also wide (Table 8).

Literacy rate is the highest in Kerala at 90.92 per cent in 2001 while it is the lowest in Bihar at 47.53 per cent. In 1951, it was the highest in Kerala at 40.7 per cent and the least in Rajasthan at 8.95. The infant mortality rate is the lowest in Kerala at 16 per thousand live births in 2001 and the highest in Orissa at 98 per thousand. In 1961, the infant mortality rate was the least again in Kerala at 52 per thousand and the highest in Madhya Pradesh at 150 per thousand.

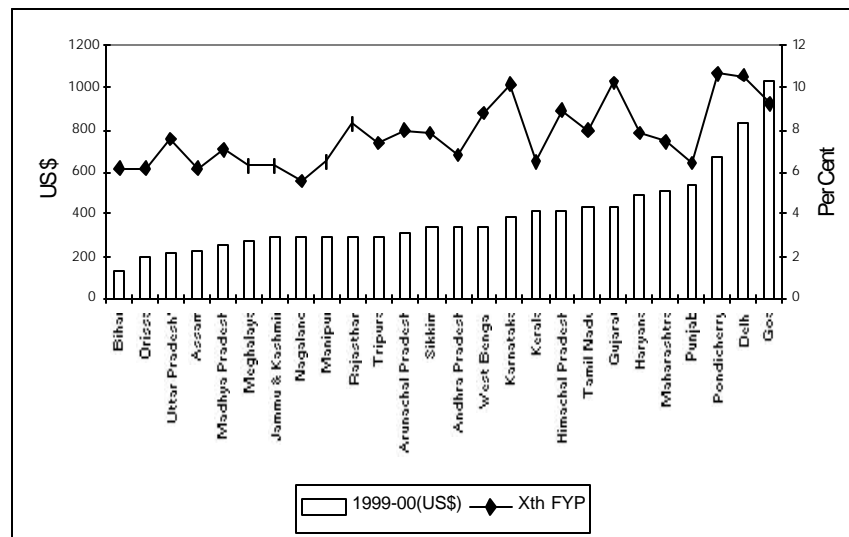
**Table 7. Per Capita Income (GSDP) and Growth Rate of Per Capita GSDP for Selected States**

Sl. No	States (in Ascending Order of Per Capita GSDP in 1999-00)	Per Capita GSDP (Nominal)				Growth Rates of Real Per Capita GSDP Per Cent Per Year	
		Rs.1980-81	Rs 1999-00	US\$1980-81	1999-00 (US\$)	Avg. VIII- IX FYP	X FYP
1	Bihar	1,022	5,893	129.2	136.0	3.1	6.2
2	Orissa	1,352	8,733	170.9	201.5	3.6	6.2
3	Uttar Pradesh*	1,319	9,323	166.8	215.2	4.5	7.6
4	Assam	1,329	9,720	168.0	224.3	2.5	6.2
5	Madhya Pradesh	1,609	11,313	203.4	261.1	5.2	7.0
6	Meghalaya	1,538	12,083	194.4	278.9	5.0	6.3
7	Jammu & Kashmir	2,152	12,373	272.1	285.6	5.1	6.3
8	Nagaland	1,607	12,594	203.2	290.7	5.8	5.6
9	Manipur	1,396	12,721	176.5	293.6	5.5	6.5
10	Rajasthan	1,424	13,046	180.0	301.1	5.5	8.3
11	Tripura	1,645	13,195	208.0	304.5	7.0	7.3
12	Arunachal Pradesh	1,522	13,352	192.4	308.1	4.8	8.0
13	Sikkim	1,545	14,751	195.3	340.4	6.8	7.9
14	Andhra Pradesh	1,467	14,878	185.5	343.4	5.0	6.8
15	West Bengal	1,925	14,894	243.4	343.7	6.6	8.8
16	Karnataka	1,644	16,654	207.8	384.4	6.7	10.1
17	Kerala	1,835	17,709	232.0	408.7	6.1	6.5
18	Himachal Pradesh	1,820	17,786	230.1	410.5	6.2	8.9
19	Tamil Nadu	1,666	18,623	210.6	429.8	6.7	8.0
20	Gujarat	2,089	18,685	264.1	431.2	8.2	10.2
21	Haryana	2,437	21,551	308.1	497.4	4.7	7.9
22	Maharashtra	2,492	22,604	315.0	521.7	6.8	7.4
23	Punjab	2,629	23,254	332.4	536.7	4.6	6.4
24	Pondicherry	3,201	29,348	404.7	677.3	10.1	10.7
25	Delhi	4,145	36,515	524.0	842.7	6.9	10.6
26	Goa	3,200	44,613	404.6	1,029.6	7.2	9.2

Notes: \*Estimated excluding Uttaranchal

Source: Government of India (2003); Planning Commission (2003)

**Figure 4. Per Capita Income (1999-2000) and Projected Growth in X Plan: Major States**



Source: Government of India (2003) and Planning Commission (2003)

Life expectancy at birth is the highest at 75 years in Kerala and the least in Madhya Pradesh at 58.01 years for the period 2001-06.

The large variations in the performance of the state economies are also captured in the Human Development Index computed by the Planning Commission (Table 9). For the 15 major states that we have considered here, Kerala has the top rank in all the three years of 1981, 1991 and 2001. Bihar has the lowest position in the rankings.

### 5. Poverty Reduction

In all the FYPs starting from the first, reduction in poverty has been a major explicit or implicit objective of government's economic policy. In terms of a simplistic measure of poverty, the 'head count ratio', the success of policies in reducing poverty was marginal until the 1970s. Although there are problems in comparison, the incidence of rural poverty between 1956-57 and 1973-74 showed no declining trend until 1969-70 but then declined in the next two years. In the subsequent period, however, there has been a reduction in poverty over the years. From a level of 54.9 per cent in 1973-74 for rural and urban population combined, the incidence of poverty declined to 36 per cent in 1993-94 and an estimated 26.1 per cent in 1999-2000. The X Five-Year Plan has targeted a ratio of 19 per cent by the end of plan

**Table 8. Selected Indicators of Human Development Across States**

Sl. No.	State	Life Expectancy at Birth in Years (2001-06)		Infant Mortality Rate Per Thousand Live Births (2000)			Birth Rate Per 1000 (2000)	Death Rate Per 1000 (2000)	Literacy Rates Per Cent 2001
		Male	Female	Male	Female	Total			
		1	AP	63	65	66			
2	Assam	59	61	66	83	75	27	10	64.28
3	Bihar	66	65	62	61	62	32	9	47.53
4	Gujarat	63	64	59	67	62	25	8	69.97
5	Haryana	65	69	63	71	67	27	8	68.59
6	Karnataka	62	66	65	47	57	22	8	67.04
7	Kerala	72	75	15	13	14	18	6	90.92
8	MP	59	58	81	93	87	31	10	64.11
9	Maharashtra	67	70	46	50	48	21	8	77.27
10	Orissa	60	60	98	92	96	24	11	63.31
11	Punjab	70	72	45	62	52	22	7	69.95
12	Rajasthan	62	63	76	81	79	31	9	61.03
13	Tamil Nadu	67	70	49	54	51	19	8	73.47
14	Uttar Pradesh	64	64	81	87	83	33	10	57.36
15	West Bengal	66	69	54	47	51	21	7	69.22
	India	64	67	67	69	68	26	9	65.38
	Maximum in	Kerala	Kearala	Orissa	Orissa	Orissa	UP	Orissa	Kerala
	Minimum in	MP & Assam	MP	Kerala	Kerala	Kerala	Kerala	Kerala	Bihar

Source: Government of India (2003).

period, 2006-07. The trends in incidence of poverty at the national level are illustrated in Figure 5.

While the reduction in incidence of poverty by 50 per cent of the initial ratio between 1973-74 and 1999-2000 was significant, the level of incidence is still high. The number of poor in 1999-2000 were an estimated 260.3 million with 74 per cent of them residing in rural areas. Using the norm of US\$ 1 per day, nearly 25 per cent of world's poor were in India. The persistence of high levels of poverty at the aggregate level is also a pointer to the high levels of chronic poverty, an issue that is only beginning to receive some attention now (Mehta and Shah 2003).

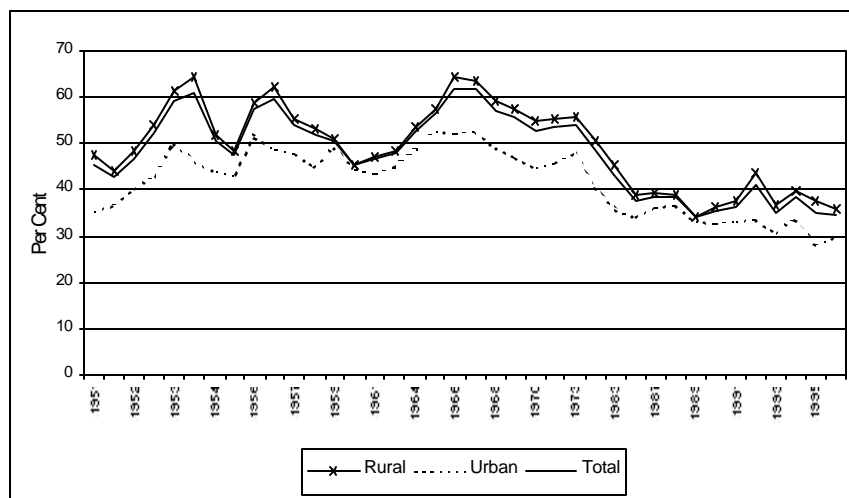
**Table 9. Human Development Index 1981, 1991 and 2001  
(Arranged in Rank Order of 1991)**

Sl. No.	States/UTs	1981		1991		2001	
		Value	Rank	Value	Rank	Value	Rank
1	Kerala	0.500	1	0.591	1	0.638	1
2	Punjab	0.411	2	0.475	2	0.537	2
3	Tamil Nadu	0.343	7	0.466	3	0.531	3
4	Maharashtra	0.363	3	0.452	4	0.523	4
5	Haryana	0.360	5	0.443	5	0.509	5
6	Gujarat	0.360	4	0.431	6	0.479	6
7	Karnataka	0.346	6	0.412	7	0.478	7
8	West Bengal	0.305	8	0.404	8	0.472	8
9	Andhra Pradesh	0.298	9	0.377	9	0.416	10
10	Assam	0.272	10	0.348	10	0.386	14
11	Rajasthan	0.256	12	0.347	11	0.424	9
12	Orissa	0.267	11	0.345	12	0.404	11
13	Madhya Pradesh	0.245	14	0.328	13	0.394	12
14	Uttar Pradesh	0.255	13	0.314	14	0.388	13
15	Bihar	0.237	15	0.308	15	0.367	15
	<b>All India</b>	<b>0.302</b>		<b>0.381</b>		<b>0.472</b>	

*Note:* We have reported the HDI and corresponding rank for only those states for which HDI was estimated in 2001

*Source:* Government of India (2003)

In 1973-74, about 80 per cent of the nation's poor were in rural areas. Thus, there was a reduction in the incidence of poverty slightly faster in rural areas than in the urban areas. In fact, in absolute terms, there were larger numbers of poor people in the urban areas in 1999-00 than in 1973-74, whereas the number of poor in the rural areas declined in 1999-00 relative to the number in 1973-74. One of the factors swelling the ranks of urban poor is the attraction of the urban areas to rural poor as a source of employment. The trends suggest that attention is needed on measures to reduce poverty in urban areas as well as in the rural areas.

**Figure 5. Trends in Poverty: The Head Count Ratio**

Source: World Bank (2000) and extended data from Government of India (2003)

There is also a regional dimension to poverty. The states with low per capita GSDP are also those where incidence of poverty is greater (Table 10). The states of Uttar Pradesh, Madhya Pradesh, Orissa and Bihar are among the states where per capita GSDP is the lowest. It is also in these states that the incidence of poverty is the highest. However, poverty has declined in all the states.

The causes of poverty lie in low productivity of labour in sectors where the poor make their livelihoods. Lack of opportunities to improve their own labour assets reduces the chances of moving up the occupation or income ladder. The anti-poverty programmes have focussed on a variety of approaches.

#### **(a) Rural Poverty Alleviation Programmes**

Poverty issue was essentially a rural problem in the initial years of development planning given the immense proportion of poor in the rural areas. In this context, initial strategies to address poverty focussed on agricultural development, one of the major effects of which were thought to be poverty reduction. Strategies for raising productivity of small and marginal farmers kept in view the concentration of poor in these occupation groups besides the landless labour. The role of poor agro-climatic conditions in influencing poverty was also a factor in policies relating to poverty alleviation.

**Table 10. State Level Incidence of Poverty (Per Cent of Population)**

State	Rural			Urban			Total		
	1993-94	1999-00	Projected 2006-07	1993-94	1999-00	Projected 2006-07	1993-94	1999-00	Projected 2006-07
Andhra Pradesh	15.9	11.1	4.6	38.3	26.6	19.0	22.2	15.8	8.5
Assam	45.0	40.0	37.9	7.7	7.5	4.5	40.9	36.1	33.3
Bihar	58.2	44.3	44.8	34.5	32.9	32.7	55.0	42.6	43.2
Gujarat	22.2	13.2	2.0	27.9	15.6	2.0	24.2	14.1	2.0
Haryana	28.0	8.3	2.0	16.4	10.0	2.0	25.1	8.7	2.0
Himachal Pradesh	30.3	7.9	2.0	9.2	4.6	2.0	28.4	7.6	2.0
Jammu & Kashmir	30.3	4.0	NA	9.2	2.0	NA	25.2	3.5	NA
Karnataka	29.9	17.4	7.8	40.1	25.3	8.0	33.2	20.0	7.9
Kerala	25.8	9.4	1.6	24.6	20.3	9.3	25.4	12.7	3.6
Madhya Pradesh	40.6	37.1	28.7	48.4	38.4	31.8	42.5	37.4	29.5
Maharashtra	37.9	23.7	17.0	35.2	26.8	15.2	36.9	25.0	16.2
Orissa	49.7	48.0	41.7	41.6	42.8	37.5	48.6	47.2	41.0
Punjab	12.0	6.4	2.0	11.4	5.8	2.0	11.8	6.2	2.0
Rajasthan	26.5	13.7	11.1	30.5	19.9	15.4	27.4	15.3	12.1
Tamil Nadu	32.5	20.6	3.7	39.8	22.1	9.6	35.0	21.1	6.6
Uttar Pradesh	42.3	31.2	24.3	35.4	30.6	26.2	40.9	31.2	24.7
West Bengal	40.8	31.9	22.0	22.4	14.9	9.0	35.7	27.0	18.3
India	37.3	27.1	21.1	32.4	23.6	15.0	36.0	26.1	19.3

Source: Planning Commission (2003).

The IV Five Year Plan which began after the drought experience of the mid-1960s, launched the programmes called, Small Farmers' Development Agency (SFDA) Programme, Programme for Marginal Farmers and Agricultural Labourers (MFAL) and Drought Prone Area Programme (DPAP). The two programmes of SFDA and MFAL were merged into a single SFDA programme in the V Five Year Plan. The SFDA was later merged with another major anti-poverty programme called, 'Integrated Rural Development Programme' (IRDP) in 1979.

Besides agricultural development, anti-poverty programmes began to focus on providing employment to the poor in rural areas. Starting in small measures in 1970-71, the programmes assumed significant scale by the V Five Year Plan. A Food for Work programme was launched in 1977. Removal of poverty over a reasonable period of time was a policy stance in the V Five Year Plan. The Minimum Needs Programme (MNP) which also began in 1974 (V Plan) reflected the approach to poverty reduction as one of not merely addressing food requirement of the poor but also other services such as health, education, drinking water, roads etc.

The employment generation programmes made a favourable impact by providing jobs to the poor in the 'lean agricultural season' in rural areas. The VI Five Year Plan included more intensified efforts at poverty reduction. The IRDP was launched in 1976. This programme aimed at evolving an integrated strategy for agricultural development and poverty reduction. The beneficiaries of the programme were the poor farmers, labourers and artisans. The programme came to reflect two main approaches. One was to assist in the generation of self-employment and the other, employment generation. A new National Rural Employment Programme (NREP) launched in 1980 aimed at generating 300-400 million man-days of employment per year in works creating durable community assets in rural areas. Food grains procured by the government under price support programmes for the farmers were used to part-pay the wages under the programme.

Efforts at targeting vulnerable groups for providing support continued to expand with a new scheme called, 'Development of Women and Children in Rural Areas' (DWCRA) launched in 1982. The programme, which still continues aims at facilitating access of poor women to employment, skill upgradation and other support, services. It encourages collective or group action among the poor. The programme also aims at supporting other services such as health, family welfare, child care and shelter for the poor. To give an idea of the coverage, by 1996-97, about 188,000 DWCRA groups had been formed covering 3 million rural women.

In 1989, the NREP and the Rural Landless Employment Guarantee Programme (RLEGP), which had begun in 1983, were merged into a single rural wage employment programme called Jawahar Rozgar Yojana (JRY). The programme envisaged creating 931 million man-days of employment per year. The works supported by the employment programme were to create rural infrastructure. The programme came to be implemented in every village in the country and had specific components for creating housing for the poor and providing open wells for them for irrigation purposes. JRY has now been revamped to focus on creating rural infrastructure. The 'Employment Assurance Scheme (EAS) became the main employment programme in rural areas. While the programme is not targeting poor alone, its operation effectively provides jobs for the poor. It provides 100 days of assured casual manual employment during the lean agricultural season at statutory minimum wages to all persons of age between 18 and 60 years.

The official policies have also attempted to assist the poor in a variety of other ways: The National Social Assistance Programme (NSAP) which was launched in 1995 aims to provide assistance to poor households in the case of old age, death of primary breadwinner and maternity. This is not a poverty alleviation scheme but meets some of the critical needs of vulnerable sections of the society.

On the basis of long experience with the poverty alleviation programmes, there has been a further streamlining of the efforts in the late 1990s. In 1999, the Swarnajayanti Gram Swarozgar Yojana (SGSY) was launched as the self-employment programme for the poor. The programme is based on the self-help groups (SHG) of the poor. The employment programmes were brought under the umbrella of Sampoorna Gramin Rozgar Yojana (SGRY) in 2001. The main strategy of poverty alleviation today is to provide self-employment and wage employment opportunities. Employment is provided through a variety of rural development programmes, which build community assets.

***(a) Urban Poverty Alleviation Programmes***

While provision for basic physical facilities in the urban slums was attempted even in the late 1950s, a programme specifically meant to provide employment to the urban poor began only in 1989. The Nehru Rozgar Yojana (NRY) was aimed at providing wage employment and self-employment for urban poor (this latter component was called "Scheme for Urban Micro Enterprises"). An integrated programme of Swarnajayanti Shahari Rozgar Yojana (SJSRY) was launched in 1997 streamlining various earlier efforts of employment generation and development of slums in urban

areas and it included self-employment and wage employment components. The programme aimed at group action and community involvement in the implementation of the programmes. We provide an overview of the various poverty alleviation programmes in Table 11.

## **6. Inequality of Consumption**

In the various FYPs, the objective of reduction in inequality in the distribution of income and wealth has been re-iterated. But, there are no regular sources of data on income to indicate the trends in income inequality or inequality in the distribution of wealth. We noted earlier the continued and significant regional variations in the average levels of income as reflected in the state level output (GSDP per capita). The only periodic surveys of households relating to their economic status are the surveys of household consumption conducted by National Sample Survey Organisation. Distribution of consumption may by nature be more equitable than distribution of income. In a broad sense, trends in the distribution of households by consumption expenditure are likely to be indicative of the trends in income distribution also.

The trend in estimated measure of expenditure distribution has been summarised in Table 12 for the various years during the period since 1950s. The trends suggest a decline in the measures of inequality between 1953-54 and 1999-2000 in both rural and urban areas. The inequality in rural areas is lower than in urban areas. In fact, in the last two decades of 1980s and 1990s, the rural areas show a decline in consumption inequality while in the urban areas the trend is one of increasing inequality. Clearly, inequality will remain a feature of the economy but policies must aim at providing adequate opportunities for growth to all.

## **7. Employment**

Generation of employment opportunities for the growing labour force is among the main objectives of development policy. This is consistent with the objective of reducing poverty in the sense that poverty is the result of under-employment or low-productivity employment. Generation of more productive employment is also, therefore, an important aspect of policy. A number of government policies have an impact on employment. Although the government has a number of programmes meant to generate employment for the poor, other policies relating to economic growth, labour market regulation and the size of the public sector employment also affect employment.

**Table 11. Some Major Programmes Aimed at Providing Relief to the Poor**

Focus	Programmes	Approach
<b>Rural Areas</b>		
1. Agriculture related incomes of the poor.	Small Farmers' Development Agency (SFDA) and Marginal Farmers and Agricultural Labour (MFAL)	Credit and subsidy for agricultural inputs; livestock enterprises to supplement income; activities to benefit the selected poor households. The programmes assisted a population of about 12 million.
2. Access to basic services	Minimum Needs Programme (1974-79); Basic Minimum Services (1979-96); Pradhan Mantri Gramodaya Yojana (2000-01 onwards)	Subsidised or free services in elementary education; primary health care, electrification, roads, housing
3. Building community assets and infrastructure	Rural Works Programme (1970-71); Food for work (1977-79); National Rural Employment Programme (1981-89); Jawahar Gram Samrudhi Yojana (1999 onwards); Pradhan Mantri Gram Sadak Yojana (2000-01 onwards)	Creating community assets such as school buildings, roads, irrigation/ drainage works; provide wage employment to poor and persons affected by natural calamities.
4. Self-employment opportunities	Integrated Rural Development Programme (IRDP) 1978-79 to 1999-2000	Credit and subsidy to the poor households for improving agricultural productivity and incomes; the programme also moved away from individual beneficiaries to group approach to poverty alleviation.
4. Self-employment opportunities (continued)	Training of Rural Youth for Self-employment (TRYSEM) (1979 to 1999; now merged with SGSY)	Provide opportunities to upgrade/ obtain traditional skills of poor youth and assist in self-employment under IRDP.
	Development of Women and Children in Rural Areas (DWCRA) (1983 to 1989)	Improve living conditions of women and children through opportunities for self-employment and provision of basic social services.
	Supply of Improved Tool kit to Rural Artisans (SITRA) (1992 to 1999; now merged with SGSY)	Rural artisans/craft persons supplied with improved hand tools with 10 per cent subsidy
	Swarna Jayanti Gram Swarozgar Yojana (SGSY) (1999 to present)	Promotion of Self-Help Groups for the poor; training and capacity building programmes; providing income generating assets.

<b>Focus</b>	<b>Programmes</b>	<b>Approach</b>
5. Employment	Rural Landless Employment Guarantee Programme (RLEGP) (1983 to 1989) Jawahar Rozgar Yojana (JRY) (1989 to 1999)	Providing guarantee of employment to at least one member of a landless household for up to 90 days in a year in works developing infrastructure.
	Employment Assurance Scheme (EAS) (1993 to present)	Providing manual work in the lean agricultural season at statutory minimum wage rate (similar in nature to RLEGP above)
	Sampoorna Gramin Rozgar Yojana (SGRY) (2001 onwards)	This integrates JRY and EAS
6. Social Assistance to the Poor	National Social Assistance Programme (NSAP) (1995 onwards)	Financial assistance to the poor in the case of old age, death of primary breadwinner and maternity
	The Antyodaya Anna Yojana (2001 to present)	Providing foodgrains at significantly subsidised rate to the poor.
	The Annapurna Scheme (2000 onwards)	Financial assistance to senior citizens
<b>Urban Areas</b>		
7. Employment	Nehru Rozgar Yojana (1989-1997)	Employment to urban unemployed and under-employed through wage employment and assistance to setting up micro enterprises. Wage employment for the poor
	Prime Minister's Integrated Urban Poverty Eradication Programme (PMIUPEP) (1995-97)	
8. Community Assets and Basic Social Services	National Slum Development Programme (1996-97 onwards)	Providing physical and social amenities in the slum areas.
	Urban Basic Services for the Poor (1992-97)	Focusing on community organisation, mobilisation and employment to provide basic services.
9. Self-employment	Swarna Jayanti Shehar Rozgar Yojana (1997 onwards)	Assistance to the poor in setting up gainful self-employment
10. Housing	Valmiki Ambedkar Awas Yojana (2000-01 onwards)	Shelter for the poor

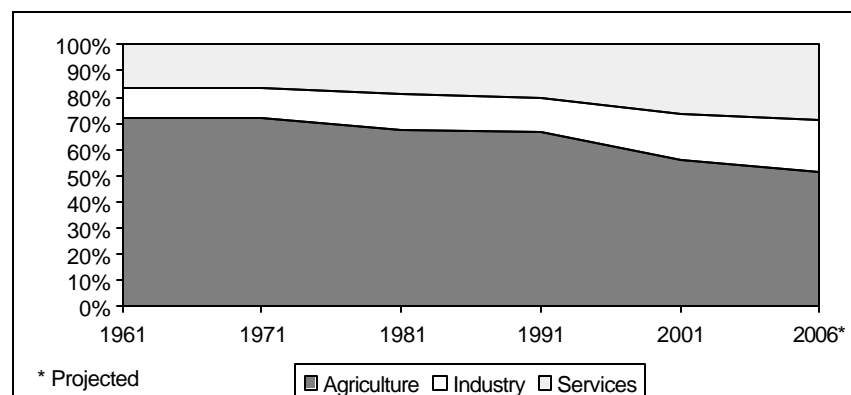
*Note:* This summary is based on various FYP documents.

**Table 12. Trends in Consumption Inequality**

Lorenz Ratio of Consumption Expenditure Distribution		
Year	Rural	Urban
1953-54	0.334	0.381
1954-55	0.350	0.390
1955-56	0.344	0.368
1956-57	0.332	0.394
1957-58	0.334	0.359
1958-59	0.340	0.348
1959-60	0.314	0.357
1960-61	0.321	0.348
1961-62	0.313	0.357
1963-64	0.297	0.360
1964-65	0.294	0.349
1965-66	0.297	0.339
1966-67	0.293	0.337
1967-68	0.291	0.332
1968-69	0.305	0.329
1969-70	0.293	0.340
1970-71	0.283	0.327
1973-74	0.299	0.341
1974-75	0.276	0.301
1977-78	0.336	0.344
1983-84	0.297	0.325
1987-88	0.298	0.354
1993-94	0.282	0.339
1999-2000	0.258	0.341

*Source:* Kapila (1999); Planning Commission (2001)

At the sectoral level, agriculture has been the largest employer of labour force in the country. In 1961, about 71 per cent of the workforce was engaged in agriculture as cultivators and labourers. There has been a gradual decline in the share of agriculture in total employment over the years (Figure 6). The decline in the share of agriculture in total employment from 71 per cent in 1961 to 56 per cent in 2001 is offset by a rise in the share of services from 17 per cent in 1961 to 26 per cent in 2001. The share of industry rose from 12 per cent in 1961 to 18 per cent in 2001. The Planning Commission projects continuation of these trends into the X Plan period. By 2006, the share of agriculture is expected to decrease to 51 per cent whereas the shares of industry and services to rise to 20 per cent and 29 per cent, respectively.

**Figure 6. Trends in the Structure of Employment (Per Cent Shares)**

Source: Government of India (2003); Planning Commission (2003)

The projected share of agriculture in total employment in 2006 is 51 per cent if the targeted growth rates in the X FYP are achieved. The share of services has been projected to go up to 29 per cent by 2006 from the current levels of about 26 per cent. Some features of employment growth have been presented in Tables 13 and 14.

**Table 13. Estimated Workforce (Employment in Million)**

Year (Beginning of period)	Organised	Public Sector	Private Sector	Organised	Unorganised	Total
1961	12.1	7.0	5.0		176.6	188.7
1971	17.5	10.7	6.8		162.9	180.4
1981	22.9	15.5	7.4		221.7	244.6
1991	26.7	19.1	7.7		287.4	314.1
2001	27.8	19.1	8.7		352.9	380.7

Source: Government of India (2003).

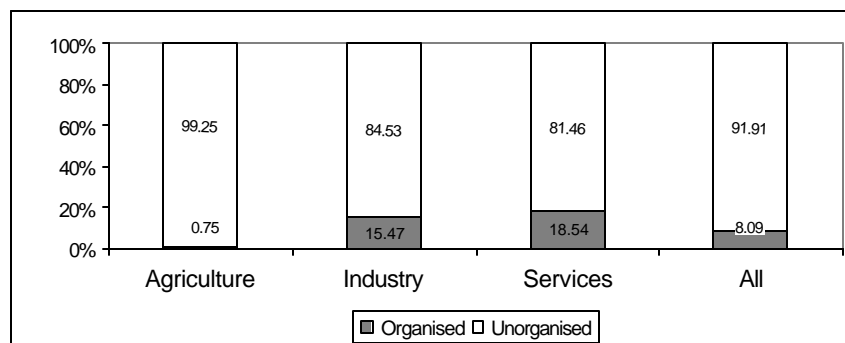
A major dichotomy in the labour market in India is between 'organised' and 'unorganised' sectors. The 'organised sector' has greater protection under labour laws and hence, workers employed here earn better wages and generally, enjoy other benefits such as nominal wages that are linked to overall inflation rate. However, only about 8 per cent of the total workforce in the country is in the 'organised sector' (Figure 7).

**Table 14. Growth of Population, Labour Force and Employment: Per Cent Per Year**

Period	Population	Labour Force (Age group of 15-59 Years)	Employment
1961-1971	2.24	1.99	-0.45
1971-1981	2.24	1.83	3.09
1981-1991	2.15	1.90	2.53
1991-2001	1.95	3.79	1.94
2001-2006	1.63	1.80	2.70

*Note:* Projections for 2006 are based on X FYP (employment growth assumes policy changes and annual growth rate of 8 per cent in real GDP)

*Source:* Government of India (2003); Planning Commission (2003); Registrar General (1991a and b)

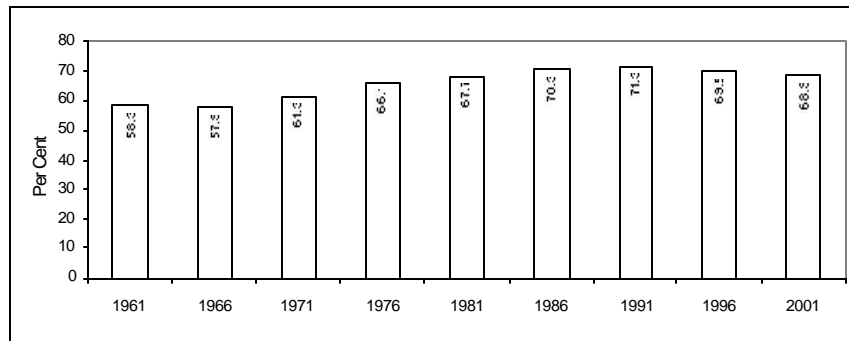
**Figure 7. Distribution of Employment (Per Cent Shares of Organised and Unorganised Sectors: 1999-2000)**

*Source:* Government of India (2003)

Taking out agricultural employment, which is largely in the unorganised sector, the organised sector accounts for 20 per cent of the non-agricultural labour force in the country today.

Public sector is the major component of the 'organised' sector. From a high of 72 per cent, the share of public sector in the organised sector employment has declined a little to 69 per cent in 2001. Although the role of public sector in providing public goods to the society will increase in the future, its presence in other commercial activities is expected to decrease (Figure 8).

**Figure 8. Share of Public Sector in Organised Sector Employment (Per Cent)**



Source: Government of India (2003)

## 8. Sustainability of Progress

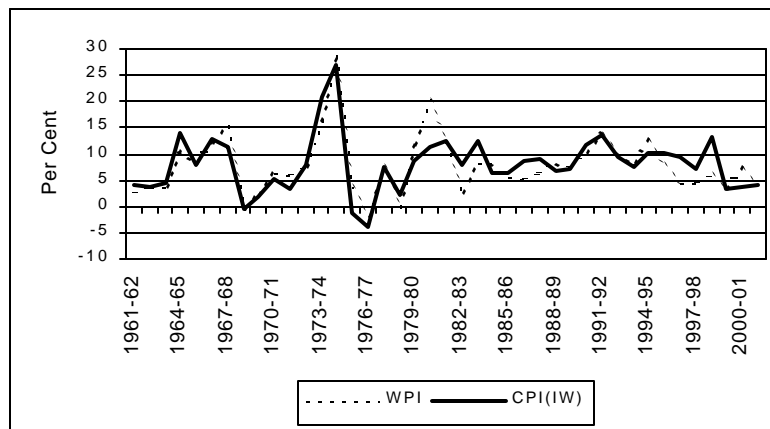
The sustainability of economic growth and development has been constantly emphasised in the planning process. Focus in the initial years of planning remained on issues such as raising the investment and saving rates to sustain overall economic growth, achieving regional balance in growth to ensure broad-based support for the development programmes, and attention to the progress of socially and economically backward groups to ensure the sharing of fruits of development by many. However, concern towards the optimal use of natural resources such as land, water and mineral resources remained high in the policy agenda. In the VI FYP, environmental concerns found a place among the explicit objectives. Since then there has been greater awareness in the policies on the need to preserve and improve environmental quality and not allow its degradation in the development process. To facilitate in discussion, we consider threats to sustainability of development process and measures to deal with these vulnerabilities under two broad categories of economic vulnerabilities and vulnerabilities relating to natural resources and environment.

### (a) *Economic Vulnerabilities*

Economic growth at a rapid pace was sought to be achieved with the active policies of public investment. Financing public investment required combinations of tax and borrowing measures. The need for higher government expenditure and the consequent resource mobilisation measures began to affect adversely from time to time the macro-economic stability as reflected in periodic high inflation rates, large current account imbalances

and high levels of public debt. Although, inflation rates (CPI) of 5-10 per cent have been normal in most of the years between 1950-51 and 2002-03, there were a number of years when inflation rate exceeded 10 per cent (Figure 9). Both consumer prices and wholesale prices display similar trends with the WPI based inflation rate showing larger variations.

**Figure 9. Trends in Inflation: Per Cent Change in Consumer Price Index for Industrial Workers (CPI(IW)) and Wholesale Price Index (WPI)**



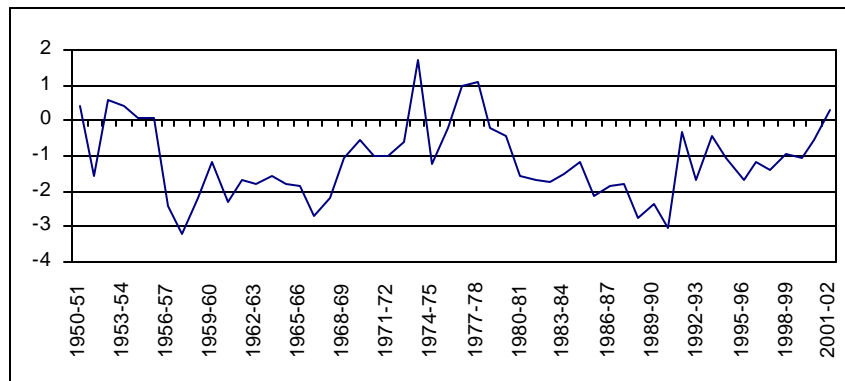
Source: Chandhok (1990a) and updated from RBI (2001)

A characteristic of inflation rates in the period since 1980-81 is the relatively milder fluctuations. Although not at hyper-inflation levels, even an inflation rate of 10 per cent leads to severe strains on the economy. Rise in food prices and prices of essential commodities causes greater hardship to the poor. A second barometer of the vulnerability of the economy to small changes in the economic environment is the level of current account deficit. A deficit is a common feature of the external account for India (Figure 10). Financing the current account deficit through external borrowing was always a challenge for the Indian policy makers during the period when India was pursuing an import substitution policy. The rise in CAD to 3 per cent of GDP in 1991 led to a crisis and the response was a major overhaul of external trade and finance policies. There was a rapid improvement in the CAD relative to the pattern seen in the earlier episode following the crisis of the mid-1950s.

Clearly not all macro-economic instability was due to government spending or resource mobilisation policies. External events such as sharp oil price hikes, wars or shocks such as drought and floods also caused

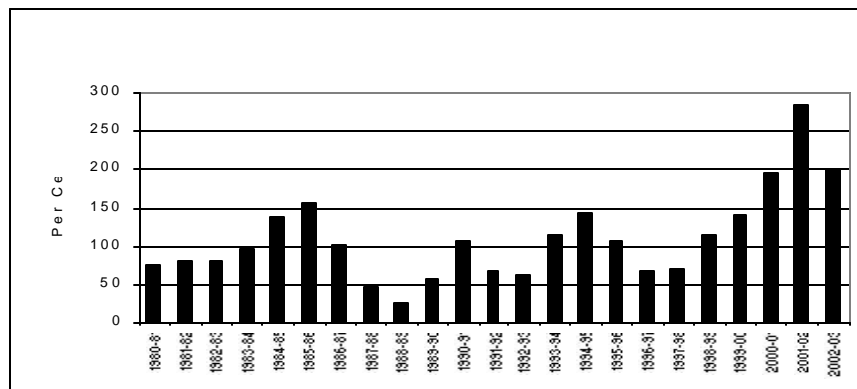
disruption of markets, scarcities of goods and high inflation. On the critical issue of stability in the supplies of food, attention was given to raising the level of food grain production and building stock of grains with the government as a buffer against scarcities induced by droughts or such short-term adversities. The government stock of food grain has been used to supply grain at a subsidised price to the consumers, increasingly by targeting the poor households for these supplies.

**Figure 10. Trends in Current Account Deficit (Per Cent of GDP)**



Source: RBI (2001) and updated from Government of India (2003)

**Figure 11. Food Grain Stock (End of March) as Per Cent of PDS Off-take of the Previous Year**

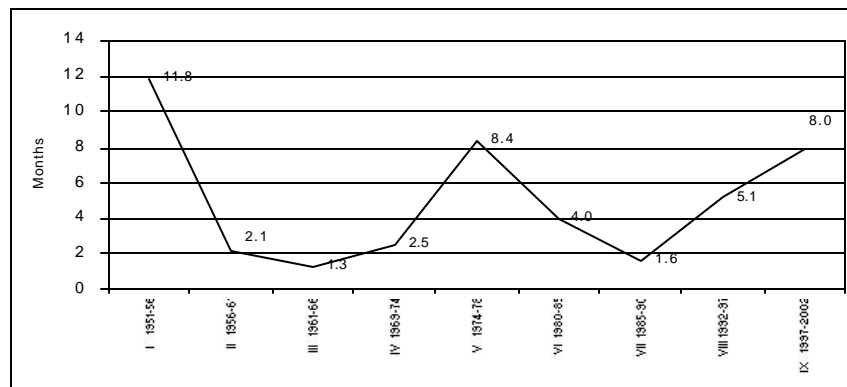


Source: RBI (2001) and updated from Government of India (2003)

The government stocks of foodgrain are today at a record level of about 50 million tonnes which is almost three times the requirement of PDS (Figure 11). The supply of grain through the public distribution system is about 15 million tonnes per year. Even in a year of severe drought in 2002-03, the foodgrain prices remained subdued in the market due to the large stock of grains with the government.

The balance of payments has always remained a critical concern for the policy makers in sustaining the growth momentum. Exports lagged behind imports, which supplied critical inputs such as petroleum crude and petroleum products. The receipts from services exports including IT related services have contributed to the strength of external accounts position. The macro-economic crisis of 1991 was precipitated by the balance of payments crisis. In response, India launched a series of wide ranging programmes of economic reforms of which trade liberalisation was a major part. Several restrictions on international trade were removed and foreign investment regulations were liberalised. Exports received a push with the liberalisation of foreign exchange market and a devaluation that accompanied. Foreign exchange reserves began to rise with the foreign exchange receipts registering marked increases in the 1990s. The rise in foreign exchange reserves to comfortable levels is illustrated in Figure 12. The forex reserves by the end of 2003 had crossed \$100 billion.

**Figure 12. Foreign Exchange Reserves as Months of Import Cover: End of Each Plan Period**

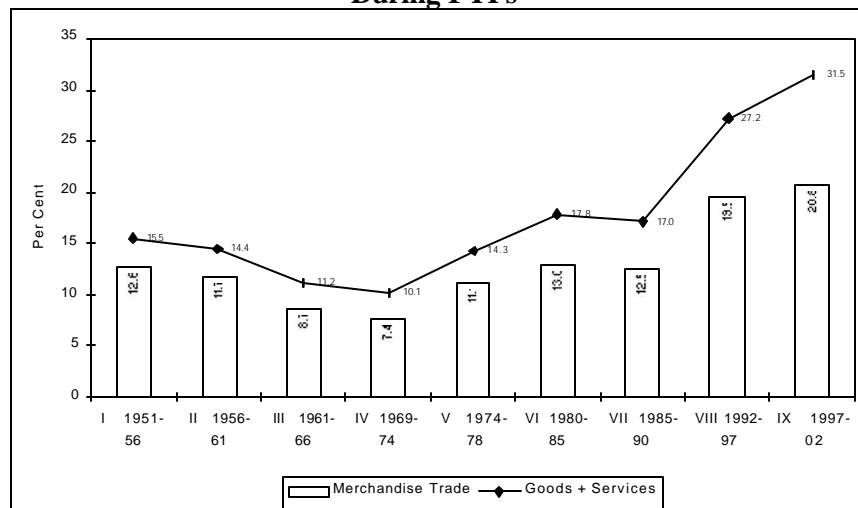


Source: RBI (2001)

There has been a steady opening up of the Indian economy over the years with the pace accelerating in the 1990s. As shown in Figure 13, merchandise trade as a proportion of total GDP has doubled in the 1990s while the increase was less sharp in the previous period. The rise in total trade, goods plus services, has been even more imperative during the IX and X FYP periods. The liberalisation of trade policies has helped in this expansion which has been further strengthened by increasing globalisation trend around the world.

A major cause of the macroeconomic crisis was the unsustainability of the government's fiscal policies. The central government's fiscal position had reached an unsustainable point with much of its borrowing necessitated by debt servicing obligations. There was an urgent need to re-orient the fiscal position, reform revenue and expenditure policies. The fiscal position of the government as a whole (centre plus states) continues to be a point of concern. The gross fiscal deficit of the central and state governments remained close to 10 per cent of GDP even in 2002-03 (Figure 14). This is greater than the levels seen in 1990 which marked the onset of the macroeconomic crisis in 1991. The large deficits have made maintaining developmental expenditure levels more difficult. The share of non-development expenditures which include items such as interest payments on past loans has been rising (Figure 15).

**Figure 13. Openness to Trade: Ratio of Trade to GDP (Per Cent) During FYPs**



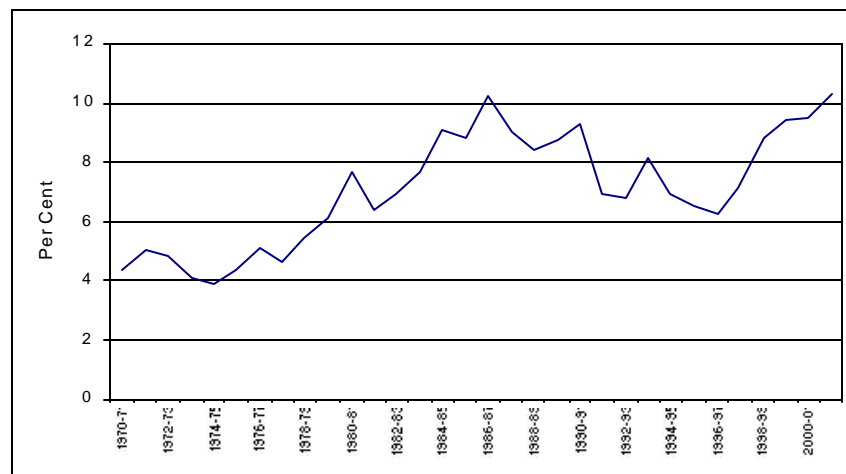
Source: RBI (2001) and updated from Government of India (2003)

The government has responded by focusing on areas where markets are less likely to be adequate and allow market mechanisms to deliver economic growth more efficiently. The VIII Five Year Plan noted that market mechanism is inadequate for protecting environment, forests and ecology and equally unable to give guidance about the use of scarce resources like rare minerals, land and water. The VIII FYP also points out that planning still has a large role to play and that planning is needed for creating social infrastructure and for human development. Market mechanism may be able to bring equilibrium between demand (backed by purchasing power) and supply but it will not be able to balance the “need” and the “supply”. These roles assigned to the public sector require continued need for resources for such investments. This need makes it imperative for the government to maintain a level of fiscal balance that is sustainable.

***(b) Vulnerabilities Relating to Natural Resources and Preservation of Environment***

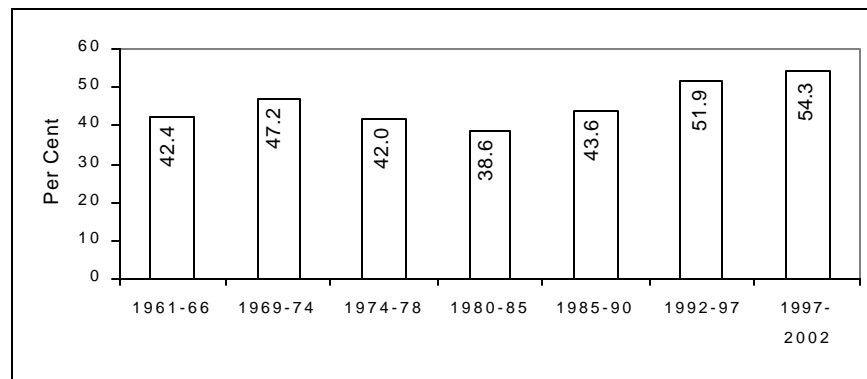
In the context of the concerns relating to environment, the VI FYP points to a clear direction. The VI FYP, launched in 1980, for the first time, made environmental protection as one of the explicit objectives of a Five Year Plan. One of the objectives of this five year plan was to bring about harmony between the short and the long-term goals of development by protection and improvement of ecological and environmental assets.

**Figure 14. Trends in Gross Fiscal Deficit as Percentage of GDP for Centre and States**



Source: NIPFP (2002); RBI (2001)

**Figure 15. Rising Non-Development Expenditure Shares (Per Cent): Centre and State Governments**



Source: Government of India (2002a)

The volatile prices of petroleum sector in the international markets were also assuming importance at this time. The VI Five Year Plan also proposed speedy development of indigenous sources of energy, along with conservation and efficiency in energy use. In the VII FYP, which began in 1985, greater attention was shown towards policies concerning the use of natural resources and the state of the environment. It argued for a judicious blend of economic and environmental concerns to inform all development programmes in the future if development is to be sustainable over the long-run.

The VII Five Year Plan emphasised 'optimal use' of mineral resources, ocean resources, energy and forest resources rather than merely focussing on exploitation of these resources for more growth. It drew attention to the linkage between the state of environment and poverty in noting that the environment was under severe threat from the pressure generated by population growth, poverty and misuse/unplanned use of natural resources. The need to incorporate environmental factors and ecological imperatives into the design of all developmental projects from the very commencement of their plans was highlighted. The VIII FYP, re-iterating the importance of preserving environment, looked to decentralised approach to the problem as it required active participation by the people and programmes suited to local conditions. It pointed to the need for accelerating the cleaning of important rivers in the country.

The IX FYP proposed social mobilisation and participation of people at all levels to ensure environmental sustainability of development process.

It endorsed the approach under the United Nations Conference on Environment and Development and sought a synergy between health, environment and development. The IX Plan laid stress on evolving methodologies for natural resource accounting to enable informed decisions on development programmes with respect to their impact on the wealth of natural resources in the country (Planning Commission, 2000). At the practical level, the plan proposed correcting the under-pricing of natural resources. To highlight the link between poverty and environmental degradation, the IX FYP proposed assured employment of 100 days in the lean agricultural season under the Employment Assurance Scheme (noted earlier under the poverty alleviation programmes) under which projects of infrastructure development would be taken up in the rural areas. The X FYP is more categorical in its assessment of inadequate attention to environment and ecology in the past development efforts. It recognises the threat to nutritional security and health arising from the environmental degradation that has taken place. It warns about the dangers of rise of pollution related disease burden unless remedial measures to check (urban) pollution are undertaken immediately.

### ***Land Resources***

Concerns relating to the improvement of land resources have been echoed in different policy statements over the years. Drawing attention to the issues relating to pressure on land resources, the VII FYP noted that about 105 million hectares of cultivable lands and 8 million hectares of non-forests and non-agricultural lands are subject to widespread soil erosion. In addition, 43 million hectares of area was said to be degraded through waterlogging, salinity, alkalinity, ravines and shifting cultivation. The VII FYP noted that an estimated 6 billion tonnes of topsoil are lost annually through erosion and degradation, along with plant nutrients ranging between 5.37 and 8.4 million tonnes. Arresting further degradation by proper land use and soil conservation and bringing back to health the degraded soil to support a highly productive agriculture was stated to be the primary concern of development efforts. Till 1979-80, an area of about 23.4 million hectares was treated by various soil conservation measures. Against the VI FYP target of covering additional 7 million hectares under soil and water conservation measures, the achievement was 6 million hectares. Thus, by the end of VI FYP, the area treated under soil and water conservation measures was 29.4 million hectares. About 80 million hectares out of the total net cultivated land of 140 million hectares is estimated to be suffering from varying degrees of soil degradation. According to the assessment in

the VII FYP reclamation and development of about 40 million hectares was possible but needed huge effort to achieve this possible target.

The VIII FYP provided more discussion relating to the state of use of natural resources. The per capita availability of land is declining. With the assumed rate of population growth it will decline to 0.3 hectares by 2007 from 0.89 hectares in 1950. For the animal population the decline is from 1.1 hectares in 1995 to 0.6 hectare by 2007. Even with efforts to reclaim the wasteland and the land affected by salinity, alkalinity and water logging the upper limit for net sown area is 141 million hectares. The VIII FYP points to the fact that on the average floods affect an area of about 8 million hectares annually. Out of this area, about 40 per cent is cropped area. The total net cropped area prone to water stress (moisture scarcity) and drought is about 64 million hectares. The current estimates are that about 16.35 tonnes of topsoil is lost per hectare per year.

The Technical Committee on Co-ordination of Agricultural Statistics, set up by the Ministry of Food and Agriculture, recommended a nine-fold classification of land use for the country. Table 15 presents the land utilisation pattern in India since 1950-51 based on this nine-way classification.

Agriculture is the largest of land use categories in the country. The available estimates show that the net sown area in the country has increased from 118.75 million ha during 1950-51 to about 142 million ha during 1997-98. This constitutes an increase from 41.77 per cent to 46.58 per cent of the reported land area. Similarly, the gross cropped area, which includes area sown more than once and irrigated area have also shown upward trend. The gross cropped area, which was 131.89 million ha during 1950-51, increased to 190.76 million ha during 1997-98. The area sown more than once, net irrigated area and gross irrigated area have more than doubled during the same period. While the area sown more than once, which indicates intensity of land use increased from 13.14 million ha to 48.74 million ha during the above period. The increase in net irrigated area was from 20.85 million ha to 54.57 million ha during 1950-51 to 1997-98 whereas the corresponding figures for gross irrigated area were 22.56 million ha to 72.78 million ha.

Forests constitute another important land use category. The recorded forest area in the country was 40.48 million ha during 1950-51 accounting for 14.24 per cent of the total land area for which land use statistics are available. The area under forests increased to 68.86 million ha during 1997-98 (22.58 per cent).<sup>2</sup>

**Table 15. Area under Different Land Use Categories in India  
(Million Hectares)**

Land use category	1950-51	1960-61	1970-71	1980-81	1990-91	1997-98
1. Geographical area	328.73	328.73	328.73	328.73	328.73	328.73
2. Reporting area	284.32	298.46	303.8	304.15	304.87	304.92
i. Forests	40.48	54.05	63.91	67.47	68.00	68.86
ii. Not available for cultivation	47.52	50.75	44.64	39.62	40.90	41.56
a. Non- agricultural uses	9.36	14.84	16.48	19.66	21.20	22.53
b. Barren and uncultivable land	38.16	35.91	28.16	19.96	19.70	19.03
iii. Other cultivated land	48.45	37.94	35.06	32.31	30.50	28.36
a. Permanent pastures and grazing land	6.68	13.97	13.26	11.97	11.80	10.91
b. Miscellaneous tree crops and groves	19.83	4.46	4.30	3.60	3.70	3.57
c. Cultivable wasteland	22.94	19.21	17.50	16.74	15.00	13.88
iv. Fallow land (a+b)	28.12	22.82	19.88	24.75	23.40	24.12
a. Fallow land other than current fallow	17.44	11.18	8.76	9.92	9.60	9.76
b. Current fallow	10.68	11.64	11.12	14.83	13.80	14.36
v. Net sown area (vi-iii)	118.75	133.20	140.30	140.0	142.20	142.02
vi Gross cropped area	131.89	152.77	165.8	172.63	185.50	190.76
vii. Area sown more than once	13.14	19.57	25.52	32.63	41.62	48.74
viii. Net irrigated area	20.85	24.66	31.10	38.72	45.14	54.57
ix. Gross irrigated area	22.56	27.98	38.19	49.78	59.64	72.78

*Source:* Government of India (2001b).

Land not available for cultivation although showed an increasing trend during 1950-51 to 1960-61 it has declined considerably since 1960-61. The area under this category shows a marginal increase since 1980-81. However, there are two distinct opposite trends within this category. The category of 'barren and uncultivable land' has declined over the years whereas the land under non-agricultural uses comprising of land occupied by buildings, roads and railways, or under water, like rivers or canals or land put to any other uses other than agricultural has shown a consistent upward trend. From a mere 9.36 million ha (3.29 per cent) during 1950-51, it has increased to about 22.53 million ha (7.39 per cent) during 1997-98.

The strategy for efficient use of land is to optimise its productivity and preserve its quality over time. Increasing forest cover, reducing land degradation, reclaiming wastelands are now becoming part of such a strategy in the policies.

### Land Degradation

Over the years, land resources in India have suffered from different types of degradation due to both biotic and abiotic causes. India, which has only 2.4 per cent of the world's geographical area, supports over 16 per cent of the population in the world. The X FYP noted that, India has 0.5 per cent of the world's grazing area but has over 18 per cent of world's cattle population. Intensive agricultural practices, which rely heavily on water, chemical fertilisers and pesticides, cause problems of water logging and salinity. In order to increase agricultural production even marginal lands are put under cultivation. Although precise estimates of degraded lands are yet to be determined, Table 16 provides some information about the extent of soil degradation in India.

Out of the total geographical area of about 328.7 million ha almost 187.8 million ha (57 per cent) are under different types of degradation. Out of these, about 137.9 million ha are moderately degraded. Water run-off is a major cause of soil degradation. Almost 45.3 per cent of the total degradation is due to water erosion.

Water and wind erosion result in loss of topsoil, terrain deterioration and deformation. Chemical deterioration is also another major type of soil degradation. Salinisation and loss of nutrients of slight to moderate degree are reported. Water logging, which results in physical deterioration, is another major type of degradation of soil in India. Due to widespread degradation vast areas are considered as wastelands. However, estimates of wastelands differ considerably due to definitional inconsistencies. As per the estimates given in Wasteland Atlas of India 2000, 63.9 million hectares or almost 20 per cent of the geographical area are treated as wastelands (Table 17). It may also be noted that some of the most degraded lands in the country are common property resources.

**Table 16. Extent of Soil Degradation (Human Induced) by Type of Degradation (in Million Hectares)**

Degradation type	Degree of Degradation				Total	Area affected
	Slight	Moderate	Strong	Extreme		
Water Erosion	27.3	111.6	5.4	4.6	148.9	45.3
a. Loss of topsoil	27.3	99.8	5.4	-	132.5	40.3
b. Terrain deterioration	-	11.8	-	4.6	16.4	5.0
Wind Erosion	0.3	10.1	3.1	-	13.5	4.1
a. Loss of topsoil	0.3	5.5	0.4	-	6.2	1.9
b. Loss of topsoil/terrain deterioration	-	4.6	-	-	4.6	1.4
c. Terrain deformation/over blowing	-	-	2.7	-	2.7	0.8
Chemical deterioration	6.5	7.3	-	-	13.8	4.2
a. Loss of nutrient	3.7	-	-	-	3.7	1.1
b. Salinisation	2.8	7.3	-	-	10.1	3.1
Physical deterioration	-	-	-	-	116.6	3.5
Water logging	6.4	5.2	-	-	11.6	3.5
Total (affected area)	36.8	137.9	8.5	4.6	187.8	57.1
Land not fit for agriculture						
stable terrain					18.2	5.5
Under natural condition					31.2	9.8
Total Geographical Area of India					328.7	100

Source: Government of India (2002b).

#### Land Conservation Efforts in India

Several measures have been adopted in India to conserve the land resources. Both Central and State governments have launched programmes aimed at land and soil conservation. Sharma and Shukla (1990) provide a brief summary of the government initiatives for wasteland development in India. The Central government constituted 'The Wasteland Surveys and Reclamation Committee' as early as 1959 to make a survey of degraded lands. In 1963, the Planning Commission set up a Committee on Natural Resources under its Natural Resources Division to study wastelands including Saline/Alkaline and waterlogged lands and in 1965 launched a programme for survey and reclamation of ravines in India. State Land Use Boards were set up in 1974 in various states for the purpose of determining

**Table 17. Classification of Wastelands**

Category	Area (Million hectares)	Per Cent of Total Geographical Area
Gullied and or ravinous land	2.1	0.65
Land with or without scrub	19.4	6.13
Waterlogged and marshy land	1.7	0.52
Land affected by salinity/alkalinity – coastal/ inland	2.0	0.65
Shifting cultivation area	3.5	1.11
Underutilised / degraded notified forest land	14.7	4.44
Degraded pastures / grazing land	2.7	0.82
Degraded land under plantation crop	0.6	0.18
Sands-inland / coastal	0.5	1.58
Mining/ industrial wastelands	0.1	0.04
Barren rocky/stony waste/ sheet rock area	6.5	2.04
Steep sloping area	0.8	0.24
Snow covered and / or glacial area	5.6	1.76
Total wasteland area	63.9	20.17

*Note:* 120,849.00 sqkms in Jammu and Kashmir is not mapped and hence, not considered for calculating the percentage.

*Source:* Government of India (2000b)

and monitoring the appropriate land-use in integrated manner. An autonomous body called the Society for the Promotion of Wasteland Development whose main objective was afforestation through social forestry was set up in 1982. Later, in 1983, the National Land Board was set up. Besides these, an All India Soil Survey was conducted for identifying and suggesting measures for promoting the health of wastelands in different parts of the country. The National Land Resources Conservation and Development Commission was set up in 1983 with the objective of optimal development of wastelands in the country. Later on, the National Land Use Board was reconstituted as the National Land Use and Wasteland Development Council (NLWDC) with the twin objectives of proper land use and development of wastelands. Two separate bodies, viz., the National Land Use and Conservation Board (NLCB) and National Wastelands Development Board (NWDB) were set up in 1985. The council is the highest policy planning and coordinating agency for all issues concerning the health and scientific management of the country's land resources. The NLCB involves in the formulation of National Policy and Perspective Plan for conservation, management and development of

land resources of the country, taking into account appropriate land-use and soil capability and other factors. NWDB is the nodal policy planning and coordinating agency for utilisation of wastelands for sustainable development. The principal aim of the NWDB is the utilisation of wastelands through a massive programme of afforestation and tree planting.

Besides the above, several poverty alleviation measures also had an impact on land conservation efforts in India. For example, the Drought-prone Area Programme (DPAP) introduced in 1973-74 was the first major programme aimed at soil and moisture conservation in drought-prone areas. Currently, it is being implemented in 971 blocks across 16 states (X Plan). The Desert Development Programme (DDP) introduced in 1977-78 and being implemented in 7 states aims at restoring the ecological balance, conservation of soil and water, and arresting of formation of deserts through shelter belt plantation. The Integrated Watershed Development Programme (IWDP) started in 1989-90 is yet another programme for developing government wastelands and CPRs, based on village/micro watershed plans. The National Watershed Development Project for Rainfed Areas (NWDPR) was initiated in 1990-91 with the twin objectives of improving agricultural production in rainfed areas and to restore ecological balance. The Technology Development Extension and Training (TDET) scheme was launched in 1993-94 and hundred per cent Central grants are provided for projects relating to demonstration of technologies for development of wastelands. Likewise, the Investment Promotion Scheme (IPS) launched in 1994-95 promotes participation of the corporate sector and financial institutions in the development of non-forest wastelands. Measures are also taken to control shifting cultivation and settle the jhumia families on a permanent basis. The Watershed Development Programme in Shifting Cultivation Areas (WDPSCA) was first launched during V plan as a pilot project and was revived in 1994-95 for the north-eastern states. A Watershed Development Fund (WDF) was set up in 2000-01 for channelising greater resources for rainfed areas.

Since the extent of degradation of land and area under wasteland in the country is a matter of conjecture, it is proposed to set up a National Management Information System during the X Plan. The Plan also proposes to formulate a National Policy on Land Resources Management for optimum management of land resources to meet the socio-economic demands. It is also expected to promote an institutional framework that would encourage productive utilisation of land. The X Plan also highlights the need to identify and assess 'hot spots' of land degradation so that they get maximum benefits from the limited resources available.

### ***Water Resources***

The concern on the optimal use of water with respect to its conservation was less conspicuous in the initial stages of economic development planning as the emphasis was on the development of water services for accelerating agricultural growth. The VIII Five Year Plan drew attention to the rising costs of using water and the need to increase productivity of water harnessed through irrigation. Discussing the problem of water scarcity, the X Plan notes that unless urgent steps are taken, water, for both drinking and irrigation purposes, may become the single most important problem by the end of the decade.

Although the endowment of water resources appears to be abundant there are wide variations in the availability of fresh water in India over different regions and over different periods in a year. The pressure on the available water is increasing due to growing population. India, which has 2.45 per cent of the world's land resources, has roughly four per cent of the world's fresh water resources whereas the country's population is about 16 per cent of the world's population. In 1990, India was ranked at 42<sup>nd</sup> position among 100 countries by per capita water availability (Planning Commission, 2000). The report of the National Commission for Integrated Water Resources Development 1999 provides estimates of water availability in India under strict assumptions and with certain limitations. The estimates of water are made on river basin-wise which are the natural hydrologic units. The water resource of Ganga-Brahmaputra-Meghna basin is estimated at 1200 km<sup>3</sup>, which is 60 per cent of the total water resource flows while the basin occupies 33 per cent of the geographical area. Water resource of west flowing rivers of south of Tapi is estimated as 200 km<sup>3</sup>, which is 11 per cent of the total water resource, whereas the basin occupies only three percent of the geographical area of the country. The remaining 64 per cent of the area has a water resource of only 553 km<sup>3</sup>. The total replenishable groundwater resource is estimated at 432 Km<sup>3</sup>. The total water resource of the country is estimated at 1952.87 km<sup>3</sup>.

Different authorities have provided estimates of the utilisable water, which is the quantum of water that can be withdrawn from its place of natural occurrence. The irrigation commission 1972 placed the country's utilisable quantities at 666 km<sup>3</sup> from surface water. The National Commission on Agriculture estimated the utilisable quantity as 700 km<sup>3</sup>. The Central Water Commission estimated the utilisable surface water in each river basin considering the suitable sites / locations for diversions and storage structures to achieve the ultimate irrigation potential of 76 million ha and to satisfy the

demands of domestic, industrial and other sectors by 2025. Total utilisable flow in the river basins was estimated as 690.31 km<sup>3</sup> which was accepted by the National Commission for Integrated Water Resources Development 1999. Out of the 432 Km<sup>3</sup> of replenishable groundwater 396 Km<sup>3</sup> has been estimated as utilisable. Some estimates of water utilisation are also available. The total withdrawal /utilisation for all uses in the year 1990 was 552 Km<sup>3</sup> or 655 m<sup>3</sup> /person/year (Government of India 1999). Out of the total water utilised in the country irrigation accounted for nearly 83 per cent; followed by drinking and municipal use (4.5 per cent) energy development (3.5 per cent) and industries (3 per cent). Other activities claimed approximately 6 per cent of the total use.

The National Commission 1999 has also estimated water requirement for the years 2010, 2025 and 2050 (Table 18). Water requirement is related to population, demand for food, production of non-food agricultural and industrial items, production of energy and improvement in the quality of life and preservation of ecology and environment. Information on most of the above is inadequate and several strict assumptions have been made for estimating the water requirement.

As per the estimates, the demand for water is likely to increase over the years. Water demand for irrigation has been estimated between 628 Km<sup>3</sup> (Low Demand Scenario) and 807 Km<sup>3</sup> (High Demand Scenario) for the year 2050. Taking into account the norm of 220 litres per capita per day (lpcd) for the urban areas and 150 lpcd for the rural areas the total requirement for domestic use for rural and urban areas has been estimated at 111 Km<sup>3</sup> and 90 Km<sup>3</sup> under the two scenarios by 2050. The water requirement for industrial development is estimated as 81 Km<sup>3</sup> and those for energy and power sector for high and low demand scenarios as 70 Km<sup>3</sup> and 63 Km<sup>3</sup> respectively for the year 2050. The total water requirement of the country has been estimated as 694 to 710, 784 to 850 and 973 to 1180 Km<sup>3</sup> by the years 2010, 2025 and 2050 respectively depending on the low demand and high demand scenarios. Irrigation would continue to have the highest water requirement, between 628-807 Km<sup>3</sup> (or about 68 per cent of total water requirement) followed by domestic water use, including drinking and bovine needs, at about 90-111 Km<sup>3</sup> (or about ten per cent of the total water requirement) in the year 2050. The projected water use per capita per year in the year 2050 would be about 725-750 m<sup>3</sup> as compared to about 650 m<sup>3</sup> at present.

**Table 18. Water Requirement for Different Uses (Quantity in Km<sup>3</sup>)**

Uses	Year 1997-98	Year 2010			Year 2025			Year 2050		
		Low	High	Per cent	Low	High	Per cent	Low	High	Per cent
Irrigation	524	543	557	78	561	611	72	628	807	68
Domestic	30	42	43	6	55	62	7	90	111	9
Industries	30	37	37	5	67	67	8	81	81	7
Power	9	18	19	3	31	33	4	63	70	6
Inland										
Navigation	0	7	7	1	10	10	1	15	15	1
Flood control	0	0	0	0	0	0	0	0	0	0
Environment (afforestation and ecology)	0	5	5	1	10	10	1	20	20	2
Evaporation										
Losses	36	42	42	6	50	50	6	76	76	7
Total	629	694	710	100	784	843	100	973	1,180	100

Source: Government of India (1999)

The problems due to pollution arising from municipal sewage, urban and rural wastes, industrial effluents, chemical fertilisers and pesticides all pose serious threat to the quality of available water. Water quality criteria have been developed for various categories of beneficial uses ranging from drinking water, outdoor bathing, propagation of wildlife and fisheries, irrigation, industrial cooling and controlled waste disposal. The relevant parameters are colour, odour, floatable material, pH, phenols and hydrocarbons. Based on the water quality data generated by the Central Pollution Control Board over the years 13 heavily and 26 medium polluted rivers and 26 medium polluted river's stretches have been identified in the country. The pollutants include dissolved oxygen, bio-chemical oxygen demand and total coliforms. It has been noted that in most of the rivers in India these parameters are not adequate to indicate the overall health of the water body. Groundwater contamination is also a major problem in India.

Groundwater contamination is from two major sources: one, inherent in the form of contamination caused by the very nature of geological formation and the other, caused by human interference. Excess fluoride, excess arsenic and excess iron are due to the very nature of geological formation. The excess application of chemical fertilisers having high amount of nitrogen,

untreated domestic sewage causing biological contamination, discharge of untreated industrial effluents and excess pumping of groundwater in coastal areas leading to brackishness are examples of contamination due to human interference.

Lack of adequate access to safe drinking water by the population, which leads to health hazards, is yet another challenge that India faces. As per the Census of India, if a household has access to drinking water supplied from a tap, hand pump/tube well within or outside the premises, it is considered as having access to safe drinking water. According to Census of India 1991, the coverage of households in India having access to safe drinking water was 62 per cent comprising 81 per cent of urban households and around 56 per cent of rural households. Lack of access to safe drinking water and poor sanitation poses major health risks. The water-borne diseases include hepatitis A, cholera, typhoid, polio, diarrhoea and amoebiasis. Important water associated diseases include malaria, filarial, dengue, polio myelitis, heiminthis and infectious hepatitis.

Realising that water is becoming a scarce commodity efforts are being made to ensure its efficient use. Since irrigation use constitutes a major use of water resources in the country, the need to improve water use efficiency in the existing irrigation projects through modernisation, renovation and upgradation is being recognised. The National Water Management Project (NWMP), an externally aided project, with the objective to improve irrigation coverage and agricultural productivity was implemented during 1987-95. Water Resource Consolidation Projects have been implemented in some states like Haryana, Tamil Nadu and Orissa during the Eighth Plan which envisages the completion of some incomplete major and medium projects and strengthening of institutions on the lines of Participatory Irrigation Management / Irrigation Management Transfer (PIM/ IMT). Some states have revised the water rates according to the National Water Policy 1987. The National Water Policy 1987 says that water rates should be such as to convey its scarcity value to the users and motivate them in favour of efficient water uses. Besides, the rates must be adequate to cover annual maintenance and operation charges and recover a part of the fixed cost. Activities related to the removal of water logging and restoration of saline and alkaline areas in the irrigated commands are included in the Centrally Sponsored Command Area Development Programme. A close integration of water use and land use policies is called for.

Considerable attention is also paid to provide safe drinking water in both rural and urban areas. The National Water Policy 1987 gave priority to

drinking water over other uses. Programmes like Accelerated Rural Water Supply Programme (ARWSP), the Pradhan Manthri Gramodaya Yojana – Rural Drinking Water (PMGY-RDW) is being implemented to provide drinking water to the rural habitations. Considerable success has been achieved in meeting the drinking water needs of the rural population. With an investment of over Rs 34,000 crores, 91.06 per cent of the rural habitations have been fully covered with drinking water facilities and 7.93 per cent are partially covered (Government of India 2003). For urban water supply a similar programme called the Accelerated Urban Water Supply Programme was launched in 1993-94. The programme aims at supplying water to towns with a population of less than 20,000 as per the 1991 Census. The National Water Policy 2002 also emphasises the need for integrated water resources development taking hydrological unit such as drainage basin as a whole or for a sub-basin multi-sectorally taking into account surface and groundwater for sustainable use incorporating quantity and quality aspects. The policy also states the need for adopting non-conventional methods for utilisation of water such as through inter-basin transfers, artificial recharge of groundwater and desalinisation of brackish or sea water, as well as traditional water conservation practices like rainwater harvesting, including roof-top rainwater harvesting.

Efforts are also taken for assessment of water availability and for monitoring the quality of water. The Central Water Commission is maintaining a large network of about 877 hydrological observation stations in the key locations of the river basin systems of India for this purpose. Some of these stations are also engaged in water quality monitoring. The groundwater quality is being monitored by the Central Ground Water Board through a network of 14,995 monitoring stations set up in different parts of the country. The Central Pollution Control Board (CPCB) has a major responsibility of monitoring water quality in various water bodies all over the country. There are also several Acts like the *Water (Prevention and Control of Pollution) Act 1974*, the *Environment Protection Act 1986*, etc., for dealing with matters related to water pollution.

There are also a number of programmes that have been initiated to restore water quality and sustain rivers, lakes and wetlands. The river cleaning programme was started with the launching of Ganga Action Plan Phase I in June 1985, and was followed by Phase II and the National River Conservation Plan covering all major rivers in the country. Similarly, Lake Conservation Programme and Wetland Conservation Programmes were also launched. Considering the regional variations in the availability of water resources

there are also proposals for inter basin transfer of water resources and linking of major rivers.

### ***Fisheries***

India with a coastline of about 8129 kms, 0.5 million km<sup>2</sup> of continental shelf and 2.02 million km<sup>2</sup> of Exclusive Economic Zone (EEZ), is a major marine fish producer, ranking seventh in the world. The warm, fertile inshore waters of India are among the most productive fishing grounds in the world, yielding shrimps, sardines, mackerels and a variety of other marine fish. Inland fisheries such as freshwater and brackish water aquaculture involving mostly shrimp culture and capture fisheries in rivers, estuaries, lakes and reservoirs also are equally rich. It may be noted that both marine and inland fish production in India have increased many fold since 1950-51. The total fish production increased from 0.75 million tonnes during 1950-51 to 5.6 million tonnes by 2000-01 (Table 19). The contribution of fisheries sector to GDP has also increased over the years. The percentage share of fisheries sector to total GDP (current prices) has increased from 0.62 per cent during 1970-71 to 1.38 by 1998-99.

Marine products comprise an important component of the export basket from India. The quantum and value of marine products export from India has increased over the years. The share of exports of marine products increased from 0.74 per cent during 1960-61 to 3.13 per cent by 2000-01 (Table 20).

**Table 19. Fish Production in India (in Million Tonnes)**

Year	Marine	Inland	Total
1950-51	0.53	0.22	0.75
1960-61	0.88	0.28	1.16
1970-71	1.09	0.67	1.76
1980-81	1.56	0.89	2.42
1990-91	2.30	1.54	3.84
2000-01 (Provisional)	2.81	2.85	5.60

*Source* : Government of India 2000c and 2002b

**Table 20. Growth of Marine Products Export from India**

Year	Quantity (Million (Tonnes)	Value (US \$ (Million)	Share of Marine Products to total Exports
1960-61	0.20	10	0.74
1970-71	0.32	40	1.97
1980-81	0.69	274	3.23
1990-91	0.16	535	2.95
2000-01	0.50	1,394	3.13

Source : Government of India (2003)

The area as well as production of fish from aquaculture is also on increase in India since 1980. While the area under brackish water aquaculture increased from a negligible 0.05 million ha during 1980 to about 14.1 million ha by 1999, production increased from 0.20 to 6.68 million tonnes during the same period (Sugunan 1997 and Government of India 2002b).

#### *Fisheries Management*

In India, fisheries are under the control of individual state and governed according to the *Indian Fisheries Act 1927*. The fishermen are required to obtain a licence from the local office of the state fisheries department and follow mesh size and other regulations in fishing which varies across states. Cooperative societies and the state-level fisheries development corporations are also involved in fishing and marketing operations.

India's fisheries policy had aimed at maximizing foreign exchange since early 1960s. The sudden emergence in the 1960s of international markets (particularly in the USA and Japan) for luxury frozen fish (such as prawns, lobsters, and tuna) combined with the pressure of severe balance of payments constraints led the Indian government to actively support the growth of harvesting and processing capacities in places where prawns and lobsters are highly concentrated without considering its impact on the resource stock (Kurien 1978). In order to augment fish production the 'modernisation growth oriented' model of development largely premised on the experience of the more developed countries was adopted. This involved the superimposition of a modern, capital intensive, specialized technology over the largely labour intensive traditional base. The overall fish and prawn harvest started to decline soon and the marine fishery sector started to head towards an ecological crisis (Kurien 1993).

However, it may be noted that marine fishing is very complex since fish stocks fluctuate unpredictably and their population dynamics is not well understood. Therefore, it is difficult to establish clear and predictable connections between fishermen's harvesting behaviour and the state of the resource. Even the signs and causes of depletion are hard to interpret and determine. For example, in Kerala, a marked decrease in total fish landings occurred in the mid 1970s and persisted throughout the 1980s. Small scale fishermen's organizations and activists put the blame for such a decline on the rapacious operations of a sizeable fleet of trawlers which entered the sector by the late 1960s and the early 1970s. The government eventually decided on a seasonal ban on trawling in the early 1990s. Yet, in 1991, due to the abundant presence of pelagic fish species off the coast of Kerala, there has been a sudden and unexpected increase in the aggregate catch which more or less equaled the peak average level attained in 1971-75. The unpredictable nature of fisheries is a major challenge for fisheries management. The fisheries sector also faces problems arising out of the increasing human population in coastal zone, development of industries and ports, discharge of effluents and municipal sewage etc.

In the light of the above, measures have been adopted to increase fish production on a sustainable basis. Besides regulating fishing practices and prohibiting adoption of destructive fishing practices by the fishermen, various measures have been adopted to protect fisheries habitat. Since marine productivity is concentrated in small areas of coral reefs, lagoons, mangroves, etc., it was realized that protecting these habitats under Marine Protected Area would safeguard the vital life support process of the sea and ensure sustained fish production (Philips 1999). Protected marine areas in India comprise of national parks and wildlife sanctuaries declared in coastal wetlands, especially mangroves, coral reefs and lagoons under *Wildlife (Protection) Act 1972*. *Coastal Regulation Zone (CRZ) Act 1991* was enacted by the Government of India to protect the Indian coast from degradation. The CRZ includes ecologically sensitive areas, mangroves, coral reefs area close to breeding ground of fish and other marine life, and Marine Protected Areas.

A working Group constituted by the Ministry of Agriculture in August 1990 had revalidated the fishery resource potential of Indian EEZ at 3.9 million tonnes of which 2.21 million tonnes were within a region of depth up to 50 metres. It is found that the resource within 50 metres depth regions is at present exploited to the optimum level. The resource potential beyond 50 metres is estimated at 1.69 million tonnes. Some of the commercially

important resources under exploited beyond 50 meters depth regions are tuna (2.09 lakhs tonnes), Tunnies (2.42 lakh tonnes), Ribbon fish (2.16 lakh tonnes), Perches (1.25 lakh tonnes) and Cat fish (0.63 lakhs tonnes) (Sugunan 1997).

In 1991, the Government of India modified the deep fishing policy encouraging long lease of fishing vessels and permitting test fishing as prelude to joint venture. The Marine Products Export Development Authority (MPEDA) initiated a number of steps for increasing the fleet strength for exploitation of under exploited resource and for encouraging the existing outrigger trawlers to modify for diversified fishing.

The government also adopted measures to augment inland fish production through intensive aquaculture practices. To augment production through aquaculture and to sustain and increase the exports, an Aquaculture wing was established in the year 1979 to promote aquaculture in coastal brackish water areas. The assistance provided by the aquaculture wing includes conducting surveys to identify suitable sites for farming, technical advice on various aspects of farming and training the farmers, promoting eco-friendly aquaculture etc. The increase in area under aquaculture and production was made possible mainly because of the national efforts which introduced scientific composite fish farming through a network of Fish Farmer's Development Agencies (FFDA). The Ministry of Agriculture launched FFDA during 1973-74 to popularize fish farming. Introduction of improved fish farming technology through FFDA has helped increase the average productivity of the ponds from a low 50 kg/ha/yr prior to the introduction of the FFDA scheme during 1973-74 to over 2100 kg/ha during 1992-93 (Sugunan 1997). The government has constructed 47 commercial fish seed farms and hatcheries under both the National Programme for Fish Seed Development and the Inland Fisheries Project with World Bank assistance. Brackish water aquaculture, mainly shrimp farming, involves three categories of farmers/entrepreneurs, i.e., small and medium farmers, middle-level entrepreneurs and big entrepreneurs. The involvement of the private sector in shrimp farming based on middle-level technology, utilizing the resource and technological inputs available locally or elsewhere, is of very recent origin. Along India's east and west coasts, particularly those of Andhra Pradesh and Tamil Nadu, a large number of commercial integrated shrimp farming units with foreign collaboration are emerging and adopting scientific culture systems with facilities for production of shrimp seed, shrimp feed and processing. Constituted under the *Environment (Protection) Act, 1986*, the Aquaculture Authority is mandated to protect the ecologically

fragile coastal areas, sea shore, water front and other areas through regulation of shrimp culture in coastal States and Union Territories of India. The Authority promotes development of sustainable and responsible shrimp farming practices within and outside the Coastal Regulation Zone.

### ***Forests***

The VII FYP also pointed to the depleted state of forestry resources. It noted that the National Forest Policy of 1952 stipulated that the country should have a coverage of at least 1/3 of its geographical area under forest with 60 per cent in hilly tracts and 20 per cent in the plains. The estimates at the time, however, showed coverage of 23 per cent or less. It was also estimated that 1.5 million hectares of forest cover was lost annually based on the prevailing trends then. These adverse trends were related to the growing demands for forest resources by the economy without adequate investment on preservation. The VII Five-Year Plan re-emphasised the need to bring 1/3 of geographical area under forest cover by the year 2000.

India has a recorded forest cover of 76.52 million hectares accounting about 23 per cent of total geographic area as against 33 per cent recommended by the National Forest Policy 1988. The per capita availability of forests in India is 0.08 ha which is a tenth of the world average of 0.8 ha. Statutorily forests have been classified into Reserved, Protected and Unclassed forests. Table 21 reveals that the area under forests has increased over the years. The reserved forest, which was about 47 per cent of the total forest area during 1951-52, increased to about 54.43 per cent by 1999. The area classified as protected forests also considerably increased during this period whereas unclassified forest recorded a sharp decline. However, according to Forest Survey of India (1999), only 63.34 million hectares (about 19.39 hectares) can be classified as actual forest cover<sup>3</sup>.

### ***Forest Types and Changes in Forest Cover***

The forests in India have been classified into 16 types, ranging from tropical wet evergreen to alpine with the tropical deciduous types (both moist and dry) constituting the bulk (over 65 per cent) (TERI 1999). Nearly eight per cent of the actual forest cover consists of tropical wet evergreen. The altitudinal distribution of the actual forest cover shows that in both the plains and the hills, it is less than the 33 per cent stipulated in the National Forest Policies of 1952 and 1988. Over two thirds of the actual forest cover is located at altitudes less than 600m, one-fourth is located at altitudes ranging from 600 to 1,800 m and over one-twelfth at altitudes ranging from 1,800 to 4,000 m. The occurrence of forests is negligible at altitudes more than 4,000m (TERI 1999).

**Table 21. Classification of Total Forest Area (km<sup>2</sup>): 1951–52 to 1999**

Classes	1951–52	1960–61	1970–71	1979–80	1991	1997	1999
Total forest area	734,441	750,379	738,444	729,077	770,078	765,210	765,253
Area by legal status							
Reserved	344,830 (46.95)	316,092 (42.12)	360,247 (48.78)	372,523 (51.10)	414,916 (53.88)	416,516 (54.43)	416,547 (54.43)
Protected	152,017 (20.70)	240,543 (32.06)	212,739 (28.81)	225,364 (30.91)	233,080 (30.27)	223,309 (29.18)	223,321 (29.18)
Unclassed	237,594 (32.35)	112,129 (14.94)	115,139 (15.59)	105,579 (14.48)	122,081 (15.85)	125,385 (16.39)	125,385 (16.39)

*Source:* Government of India (2000d); Forest Survey of India (1997 and 1999)

*Note:* Figures in parenthesis indicate percentages.

The forest cover is broadly classified into 3 classes, namely, dense forest, open forest and mangrove and is based on internationally adopted norms of classification. Though the area under forests has remained practically the same. According to Forest Survey of India, only 377,358 sq.kms (11.48 per cent of the total geographical area) can be considered as dense forest (crown density 40 per cent and above). Significantly, the area under dense forest, which showed a decline during the period 1995-1997 has shown a marginal increase during 1997-1999 (Table 22). A marginal decline in the open forest whose crown density was between 10 and 40 per cent was also observed during the same period. Nearly 48271 sq kms (0.15 per cent) constitute mangroves.

#### Forest Stock and Growth

The average growing stock of the forest cover is over 74 m<sup>3</sup>/ha, which compares poorly with the world average of 110 m<sup>3</sup>/ha. The total estimated growing stock of wood in the country is 4,741 million cubic metres with an annual increment of 88 million cubic metres amounting to 1.86 per cent of the total growing stock. Considering the recorded forest area of the country, the average annual production of 88 million cubic metres works out to 1.15 m<sup>3</sup>/ha (or 1.37 m<sup>3</sup>/ha taking into account the actual forest cover) which is much less than the world average of 2.1 m<sup>3</sup>/ha. Thus, in terms of both growing stock and annual production India is far behind many of the countries of the world. The productivity of forests in India is estimated to be around 77.3 m<sup>3</sup> / hectare (TERI 1999).

**Table 22. Land Cover as Per 1987, 1997 and 2001 Assessments in India**

Category	Area (km <sup>2</sup> ) 1987	Percentage of the Total Geographi- cal Area 1987	Area (km <sup>2</sup> ) 1997	Percentage of the Total Geographi- cal Area 1997	Area (km <sup>2</sup> ) 1999	Percentage of the Total Geographi- cal Area 1999	Area (km <sup>2</sup> ) 2001	Percentage of the Total Geographi- cal Area 2001
Dense forest (crown density 40 per cent and above)	361,412	10.99	367,260	11.2	377,358	11.48	416,809	12.68
Open forest (crown density 10 per cent to less than 40 per cent)	276,583	8.41	261,310	8.0	255,064	7.76	258,729	7.87
Mangroves	4,046	0.12	4,827	0.15	4,871	0.15	4,482	
Scrub area (tree lands with less than 10 per cent crown density)	76,796	2.34	57,211	1.7	51,896	1.58	47,318	1.44
Non-forest	255,7436	77.79	2,596,655	79.0	2,598,074	79.03	2,611,725	79.45
Un-interpreted	11,524							
Grand total	328,7797	100	3,287,263	100	3,287,263	100	3,287,263	3,287,263

Source: Forest Survey of India (1989 and 1995) and MoEF (1999 and 2001a)

Forest Products

Forests are being harvested for timber, industrial raw material, non wood forest products and fuelwood. One observes a declining trend in the contribution of forestry sector to the gross domestic product over the years. The percentage share of forestry and logging in total GDP which was about 2.66 per cent during 1980–81 has declined to about less than one per cent by 2000–01 (Table 23).

**Table 23. Contribution (Million Rupees) of Forestry and Logging to the Gross Domestic Product and its Percentage Share: 1980–81 to 1996–97**

Year	Contribution to GDP by Forestry and Logging		Percentage Share of Forestry and Logging in Total GDP	
	Current Prices	Constant Prices (1980/81)	Current Prices	Constant Prices
1980/81	32,620	32,620	2.66	2.66
1990/91	82,810	31,050	1.73	1.46
1996/97	112,930	29,300	0.98	0.99

Source: TERI (1999) ; EPW (2002).

As evident from Table 24 firewood is the major contributor to the total value of output from forestry sector. While the value of output from firewood had remained almost the same during 1980–81 to 1994–95, the value of output from industrial wood declined sharply at constant prices. The value of output from minor forest products which was about Rs 4,030 million during 1980–81 increased to Rs 6,390 million by 1990–91. However, since then it has recorded a decline to about Rs 4,270 million at constant prices by 1994–95.

**Table 24. Value of Output (Million Rupees) from Forestry and Logging: 1980–81 to 1994–95**

Year	Current Prices				Constant (1980/81 Prices)			
	Industrial Wood	Firewood	Minor Forest Product	Total	Industrial Wood	Firewood	Minor Forest Product	Total
1980–81	9,130	23,090	4,030	36,250	9,130	23,090	4,030	36,250
1990–91	14,700	59,910	17,400	92,010	4,610	23,500	6,390	34,500
1994–95	18,080	79,900	15,030	114,010	3,950	23,610	4,270	31,830

Source: TERI (1999)

The gap between consumption and recorded production of fuelwood is seen to be widening. As per TERI (1998) estimates the annual withdrawal of fuelwood is 260 million cubic metres against the estimated production capacity of about 52.6 million cubic metres. Similarly, the gap between the requirement and production of industrial wood also increased considerably during 1947-97. While the requirement and production of industrial wood was 2.5 million cubic metres during 1947, the requirement by 1997 rose to about 34 million cubic metres. The production during 1997 was only 14 million cubic metres meeting only about 41 per cent of the total requirement in that year (Table 25).

**Table 25. Scenario of Industrial Wood (Million Cubic Metres)**

Year	Requirement	Production	Gap	Production as Percentage of Requirement
1947	2.5	2.5	0	100
1997	34.0	14.0	20	41
Rise (per cent)	1,260.0	460.0	-	-

Source: TERI(1998)

#### Pressures on Forest

Forests in India have been subjected to various sorts of biotic pressures. Diversion of forest land for non-forest uses has been a major problem. It has been estimated that during the first 50 years of independence, 5.3 million hectares of forest land (about seven per cent of total forest area) have been diverted to other uses such as agriculture, river valley projects, mining, industries, township, roads, transmission lines, etc (TERI 1999). Degradation of actual forest cover is also a major cause of concern. It has been noted that the increasing pressure of population and livestock has contributed to the degradation of forests. Encroachments, shifting cultivation, excessive grazing, frequent fires and other biotic pressures have adversely affected the natural regeneration of forests.

#### Efforts for Conserving Forests

Taking the above into account, the Government of India has adopted several initiatives for the management of forest resources on a sustainable basis and to increase the forest cover and its productivity. Some of the important initiatives are the enactment of *Forest Conservation Act 1980*. In order to reduce the biotic pressures, the government had launched a massive afforestation programme including social, farm and agro forestry. The adoption of National Forest Policy 1952 and 1988 was a major step towards protecting

forests in India. Efforts are being made to involve the local communities in protection, management and development of forests, for example, the joint forest management. The National Forestry Action Programme translates the objectives of forest conservation into issue based programmes. There is a comprehensive work plan for sustainable development of Indian forests for the next 20 years which focuses on protection of existing forest resources, improvement in forest productivity, reduction in total demand of forest products, strengthening of policy and institutional framework and expansion of forest area. The National Afforestation and Ecodevelopment Board has been created to promote regeneration of degraded forests and ecologically fragile areas. Its efforts are complemented by the activities of the National Wasteland Development Board (MoEF 2002).

### ***Biodiversity and its Conservation***

India's wide variety of agro-climatic zones that harbour a rich repository of biological resources endows it with a unique phyto-geographical and agro-ecological diversity. With only 2.5 per cent of the total land area of the world, the known biological diversity of India contributes 8 per cent to the total known global biological diversity with a species count of 0.126 million. It is one of the 12 mega-biodiversity regions of the world and has two of the 18 identified hot-spots (Western Ghats and the Eastern Himalayas) of the world. Forests are the habitat for wildlife. The long coastline and the tropical climate favour a multitude of coastal and offshore marine ecosystem.

There are about 45,000 species of plants and over 68,000 species of animals distributed in 2 bio-geographical realms and 12 bio-geographical provinces. Besides, there is also a sizeable endemic component. Among the flora, about 15,000 species are flowering plants, of which nearly 33 per cent is endemic, located chiefly in 26 endemic centres. India has been recognized as one among the twelve centres of origin of diversity of several plant species in the world. India's rich germ plasm resources include 51 species of cereals and millets, 104 species of fruits, 27 species of spices and condiments, 55 species of vegetables and pulses, 24 species of fibre crops, 12 species of oil seeds etc., (MoEF 1994). India has also the distinction of having some of the widest range of breeds within each species thereby representing a significant percentage of world's domesticated livestock diversity.

It may be noted that importance and uses of biodiversity in India include its ethical values, ecosystem services and values of biodiversity, livelihoods, health and food security values and economic values. However, the biodiversity in India has been facing several threats. The causes for

biodiversity loss are manifold. Rapid expansion of agriculture and industry, urbanisation and large scale development projects like dams, highways, mining and expansion and intensification of human activities are major threats to biodiversity mainly through destruction and degradation of habitat. Genetic erosion has also taken place in domesticated species of plants and animals mainly because of introduction and promotion of a few 'high yielding' varieties of crops and livestock.

#### *In situ Conservation*

India has a wide network of *in situ* conservation through the establishment of National Park and Wildlife Sanctuaries. These are generally concerned with selected keystone species of both ecological and aesthetical value, including those which have become endangered due to significant degradation in their habitats. Currently, there are 89 National Parks and 496 Wildlife Sanctuaries covering 1.83 million sq.kms in the major bio-geographic zones of India. In order to ensure the unhindered evolution of micro-organisms, plants and animals in their totality, and as part of the natural ecosystem, the Government of India has designated 7 Biosphere Reserves based on a comprehensive concept of conservation, evolved in 1971 by the UNESCO's Man and Biosphere Programme (Sinha 1998). Considerable effort has been made in restoring a viable population of important animals such as tigers, elephants, lions, rhinoceros, etc. For example, Project Tiger launched in 1973, has been successful in increasing tiger population. Similarly, Project Elephant launched in 1991-92 aims at ensuring long term survival of identified viable populations and restoring their lost and degraded habitats and also aims to mitigate man elephant conflicts. A programme called 'eco-development' which integrates the ecological and economic parameters for sustained conservation of ecosystems by involving the local communities with the maintenance of earmarked regions surrounding protected areas has been initiated in recent years. India has also launched programmes for scientific management and wise use of the fragile ecosystem. Specific programmes for management and conservation of wetlands, mangroves and coral reefs etc., are being implemented. Six internationally significant wetlands of India have been declared as 'Ramsar Sites' under the Ramsar convention. Under World Heritage Convention five natural sites have been declared as 'World Heritage Sites'.

Indian systems of medicine have recognised the medicinal use of several species of plants. The use of over 7,000 species has been conserved and ecosystems with high medicinal plant diversity have been protected as sacred forests (MoEF 1994).

### Ex situ Conservation

To complement *in situ* conservation, attention has been paid to *ex situ* conservation by establishing Botanical gardens and Animal parks. There are about 33 Botanical gardens for conservation of plant diversity and several zoos and parks for *ex situ* preservation of wild life. The *ex situ* collection of wildlife is primarily for the purpose of captive breeding and multiplication of threatened species for reintroduction into the wild and for the purpose of public education.

### Legal and Policy Framework for Biodiversity Conservation

Over time, India has evolved a legal and policy framework for the conservation of biodiversity in the country. On the legal side there, are a number of measures to protect biodiversity: the *Forest Act 1927*, the *Wildlife (Protection) Act 1972*, the *Forest (Conservation) Act 1980*, the *Environment (Protection) Act 1986*, and the recent *Biodiversity Act 2002*. Various Central Acts are supported by the state laws and statutes concerning forests and other natural resources. Policies, strategies and action plans relevant for the conservation of biodiversity are several and include National Forest Policy amended in 1988, National Conservation Strategy and Policy Statement for Environment and Sustainable Development, National Policy and Macro Level Action Strategy on Biodiversity and Environmental Action Plan.

India is a signatory to the Convention on International Trade in Wild Species of Endangered Flora and Fauna (CITES) to regulate / ban trade in these species. India is also a signatory to the Convention on Biological Diversity 1992. It requires the parties to prepare National Biodiversity Strategy and Action Plan (NBSAP). India has prepared a National Policy and Macro Level Action on Biodiversity through an extensive consultative process. This documents macro level policies, gaps and actions needed for conservation and sustainable use of biological diversity. With the help of Global Environment Facility India has also prepared a National Biodiversity Strategy and Action Plan (NBSAP). Key features of the programme include the emphasis on decentralised state level planning and the use of interdisciplinary working groups to involve all sectors concerned with biodiversity conservation. Under NBSAP, about 20 local micro-planning processes at village to district levels, 33 state and Union Territory level processes, 10 planning exercises at ecological regions cutting across states are engaged in collecting a variety of area specific information and perspectives. Each of these involves a variety of actors from farmers and fisher folk, tribals to scientists and academicians, governmental and non-

governmental organisations, corporate sector etc. Documentation of local people's knowledge on the status, uses and management of biological resources constitutes the People's Biodiversity Registers (PBRs). It envisages the creation of decentralised country-wide database on status of biological resources. Preparation of village wise People' Biodiversity Registers have been undertaken in a few states. The State Plan for Kerala has also actively promoted documentation of local knowledge regarding biodiversity in people's biodiversity registers (Forest Survey of India 2001b).

#### Documentation, Research and Monitoring

The Botanical Survey of India and the Zoological Survey of India carry out the surveys of floral and faunal resources in the country. The Forest Survey of India uses remote sensing technology to assess the forests and tree cover with a view to developing an accurate data base for planning and monitoring. The reports are published at the district, state and national levels, besides Red Data Books on threatened/ endangered/ endemic plant and animal species for planning suitable conservation measures. The National Bureau of Plant Genetic Resources, the National Bureau of Animal Genetic Resources, the National Bureau of Fish Genetic Resources are actively involved in collecting information and documenting of plant, animal and fishery resources in the country.

#### **Energy**

The two sources of vulnerability on energy front have been related to (1) the reliance on imports for critical energy supplies linked to the low levels of export earning capacity of the economy and (2) the burden on environment placed by a strategy based on exploitation of the abundant domestic supplies of coal. An additional factor that underlies these concerns is the present low level of energy consumption relative to population or GDP but clear possibility of a rise in both as economic development takes place. In other words, securing reliable, cheap and environmentally benign supplies of energy has become an important policy goal. Before we look at the trends in energy consumption, which point to the different dimensions of energy needs of the economy, we note the concerns highlighted on the policy front from time to time.

Addressing the rising demand for energy and the pressures it places on the economy and resources, the VII FYP focused some attention on the 'renewable sources of energy'. The concern here was on meeting the needs of rural economy. Given the need for energy and the adverse effects of over-exploitation of forest resources for fuel wood on the forest wealth, the VII FYP stated that the long-term objective over the next 15 years

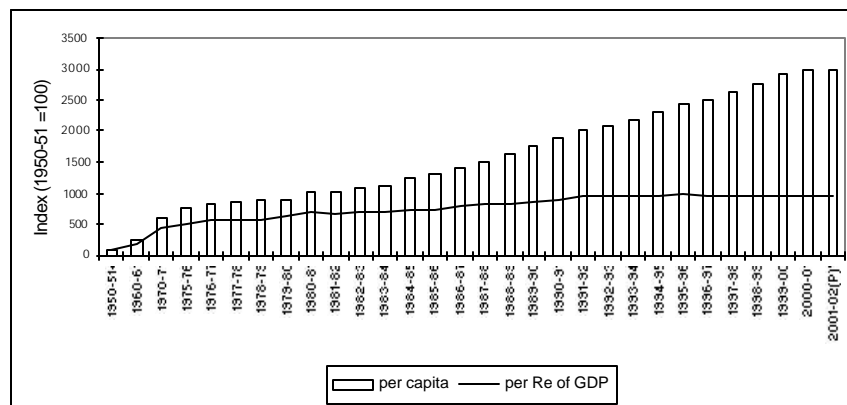
would be bringing about a shift from non-commercial sources of energy, which are detrimental from an environmental perspective to an intensified rural electrification programme and a viable renewable energy programme for rural areas. A massive energy plantation programme based on fast growing species of trees, plantations on the wastelands, utilisation of bio-gas and bio-mass were considered as feasible options for generation of energy for rural areas. The VIII FYP (1992-1997) called for measures to reduce energy intensity in different sectors of the economy through changes in technology and processes. It emphasised the maximum use of renewable sources of energy. It indicated the need for increased hydel generation.

The X FYP (2002-2007) provides a brief but comprehensive policy expression: “the key issues facing India which have energy implications are, therefore, rising population, need for economic growth, access to adequate commercial energy supplies and the financial resources needed to achieve this, rational energy pricing regime, improvements in energy efficiency of both the energy supply and consumption, technological upgradation, a matching R&D base and environmental protection”.

The importance of developing a modern energy sector for sustaining economic development was recognised early in the planning process. Development of the power sector was predominantly the responsibility of the public sector. Non-commercial sources of energy were predominant in rural areas supplying as much as 71.6 per cent of total primary energy consumption in 1953-54. By 1996-97, the share of non-commercial energy declined to 34.1 per cent. Energy consumption, including commercial and non-commercial sources increased from 89.61 million tonnes of oil equivalent in 1953-54 to 373.43 million tonnes of oil equivalent in 1996-97. The increase by 325 per cent over the 43-year period is far greater than the increase in population by 150 per cent indicating sharp rise in energy consumption with the growth of the economy. The per capita consumption of electricity has been more rapid than the growth in the consumption of electricity per rupee of GDP (Figure 16).

Faster growth of electricity use has also been a reflection of substitution of other forms of energy by electricity. For example, the IX Five Year Plan shows that coal accounted for 80 per cent of final commercial energy consumed in 1953-54 but in 1996-97, this percentage had decreased to 28.9. The energy sources that showed an increase were petroleum products, natural gas and electricity.

**Figure 16. Energy Generated Per Capita and Per Rupee of Real GDP: Indices with 1950-51 = 100**



Source: Government of India (2003)

By international standards, India's energy consumption on per capita basis is very low. Therefore, with further economic growth demand for energy is likely to increase rapidly. Besides planning for meeting the rising demand for energy, the volatile nature of international markets for crude petroleum products, particularly in the 1970s required attention to the development of domestic sources of energy. Coal being a major mineral resource of the country, thermal power plants have been built using coal as the feedstock. The coal based power plants account for close to 90 per cent of the installed capacity of the thermal power plants of the utilities today. The power plants based on petroleum products and gas account for the balance 10 per cent.

Petroleum products play a critical role in meeting the energy requirements of transportation sector, besides their use as a cooking fuel in households. India relies on imports for over 70 per cent of its requirements of petroleum products. The need for greater self-reliance in the energy sector has to be balanced with the environmental concerns. Given the high ash content of Indian coal, attention to technologies that reduce pollution from the use of coal in power plants is important. In this context, programmes aimed at energy use efficiency and conservation have been operating both in the energy sector and industry. Minimising the loss of energy in transmission and distribution has received increased attention in recent years with a view to making the public sector power units economically viable.

The search for ways to supplement energy from non-renewable sources such as the hydrocarbons and fossil fuels has led to the promotion

of renewable sources of energy. Large potential exists for generating energy from bio-mass based fuel, bio-gas and improved wood stoves. Solar energy and wind energy are beginning to be tapped for generating power. Potential for mini hydroelectric projects is estimated to be about 10,000 MW whereas the actual capacities are less than 500 MW. The ocean-based energy remains untapped. There have been programmes aimed at utilising energy from bio-gas and bio-mass, especially in the rural areas. Development of mini hydroelectric power projects is also being supported in the private sectors. In the transportation sector, there has been a switch to less polluting fuels. The city of Delhi has switched its entire public road transport system to compressed natural gas. There are attempts to exploit inland water-ways for transportation wherever potential exists.

The need for further investment in the energy sector to meet the growing demand for energy has led to the opening up of this sector for private sector participation. This has necessitated several institutional changes such as setting up independent regulatory agencies both at the state level and central level; provision of suitable business mechanisms for generation, transmission and distribution of power; supply of fuels and so on. The experience so far is still one of a transition phase. The oil and gas exploration programme has received new impetus with the entry of private sector in these efforts.

The X Five-Year Plan advocates reducing energy intensity of the economy by a variety of measures such as,

- energy conservation, optimal fuel-mix, appropriate modal mix in transportation, co-generation of power, recycling, new designs of products;
- better roads, better vehicle design to reduce fuel use, use of CNG and synthetic fuel, better urban planning;
- shift to renewable sources of energy; and
- R&D for greater energy efficiency.

It also emphasises incorporating environmental considerations in energy development strategies by (1) including catchment area treatment and reclamation of degraded land in hydro projects, (2) restricting air and water pollution to the regulatory norms, and (3) clear safety standards in nuclear projects. It also points to the need for afforestation programmes and providing more reliable supply of power to the consumers so that pollution from stand-by generating facilities is avoided.

### ***Population Growth***

It was on an optimistic note that the first Five Year Plan assumed an annual rate of growth of population at 1.25 per cent based on the

experience of the previous decade. Population growth exceeded 2 per cent per year for the first four decades of the plan period. In nearly all the subsequent FYPs, following the first, control of population growth became an important policy concern. At over 1 billion people today, India is the second largest nation in the world behind China and it is expected that India's population would exceed China's in the next 20 years. The pace of population growth experienced in the past 50 years has been a critical factor offsetting some of the gains made on the growth front. Larger population puts pressure on resources, creates greater demand for basic necessities of life whose supplies are in scarce supply in a developing country and puts infrastructure, urban and rural under constant strain.

The decadal rates of growth of population have been summarised in Table 26. It is not merely the high birth rates that have driven the population growth but the declining death rates have had an equally important role in keeping the population growth at a high level. While the decline in death rates has been a consequence of development including the impact of interventions leading to better health-care, achieving greater control over birth rates has been the focus of many other policy interventions. The success of various programmes has often been described as disappointing.

The more recent projections of population do show a tendency toward lower rate of growth in the future and the possibility of stabilisation by 2020. The growth of population has posed challenges for development policies for a variety of reasons. First, population growth requires growth in the production of basic necessities of life such as food, clothing, shelter and energy to adequately meet the needs of rising population. It requires increased facilities for education, health, water supply and sanitation. What makes the challenge harder is that the demand for a number of public goods increases faster than the increase in the resources of the government.

**Table 26. Decadal Rate of Growth of Population**

Year	Crude Birth Rate per 000	Crude Death Rate Per Thousand	Population Growth Rate (Per Cent) Per Year
1971	36.9	14.9	2.20
1981	33.9	12.5	2.14
1991	29.5	9.8	1.97
2000	25.8	8.5	1.73

*Source:* Government of India (2000a)

**Table 27. State level Variations in the Growth Rates of Population for the Recent Two Decades (Per '000)**

States/UTs	Crude Birth Rate	Crude Death Rate	Population Growth Rate*
India	26.1	8.7	17.4
Andhra Pradesh	21.7	8.2	13.5
Assam	27.0	9.7	17.3
Bihar	31.5	8.9	22.6
Gujarat	25.4	7.9	17.5
Haryana	26.8	7.7	19.1
Karnataka	22.3	7.7	14.6
Kerala	18.0	6.4	11.6
Madhya Pradesh	31.1	10.4	20.7
Maharashtra	21.1	7.5	13.6
Orissa	24.1	10.7	13.4
Punjab	21.5	7.4	14.1
Rajasthan	31.1	8.4	22.7
Tamil Nadu	19.3	8.0	11.3
Uttar Pradesh	32.8	10.5	22.3
West Bengal	20.7	7.1	13.6
Arunachal Pradesh	22.3	6.0	16.3
Chhatisgarh	26.9	9.6	17.3
Goa	14.3	7.2	7.1
Jharkhand	26.3	8.9	17.4
Himachal Pradesh	23.8	7.3	16.5
Manipur	18.6	5.4	13.2
Meghalaya	28.7	9.1	19.6
Mizoram	17.0	5.5	11.5
Nagaland	11.8	2.3	9.5
Sikkim	21.6	5.8	15.8
Tripura	17.0	5.7	11.3
Uttaranchal	19.6	6.5	13.1
Andaman & Nicobar Islands	18.1	5.5	12.6
Chandigarh	17.9	3.9	14.0
Dadra & Nagar Haveli	34.2	6.6	27.6
Daman & Diu	26.9	7.1	19.8
Delhi	20.3	4.8	15.5
Lakshadweep	25.1	4.7	20.4
Pondicherry	17.7	6.9	10.8

*Note* \* Calculated as CBR-CDR

*Source*: Government of India (2001a).

There is also a regional perspective on population growth, reflecting partly the underlying variation in development across regions. The regional variation also reflects the impact of government interventions in education, health and population services. The state-level variation in the growth rates of population for the recent two decades is given in Table 27 above.

## **CHAPTER II**

### **STRATEGIES AND PROGRAMMES FOR DEVELOPMENT**

#### **1. Institutions for Development**

A challenge to policy-making and policy implementation is the development of institutions and institutional arrangements to effectively implement the development policies. For implementing the development policies in a heterogeneous society, democratic and participatory institutional mechanisms are necessary at all levels of government programmes. Their evolution requires time. India today has 30 States and another 8 Union Territories. It has about 600,000 villages and 10,000 urban areas. The number of towns with population of more than 1 million is 23. The task of designing and implementing the development programmes, thus, has always been huge.

For administrative purposes States are divided into districts, which are, then sub-divided into blocks of villages. The village forms the bottom layer of the rural administration. In the urban areas, municipalities are the local government units of administration.

#### ***(a) Decentralisation of Governance: The Panchayat Raj System of Local Governance***

The national Five Year Plan mechanism introduced planning at the state level which, in turn, encouraged district level planning. Success of the national plans, clearly, was dependent on the appropriateness of these development programmes at the local level. Although local governments were involved in the implementation of development programmes, their involvement in the design of programmes was minimal. In recognition of this limitation, there has been a move towards decentralisation of development planning and programmes. The large size of the country and slow speed of communication and decision processes required decentralised approach to governance in issues that required prompt attention at the local level.

The 73<sup>rd</sup> and 74<sup>th</sup> amendments to constitution in 1992 provide greater financial powers to the local governments while assigning specific responsibilities of governance and development work. The amendments have given statutory recognition to a three-tier system of governance with Panchayati Raj Institutions (PRIs) at the District (Zilla Parishad), Intermediary (Taluk or Block Panchayats) and Village levels (Gram Sabha/Panchayats). The elected institutions were to have a uniform five year term and in the event of dissolution, elections are to be held within six months. A State Finance Commission is to be appointed by every state government to

decide on revenue sharing with the Panchayati Raj Institutions. District Planning Committees (DPCs) for formulating plans have to be constituted in every district with two-third of the membership reserved for elected members of the district Panchayats. It is also mandatory for all the state governments to enact conformity legislation (Issac and Franke 2000).

A review of the status of the PRIs in terms of the conduct of Panchayat elections, constitution of District Planning Committees, status in respect of recommendations of the respective State Finance Commissions on devolution of funds to PRI bodies, etc shows that the performance of PRIs varies across states. Although the PRIs provide a framework of decentralised rural development, the performance so far suggests that their operation in most states has not been able to enhance participation and empowerment adequately and effectively.

The National Human Development Report 2001 highlights major areas of concern in decentralised governance. For example, most states have retained adequate financial and administrative powers *vis-à-vis* PRIs. Implementation is a gradual process of democratic decentralisation. It has been recognised that certain steps need to be taken on a priority basis if the PRIs have to deliver on their promise and potentialities (Planning Commission 2001). These include:

- amendment of the constitution to enable states, if they so wish, to abolish either the district or the block level tier of the Panchayats and retain only one out of these two in addition to the village level body;
- restrictions needs to be imposed on the devolution of Central Finance Commission Funds and from other sources to the states unless administrative and financial powers are effectively devolved to the PRIs;
- strengthening PRIs with revenue raising powers of their own in order to reduce their excessive dependence on State and Central Government. PRIs have to be encouraged to mobilize local resources for availing matching grants from the Central / State governments; and
- building capacities to help the PRIs to manage their responsibilities effectively.

The new impetus to decentralised governance in the country is based on a variety of other experiences. The success of PRIs is critical in dealing with local problems by the local people.

***(b) Co-operatives in Agriculture: The Case of Dairy Sector***

The co-operatives had been given an important role in agriculture even in the pre-independence period. Co-operatives drew the attention of

the national leaders early in the development efforts, as a form of organising small producers and consumers to derive the benefits of economies of scale in any economic activity. Production, marketing of the produce and purchase of inputs or consumption items were considered among economic activities that could be performed more efficiently through collective, co-operative action. The major area in which co-operatives have continued to play an important role is agriculture. Co-operatives are prominent in agricultural production, processing, marketing and credit. The government policies have supported the growth of co-operative sector by providing financial, administrative and technical support. There are a number of product or commodity-oriented co-operatives in the country such as in sugar, weavers' co-operatives, dairy co-operatives, fishery co-operatives and so on. In the mid-1990s, there were a total of 0.47 million co-operatives in the country operating in different sectors with more than 220 million members. Co-operatives account for 44 per cent of rural credit flow, 31 per cent of rural bank deposits and 34 per cent of fertilisers distributed in the country (Singh and Pundir 2000).

The co-operatives have emerged as instruments of rural development primarily because of their organisational structure that provides for active participation of individuals at the local level. The democratic and open-membership features provide greater chances of accountability and participation. The success of this type of organisation in a setting where literacy was low and the society was often segmented into social classes required substantial government interventions and the success has varied across different regions in the country and across different sectors.

One sector where co-operatives have been important agents of change is dairying. Following the success of 'AMUL', the 'Anand' model in Gujarat where dairy farmers were organised into village level co-operatives, which, in turn, formed a union of co-operatives at the district level to produce, process and sell milk and milk products, a programme of dairy development was launched by the government across the country. Named as 'Operation Flood', the programme had at its core dairy co-operatives in the villages. The scale of the programme can be gauged from the fact that it is now operating in almost all the states with over 100,000 co-operatives and a membership of 11 million. These co-operatives procure 17.6 million kg of milk per day and sell 13.4 million litres per day. The co-operatives provide a variety of services to the members such as technical inputs in the care of dairy animals, transportation, processing and sale of their produce. Emergence of dairy co-operatives has provided larger market opportunities to the rural producers.

**(a) *Community Participation in Forestry Management: Social Forestry to Joint Forest Management***

The forest management in India since the nineteenth century colonial rule has been premised on models of centralised state control. One of the important objectives of forest management has been to optimise the production of a few valuable timber species for commercial and industrial purposes. However, the overall implementation of the strategy was inadequate in ensuring preservation of forest resources. The natural regeneration of forest suffered serious setback because of large-scale logging and resulted in its degradation. The over-exploitation not only eroded the natural resilience of the eco-system but also broke down the indigenous rights and local authority to control access and protect India's forests. Driven by growing concerns over timber requirements and rural fuel supplies and on the basis of the recommendations of the National Commission on Agriculture 1976, the government of India initiated a massive social forestry programme. The strategy was to raise wood for local needs on common and private land taking local pressures off natural forests so that they could be used for industrial purposes and environmental conservation (Poffenberger *et al* 1996). Augmenting the supply of small timber used for domestic and industrial purposes, checking soil erosion, promotion of conservation of water, provision of job opportunities for rural population etc., were some of the important objectives of social forestry programme. The programme envisaged raising plantations on all available private and community wastelands, and strips along roads, rails and canals, compounds of industrial and educational institutions. The social forestry programme was to be implemented specifically through different plantation models like farm forestry, community forestry, strip plantations, and rehabilitation of degraded forests and development of recreation forests. It gained added impetus especially from 1982-83 onwards when afforestation was included in the new 20-Point Programme (Ninan and Jyothis 2001). Area afforested which was only 52 thousand ha during the First Plan Period, increased to about 22.7 million ha by 1995-96. Under this programme large number of fast growing trees, primarily eucalyptus, was planted in India.

Social forestry, in general, and farm forestry, in particular, although successful in increasing the availability of construction poles, pulpwood, and small timber, it did not relieve pressures on natural forests. It has been criticised on a number of grounds. For example, eucalyptus, which was widely distributed and grown mainly, catered to the needs of paper industry rather than meeting rural needs, the spread of farm forestry affected local

food security in some regions by displacing food crops. The environmentalists criticised eucalyptus, which was the most popular species, raised under the programme on grounds that it led to depletion of groundwater table, loss of crop productivity *etc.*, (Ninan and Jyothis, 2001). The major drawback of social forestry programmes has been that they are often not designed to respond to local community interests or institutional capacities. As a result, communities were frequently dissatisfied with placing responsibilities for plantation management with political institutions such as the panchayat organisations. Moreover, social forestry programmes failed to respond to or resolve conflicts between communities and government over rights to natural forest lands (Poffenberger *et al.*, 1996). This failure led to the continued over use and weakened all attempts to stabilise forest use and allow ecological regeneration.

It was soon realised that forest conservation policies could not be determined in isolation from people and broader patterns of natural resource use, and this must be complemented by policies promoting sustainable and equitable development of the natural resource base as a whole. The National Forest Policy 1988 outlined the scope for people's participation in forest management and emphasised the need for creating a massive movement of people including the involvement of women for minimising pressure on forests and ensuring its sustainability.

Joint Forest Management (JFM) in India is an attempt to turn the concept of peoples' participation in the management of natural resources into a reality. It is a concept of developing partnerships between fringe forest user groups and the forest departments on the basis of mutual trust and jointly defined roles and responsibilities with regard to forest protection and development. The programme has been in formal existence since 1988 when the state of Orissa passed the first resolution on the subject, followed by West Bengal in 1989. The Government of India's commitment dates from 1990 when it issued policy guidelines for the involvement of village communities and voluntary agencies in the regeneration of degraded forest lands on 1 June 1990 under the JFM (joint forest management) programme (Sunder and Jeffrey 1989). Until then the state forest departments were pre-occupied with large, plantation-oriented social forestry projects and gave little attention to the community forest protection groups. As noted earlier, social forestry programmes which are acclaimed for establishing plantations on several million hectares failed to motivate and empower communities to strengthen their own resource management.

In contrast to the social forestry programme, the JFM strategy requires the government to empower communities allowing villagers to protect

the natural forests. Table 28 presents the main differences in orientation of social forestry and joint forest management programmes. The policy guideline of 1990 encourages non-governmental organisations, state forest departments, and community groups to collaborate in managing state forest lands. It involves formation of local (village) institutions and empowering them to undertake protection activities mostly on state-owned degraded forest land. Moreover, it gives considerable latitude in the types of community groups that might be involved, specifying panchayats, co-operatives, and informal village organisations.

It also places no restriction on membership. The community management groups are to be involved in the formulation of working plans for the forest area under their protection. Thus, it represents a process of decentralised empowerment benefiting some of India's most disadvantaged groups, while possessing the potential to reverse forest degradation (Poffenberger et al, 1996). As per the guidelines of JFM, communities are given some rights to timber and non-timber products from jointly managed community lands and a share of the timber harvests yielded by 'successful protection' (MoEF 1990). Several state governments have also issued notifications related to this. For example, the notifications of the Gujarat State Government issued in 1991 and 1994 for JFM focussed on timber production and procedure for final felling and distribution of produce. Since people have interest in fodder and non timber forest products implementation of programmes related to production of NTFPs as per the choice of village community is also allowed under JFM (Singh 1997). Access to forest land and usufructory benefits are given only to the beneficiaries who get organised into a village institution, specifically for forest regeneration and protection. Village level organisations like Forest Protection Committee (FPC) and Village Forest Committee (VFC) are being empowered and involved meaningfully in the decision-making process relating the activities, their location, execution and management of the same (Sharma 1997).

With regard to the constitution of Joint Forest Management Committees, usufructs sharing of benefits, gender issues, protection mechanisms, roles and responsibilities of the committees *etc.*, different types of mechanisms have been adopted by different states. Most state policy resolutions suggest that local panchayat institutions monitor the activities of the village groups.

For example, the Orissa resolution notes that the forest protection committees (*Vana Samrakshana Samiti*) be placed under the supervision of the 'Sarpanch of the concerned Gram Panchayat and the Forester as the Chairman and Convener of the committee respectively. Voluntary agencies

**Table 28. Orientation of Social Forestry and Joint Forest Management Programmes**

<b>Social Forestry</b>	<b>Joint Forest Management</b>
<b>Objectives</b>	
1) Satisfy local needs through fuelwood plantations	4) Meet local needs equitable for diverse range of forest products through natural regeneration under community participation
2) Supply timber, poles, and pulpwood to industries	5) Extend authority to communities to control forest access and allow local management
3) Establish fast-growing tree plantations on 0.4 million hectare of degraded land annually	6) Regenerate 30-50 million hectares of degraded under productive forest land
	7) Manage biodiversity, ecological sustainability and environmental benefits
<b>Who</b>	
1) Communities through village panchayat structure (average 500-2000 households)	1) Clearly defined and organised formal and informal community user groups (average 10-100 households) supported by the forest department
2) Private farmers (especially larger farmers with credit access)	2) Focus on most forest-dependent women, tribal and landless
<b>Where</b>	
1) Private lands	1) State forest lands (protected and reserve)
2) Common property (revenue lands, village grazing/panchayat land)	
<b>How</b>	
1) Forest department organised	1) Community organised
2) Making budget, setting targets	2) Emergence of community concern and ability to act
3) Establishing nurseries and plantations	3) Diagnosing social and ecological opportunities
4) Providing employment	4) Defining rights and responsibilities (products, benefit-sharing, protection)
	5) Microplanning process (access controls, silvicultural operations to enhance natural regeneration)
	6) Legitimising authority of community management group.
<b>When</b>	
1) Based on donor aid and budget process	1) Based on process of community activism and interest
2) Renewal based on target achievements	2) Expansion based on spontaneous or encouraged spread to other villages

Source: Poffenberger *et al* (1996)

and NGOs are associated as interface between State Forest Departments and the local village communities for revival, restoration and development of degraded forests. A Joint Forest Management Cell in the Ministry in the Forest Protection Division monitors the programme.

Although a detailed narration of the merits and demerits of JFM is not attempted here, it is worthwhile to point out that the Government of India took various steps to strengthen the programme in February 2000. This was after receiving considerable feedback from the States on the various issues contained in the earlier guidelines of JFM. This included the signing of a memorandum of understanding between the forest department and the JFM committees for ensuring a smooth working relationship between them and for bringing a sense of empowerment and accountability. JFM committees were to form the basic Forest Management Units to provide them a feeling of empowerment and enable them to effectively protect and conserve the forest resources. So far, 27 states have issued orders enabling the setting up of a mechanism for public participation in the management of forests. About 62,890 JFM committees covering an area of 14.25 m ha of forest land (that is, roughly about 21 per cent of the total recorded forest area) have been established (X Plan).

As per the recent guidelines, the JFM Committees are to be assigned specific roles for boundary demarcation, fire prevention and control of grazing, encroachments and illicit felling as well as to ensure sustainable non-destructive harvesting of NTFPs including medicinal plants. A provision to assist the JFM Committees has been made under the Centrally Sponsored Plan Scheme 'Integrated Forest Protection Scheme'. It stipulates that the relationship between the Panchayats and JFM Committees should be such that the JFM Committees take advantage of the administrative and financial position and organisational capacity of the Panchayats for the management of the forest resources. The JFM cell has also issued guidelines for capacity building for the management of NTFPs. This includes a plan of action for the collection, transportation, storage, processing and marketing of NTFPs. The JFM cell also suggests the states to provide legal backup to the JFM committees and to extend the programme in good forest areas rather than confining to degraded forests. It also emphasises increased participation of women and suggests that at least 50 per cent of the members of the JFM general body and at least 33 per cent of the membership in the Executive committee should be filled up by women members. The JFM Cell has recommended recognition of Self-Initiated Groups and the integration of micro-plan with the working plan apart from conflict resolution, monitoring and evaluation of JFM (MoEF 2000).

***(a) Community Participation in Water Resource Management: Irrigation and Drinking Water***

Management of water resources is emerging as a major challenge in public policy in the country. Participation of the community in managing water resources is now an essential element of any framework of policy for the sector. This is true not only in the case of irrigation but also in drinking water supply projects. Until recently, local issues relating to the use of water were a secondary consideration relative to supply while executing water supply schemes. Drawing lessons from the failure of such supply driven approach, the recent initiatives are beginning to involve the users in the management of water resources.

***Community Participation in Irrigation Management***

Traditionally, the management of major irrigation systems has been through a highly centralised bureaucracy with little user participation. Over the years while new capacities have been created at substantial cost for providing irrigation, the already created capacity has suffered due to lack of maintenance. Moreover, the system has been plagued by the problem of poor collection of user charges leading to problems of maintenance. The farming communities are also dissatisfied with the services rendered by the irrigation agency because the distribution of water was unpredictable, unreliable and inequitable. Since there was no incentive and motivation scarce water resources were not utilised efficiently (Joshi and Hooja 2000). In short, the irrigation sector has been facing the twin issues of sub-optimal sector planning and financial management, on the one hand and inadequate water management and maintenance, on the other.

There is a renewed interest in recent years to make community participation in managing water resources to achieve better outcomes. The idea of community participation in irrigation management is not altogether new. The Irrigation Enquiry Committee 1938, known as the Visvesvaraya Committee, had recommended entrusting more number of irrigation to a village or group of villages if the farmers were willing to take up co-operative irrigation. In India, there are examples of farmer-managed irrigation system from the *kuhls* of Himachal to the tanks of South India. The poor performance of large scale systems managed by the Government agencies, the major form of irrigation development since the 1950s, has led to a reassessment of traditional farmer-managed irrigation, and attempts to apply the benefits of greater user participation in the Government Managed schemes (Meinzen-Dick 2000).

The developments in irrigation management transfer policies and programmes indicate the progress made towards participatory irrigation management in India. It should be noted that the Command Area Development (CAD) programme started in 1974 although identified the involvement of farmers in irrigation management no significant efforts were made in this area until mid-1980s. While the VI Plan placed emphasis on the need for farmer's participation in the management of irrigation, the VII Plan reiterated it. Since then Command Area Development Programme has issued a series of guidelines, exhortations, and offers to the states to take up aspects of transfer. The National Water Policy 1987 also stressed the involvement of farmers in various aspects of the management of irrigation system, particularly in water distribution and collection of water rates. The VIII Five-Year Plan endorsed the need to involve users even at the planning stage of the project. It observed that more than setting targets in terms of numbers, potential etc., the perspective of irrigation water management in future should be based on the vision of an equitable and sustainable irrigated agriculture with the farmer being central to all considerations. The existence of different models of water users' association like Pipe Committees in Andhra Pradesh, the PHAD System Model, Mohini Users' Co-operative of Gujarat, Sinchai Panchayat in Madhya Pradesh, Water Users Association in Lower Bhavani Project in Tamil Nadu drew attention of the policy makers in the Eighth Plan. The Committee on Pricing of Irrigation Water (1992) also recommended farmer's participation in the management of irrigation system.

Considerable breakthrough was achieved during the IX FYP when the Planning Commission set up a separate Working Group on Participatory Irrigation Management (PIM). The Working group identified legal, institutional and financial aspects as being crucial to the effective implementation of participatory irrigation management programmes (Raju *et al* 2000). The IX FYP laid thrust on the promotion of PIM with full involvement of the water users' community. The participation of farmers in the management of irrigation would give responsibility for operation and maintenance and collection of water rates from the areas under the jurisdiction of the Water Users' Associations (WUAs) of concerned hydraulic level.

The WUAs may assume various organisational forms and functions according to regional and local needs. For higher levels of large irrigation systems PIM involves joint partnership between the farmers / WUAs/ federations of WUAs and the irrigation agencies / government (Joshi and Hooja 2000). The functions of the WUAs include acting as an interface between the farmers and the main system management of the irrigation

project as well as other concerned Government agencies; water distribution; operation and maintenance of the irrigation and drainage system; collection of water charges and other user charges or special charges that the WUAs may levy; conflict resolution; etc.

Meinzen-Dick (2000) notes that within India there is a great deal of variability in approaches to devolution and participation in irrigation. There are pilot or full-scale programmes in 14 states ranging from minimal changes proposed in some states like Haryana to more ambitious programmes in Maharashtra and Gujarat where farmers' organisations are to take over minor canal commands of about 500 ha with volumetric charges. State governments are also adopting legislative measures for involving farmer's participation in irrigation management. In 1997, Andhra Pradesh enacted two important sets of legislation which have become a trend-setter for the remaining states of India. The first legislation, "*Andhra Pradesh Water Resources Development Corporation Act 1997*" was to consolidate its thinly spread out efforts to manage all water resources from the resource conservation and sustainable development perspective. The second legislation is a strategic shift towards participatory irrigation management. The "*Andhra Pradesh Farmers Management of Irrigation Systems Act 1997*" calls for formation of WUAs throughout the State with a three tier federal structure. By the end of 1997 the state had created 10292 Water Users' Associations and 172 Distributary Committees for major projects (Raju *et al* 2000). External donors have also encouraged farmer's participation through a number of projects and programmes.

Despite all these attempts, it has been observed that the progress in achieving farmer's participation in irrigation management has been slow. As per the estimates, only 804,000 hectares are being managed by Water User's Association (IX Plan).

To accelerate the pace, the Union Government has taken several initiatives which aim at increasing the awareness of the issues constraining the growth of PIM, focussing on capacity building and providing legislative support to the WUA.

#### *Community Participation in Drinking Water Projects*

Most of the present water supply systems whether rural or urban have been designed and executed by the Department/Boards and provided to the end-users. Water has been regarded as a social good to be provided by the government rather than a scarce economic resource. Progressive change in this attitude is taking place in the recent years.

The IX Plan observes that the supply of water to the consumers should normally be based on the principle of effective demand which should broadly correspond to the standard service that the users are willing to maintain, operate and finance. Since most of the water supply projects are designed and executed by the implementing departments, there is an unwillingness of the local government bodies like panchayats to take on the responsibility for operating and maintaining them. It is expected that the implementation of a participatory demand-driven approach will ensure that the public obtain the level of service they desire and can afford to pay. The recovery of operation, maintenance and replacement costs will ensure the financial viability and sustainability of the schemes. The conditions under which people would be willing to maintain and operate water supply schemes have been identified and include their ownership of assets, if they have themselves installed the hand pump, if they are trained to do simple repairs, if they have sufficient funds etc. Hence, it is possible to institutionalise community based rural drinking water supply programme if the Panchayati Raj Institutions/local communities are empowered to generate resources and are trained and equipped to plan, implement, use, maintain and replace water supply schemes themselves in co-ordination with the Government agencies/Private Sector/NGOs. Incentives are provided to states for institutionalising community participation. Some States like Maharashtra, Karnataka, Mizoram, Goa, Kerala, etc., have already made a beginning in the concept of community participation in rural water supply programme.

The Accelerated Rural Water Supply Programme (ARWSP) currently implemented through the Rajiv Gandhi National Drinking Water Mission has been in operation since 1972-73. Necessary reforms were introduced in 1999 so as to gradually replace the government-oriented, centralised and supply-driven programmes by a people-oriented decentralised, demand-driven and community based one (Government of India 2003). In November 2002, the government of India issued a notification on the implementation of participatory and community led Swajaldhara Rural Drinking Water Projects. The Swajaldhara project is a demand-driven and community participation approach where the panchayats/ communities are to plan, implement, operate, maintain and manage all drinking water schemes, with partial capital cost sharing by communities in cash and full ownership of drinking water assets with Gram Panchayats (Government of India 2002c). The Beneficiary group under this project should be a registered society. Under the Swajaldhara projects the cost of the project excluding community contribution will be fully met by the government. The Swajaldhara Projects

can be implemented at the village / habitation / hamlet levels. Block Panchayat Gram Panchayat / Beneficiary Groups are responsible for

- the execution of the sanctioned schemes;
- placing the progress of scheme implementation in each Gram Sabha meeting;
- ensuring community participation in scheme activities;
- arranging community contribution towards capital cost, in cash;
- opening and managing bank accounts for the management of project funds;
- procuring construction materials / goods and selecting contractors for construction activities;
- supervising construction activities;
- commissioning and taking over completed water supply works; and
- Collecting funds, and managing O&M of water supply works.

Similar attempts are also made in the case of urban drinking water supply. Strategies to promote and strengthen decentralisation of production and distribution systems, privatisation and participation of the community in management and maintenance are expected to induct higher efficiency levels, effective out reach and also contain leakages and wastages. Under this strategy, special attention is given to strengthen the centrally sponsored Accelerated Urban Water Supply Programme (AUWSP).

**(a) *The Self-Help Groups***

The poverty alleviation programmes floated since independence were basically top to down in approach. Most of these programmes were designed and implemented with little involvement of the people concerned and therefore might have missed some important elements of the solution to the problem. This turned the focus on decentralisation and enhanced participation of the community at large viewed as an alternative paradigm for development strategy.

Access to credit facilities is an important factor that allows poor to take up economically productive activities and thereby enhance their incomes. However, providing credit to poor people through formal channels was beset with several problems including informational problems making it costly to lend to the poor. In this context, micro-finance programmes have emerged as an effective instrument of poverty alleviation. For example, over the last two decades, Grameen Bank of Bangladesh, the Self-Employed Women's Association (SEWA) in India and other micro-finance institutions

have devised innovative credit programmes to address market failure and deliver credit to the poor. Micro finance programmes use peer monitoring and joint liability structure to overcome the screening, monitoring and enforcement problems commonly encountered by formal lending institutions. They deliver small loans to poor borrowers, often women organised into small groups, providing more accessible deposit facilities and with much greater attention to risk management. Targeted micro-credit programmes have a strong anti-poverty focus as they aim to increase incomes and smooth consumption.

Self-Help Groups (SHGs) in India are small informal associations created for the purpose of enabling members to reap economic benefit out of mutual help, solidarity and joint responsibility. The benefits include mobilisation of savings and credit facilities and pursuit of group enterprise activities. These groups by way of joint liability enable the poor to overcome the problem of collateral security and thus free them from the clutches of money-lenders. It has been argued that the joint liability not only improves group member's accessibility to credit but also creates mechanisms like peer monitoring leading to better loan recoveries. Under SHG system, procedural formalities are minimal and the members can have access to institutional credit without collateral offering, full autonomy in the selection of activity, and the availability of thrift for meeting the urgent needs and flexibility in repayment schedule.

Formation of self-help groups by itself contributes to the empowerment and economic well-being of the poor by improving their collective bargaining position. The group formation emphasises social capital and enables the poor to interact with other social groups from a position of strength.

Although self-help groups have been in existence for a while, the process of organising women into SHGs started during the Ninth Five Year Plan. This was to provide them a permanent forum for articulating their needs and contributing their perspectives to development. The Small Industries Development Bank of India (SIDBI), National Bank of Agriculture and Rural Development (NABARD), Rashtriya Mahila Kosh (RMK) and many zilla parishads have emerged as important players in the promotion of self help groups in India. The SHGs promoted by NABARD for financing the poor by formal and non-formal institutions, which made a beginning in 1991-92, has made significant progress. So far more than 4.6 lakh self-help groups covering more than 78 lakh families have been set up earning the distinction of being the largest micro-credit programme in the world (Government of India 2003).

### The SEWA in India

The Self-Employed Women's Association (SEWA) Bank in Ahmedabad was initiated in 1972. It was established particularly for women in the informal sector. In 1973, a SEWA Bank was started to provide standard banking to poor urban women as well as to link the banking activities with other supportive services through SEWA. By 1976, SEWA Bank was in a position to begin advancing loans from its own resources. At the end of 1980, SEWA Bank had three special loan programmes: the block grant programme, a women's business development loan and a revolving fund to assist home-based workers to replace their old sewing machines. An analysis of the loan records showed that home-based producers received the largest share of the loans (46 per cent), followed by small scale vendors (33 per cent), agricultural workers (10 per cent) and service workers and labourers (2 per cent). The rest were made to women from other categories of workers. The loan money is used to invest in small trading as well as for household consumption, emergencies and social obligations.

The SEWA Bank is part of a larger strategy of SEWA to unionise poor self-employed women workers. SEWA members are typically women who have an established trade as such, rather than create new employment for them, their union has been involved largely in enhancing the women's incomes and improving their working conditions in current occupations. This has been done by linking them directly to suppliers of raw materials and markets, providing reasonably priced credit and organising them into production units where women collectively purchase raw materials and produce and sell their goods. In this way, the union addresses the greatest problems of the self-employed such as exploitation by merchants and middle men, limited access to credit, supplies of raw materials, markets and low incomes (Thampy 2002)

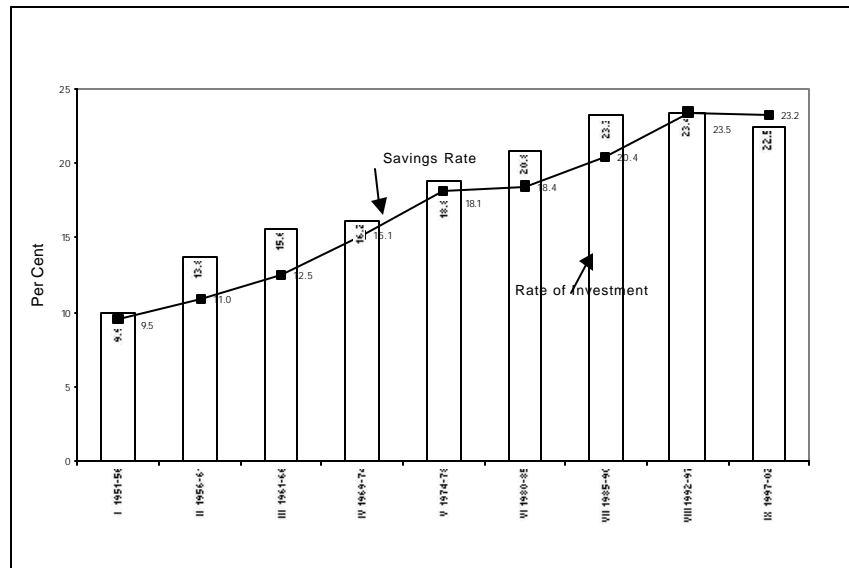
The emergence of non-governmental organisations as the major agents in the development programmes has been relatively more recent. Whether it is the spread of population or health services, educational services or organising the poor for the purpose of marketing of their produce, the NGOs have emerged as important agents of change. Involvement of the NGOs has provided additional support to the development effort, especially in designing and implementing development programmes.

## **2. The Mixed Economy Approach**

The planning process sought to provide a position of dominance to the public sector in economic development. Initially focussing on basic industries producing inputs such as steel, aluminium and other metals,

petroleum products and then machinery manufacturing the public sector enterprises became important in many sectors of the economy. The argument for 'social control' over production capacity has partly rooted in socialistic ideals but also partly due to the need for channelling resources for achieving plan targets. There was a need to step up investment and saving in the economy rapidly and the means to achieve this led to government interventions in mobilising resources and investment. In fact the step up in savings and investment over the various plan periods has been significant (Figure 17).

**Figure 17. Investment (GDCF) and Saving (GDS) as a Percentage of GDP at Market Prices**



Source: RBI (2001)

The role of private sector was visualised in areas where the scale of operation of a unit was small. This meant agricultural production and trade and small enterprises continued to operate in the private sector. The VI FYP aimed at achieving 60 per cent of the new investments of the economy in the public sector. The infrastructure sectors such as electricity generation, transport and communications were nearly the monopoly of the public sector. Public sector also entered industries such as automobiles, textiles, hotels and some of the consumer goods. The private sector in industry was tightly controlled with respect to the creation of new capacities

for production. Besides the control over production capacity or expansion, the economy was also subject to a variety of pricing controls. The 'administered prices' prevailed in sectors such as electricity, steel, petroleum products, fertilisers and pharmaceuticals. The banking sector was nationalised in 1969. It was only agricultural production and retail that were not directly in the hands of the public sector.

**Table 29. Share of Public Sector in GDP (Per cent)**

Plan Period	Industry (Mining+ mfg+egw+constr)	Agriculture & Allied	Services	Total
III 1961-66	14.52	2.14	24.38	11.57
IV 1969-74	18.95	3.24	32.57	16.42
V 1974-78	25.25	3.53	34.38	19.15
VI 1980-85	30.93	3.47	37.97	22.92
VII 1985-90	35.39	3.30	38.91	25.85
VIII 1992-97	33.83	2.78	36.41	25.66
IX 1997-00	32.63	2.49	36.12	26.40
1960s	15.07	2.44	25.86	12.45
1970s	23.12	3.48	34.22	18.58
1980s	33.16	3.38	38.44	24.38
1990s	33.65	2.77	36.70	25.97

Source: EPW (2002)

The 1990s saw a reversal of the emphasis on public sector. The VIII Five Year Plan noted that public sector had failed on efficiency front. The industrial policy of 1991 dismantled many of the controls on the private sector's expansion of capacities for production. Foreign investment norms were liberalised. Administered price regime was dismantled. The private sector was given a fair role in banking and finance.

The growth of public sector until the 1990s was based on several premises. The 'social control' over means of production was a consistent policy with reference to bringing about the 'socialistic pattern of society'. Secondly, mobilisation of large resources and investing in large projects quickly was believed to be outside the capability of the private sector. The public sector, however, began to be a burden on the economy's resources. Instead of contributing to the government's revenues for implementing various development programmes, the public sector began to claim resources for meeting its losses.

**Table 30. Gross Capital Formation as a Percentage of GDP at Current Prices by Type of Institutions**

Five Year Plan	Period	Public Sector	Private Corporate Sector	Household Sector
I	1951-56	3.54	1.34	5.02
II	1956-61	6.04	2.46	5.26
III	1961-66	7.54	3.36	4.70
IV	1969-74	6.72	2.28	7.20
V	1974-78	8.65	2.48	7.65
VI	1980-85	9.86	4.12	6.82
VII	1985-90	10.10	4.32	8.82
VIII	1992-97	8.04	7.40	8.00
IX	1997-02	6.6	6.2	9.7
	1950s	4.38	1.81	5.23
	1960s	6.96	2.77	5.68
	1970s	8.19	2.43	7.66
	1980s	9.98	4.22	7.82
	1990s	7.61	6.48	8.88

*Source:* EPW (2002)

The 1990s marked a beginning of the end of reliance on public sector in many areas of the economy. There is now an active programme of ‘disinvestment’ of government equity in a range of public sector enterprises.

### 3. Government Expenditures for Development

A dominant public sector in the production activity, restrictive trade and investment policies to regulate private sector and foreign commercial activity required government initiative in most spheres of economic activity. One way to judge the priorities of government initiatives is provided by the share of different sectors in government expenditure.

We first present the pattern of public sector outlay across the major sectors of the economy through the various five-year plans starting from the VFYP (Table 31). Although the sectoral classification of the expenditures does not fully capture the final impact of such expenditures on different sectors, they provide a first approximation. Also, while the share of a sector in the total outlay may have declined in some cases, there is generally an increase in the allocation in each successive Five Year Plan for all the sectors. The pattern does indicate increased spending towards infrastructure

sectors such as energy, transportation and communication over time.

There was a decline in the share of agriculture and industry in the 1990s and increase in infrastructure and services.

Social sectors including education and health services were a major concern in the various Five Year Plans. There was a step-up in such expenditures in the VI Five-Year Plan. However, since then the increase was not sustained till the VIII Five-Year Plan. In the VIII and the IX Five-Year Plans, the rates of government spending on social sectors increased significantly (Table 32).

**Table 31. Pattern of Capital Formation within Public Sector by Type of Industry**

Share ( Per Cent) of Industries in Public Sector GCF (at Current prices)						
FYP Period	Agriculture & Allied	Industry (Mining, Mfg, Construction)	Infrastructure (Power, Trans. Storage & Communication)	Other Services	Total	
III	1961-66	10.71	22.28	40.90	26.11	100.00
IV	1969-74	12.48	21.94	35.98	29.60	100.00
V	1974-78	11.95	29.06	32.59	26.40	100.00
VI	1980-85	12.19	27.81	35.39	24.62	100.00
VII	1985-90	8.66	27.85	40.11	23.38	100.00
VIII	1992-97	7.06	23.17	43.88	25.89	100.00
IX	1997-99	6.81	20.14	44.00	29.06	100.00
	1960s	11.24	24.67	37.06	27.04	100.00
	1970s	12.52	25.84	34.08	27.56	100.00
	1980s	10.43	27.83	37.75	24.00	100.00
	1990s	6.90	23.18	43.84	26.08	100.00

Source: EPW (2002)

#### 4. Regulatory Mechanisms

Constitutional provisions and legal requirements have been used to achieve various standards and norms needed for development programmes. For instance, a variety of environmental regulations have now been enacted to achieve the goals of environment protection and preservation. National Policies in the areas of agriculture, forest, health, education, energy provide for regulatory mechanisms to enforce the policies. India is also a signatory

**Table 32. Government Expenditure in the Major Sectors as Per Cent of GDP: Centre and States Combined**

FYP	Period	Agriculture & Allied	Infrastructure	Social Sectors	Others	Total Expenditure
V	1974-78	0.18	1.48	3.93	14.62	20.21
VI	1980-85	0.31	2.20	4.90	17.04	24.45
VII	1985-90	0.39	2.30	5.65	19.36	27.70
VIII	1992-97	0.37	1.87	5.03	17.59	24.86
IX	1997-02	0.40	1.98	5.58	18.22	26.18
	1970s					
	(from 1974-75)	0.19	1.63	4.11	15.16	21.09
	1980s	0.35	2.25	5.28	18.20	26.08
	1990s	0.37	1.95	5.17	17.67	25.15

Source: Government of India (2002a)

to many of the international multi-lateral treaties in the matters relating to environment, health, investment, trade and finance. The domestic laws and regulations have been framed to comply with the international agreements. We discuss briefly some of the national policies and regulations that have a bearing on sustainable development.

**(a). Environmental Acts/Legislation**

The major legislative action in the area of environmental protection came into force with the enactment of the *Water (Prevention and Control of Pollution) Act of 1974*. This legislation is comprehensive in its coverage of water pollution. The Central and State Pollution Control Boards were established under this Act. These boards prescribe standards for the discharge of effluent or the quality of the receiving waters. There are three types of effluent standards such as concentration based, waste-water generated per unit of output or input based and load based standards. The Act prohibits disposal of polluting matter in streams, wells and sewers or on land in excess of the standards established by the state boards. It stipulates that consent must be obtained from the state board before taking steps to establish any industry, operation or process, any treatment and disposal system or any extension or addition to such a system which might result in the discharge of sewage or trade effluent into a stream, well or sewer or onto land (Rosencranz *et al* 1991).

The 42<sup>nd</sup> Amendment of the Indian Constitution in 1977 enjoined both the state and the citizen to protect and improve the environment and

safeguard forests and wildlife.

Legislations relating to forests (*Forest Conservation Act 1980*), air quality [*Air (Prevention and Control of Pollution) Act 1981*] were followed by the comprehensive *Environment Protection Act (EPA) of 1986*. This Act provides a comprehensive mandate to the state to put in place measures to protect the environment.

The National Forest Policy of 1988 stipulated that 33 per cent of the land area of the country should be under forest cover. To enable preservation of forests and increase in the forest cover, the policy stresses the involvement of the communities and those who derive their livelihood from forests. Involvement of women in forestry programmes was also a strategic direction indicated by the Forest Policy of 1988.

There were also other significant developments with respect to the protection of environment in India. With the 73<sup>rd</sup> Amendment of the Constitution made in 1992, Panchayats are bestowed with the responsibilities in the area of soil conservation, water management, watershed development, social and farm forestry, drinking water, fuel and fodder, non-conventional energy sources and maintenance of community assets (TERI 1999). The National Water Policy was adopted in 1987 to ensure optimum though environmentally sound utilisation of water resources and deal with the high pollution levels (TERI 2000). Another significant development was the tightening up of laws to deal with the risk involved while handling hazardous substances. The Hazardous Waste (Management and Handling) Rules 1989, the Manufacture, Storage and Import of Hazardous Chemical Rules 1989 and the Public Liability Act 1991 were passed in this respect.

The Government of India has also incorporated the spirit of Agenda 21 of the Earth Summit in Rio de Janeiro in June 1992 which aims at integrating environmental imperatives with developmental aspiration in the form of two policy statements. They are the policy statements pertaining to Abatement of Pollution and National Conservation Strategy. The former draws attention to the changed stance within the environment sector such that the development and promotion of voluntary initiatives for protection and improvement of the environment through the use of incentives is simultaneous to development of the regulatory and legislative framework. These incentives may be fiscal or financial with the intention of encouraging cleaner technologies and production practices and deterring the use of harmful and polluting practices (Kuik *et al* 1997). The Policy Statement for the Abatement of Pollution recommends the polluter pays principle, involvement of public in decision-making and new approaches for considering

the market choices 'to give industries and consumers clear signals about the cost of using environmental and natural resources' (Sankar 2001). The measures for abatement of pollution include strengthening and extending the activities of the Central Pollution Control Board and insisting the polluting units to submit environment statement. The submission of environment statement is expected to enable the units to take a comprehensive look at their industrial operations and facilitate an understanding of material flows and focus on those areas where waste reduction and consequently saving of input cost is possible, etc.

IX FYP promoted the development and adoption of clean technology including waste re-use and recycling. It proposed strengthening environmental database. Development of standards, pollution monitoring and review were to be carried out as a continuous process. Economic instruments were also to be used with regulatory measures for pollution abatement. This includes enhancement of cess rates on water consumption, duty concessions on import of certain pollution control equipment, accelerated depreciation on pollution abatement equipment.

The National Conservation Strategy and Policy Statement on Environment and Development which was brought out in 1992 laid guidelines for integrating environmental considerations into India's process of development. According to the policy statement, carrying out of environmental impact assessment of all development projects right from planning stage was made mandatory. Projects above certain size and in certain ecologically sensitive areas were to get prior environmental clearance, environmental safeguards, and protection measures were to be incorporated in policies and in the implementation of developmental projects, create environmental consciousness through education and mass awareness, etc.

The National Conservation Strategy proposed surveys by the Botanical Survey of India (BSI) and Zoological Survey of India (ZSI) aiming at the conservation of endangered species. Biodiversity Conservation schemes were initiated during 1991-92 for ensuring proper co-ordination among various agencies concerned with the issues relating to conservation of biological diversity and to review, monitor and evolve adequate policy instruments for the same. Other ongoing programmes in the context of environmental protection are the National River Conservation Programme, afforestation and eco-development programmes, Wasteland Development programme. Under the IX FYP, the programmes are classified as issue specific, area and sector specific. Issue specific programmes include the mobilisation and involvement of people in environmental protection,

strengthening of the surveillance and monitoring system, preparing reports on the state of environment, integrating environmental concerns with decision making and natural resource accounting. Among the area specific programmes are National River Conservation Programme (NRCP), National Lake Conservation Programme, Taj Trapezium, Himalayan Region, Island and emphasis on Coastal Zone Regulation. Sector specific programmes include, the strengthening of the Central Pollution Control Board, progress of Industrial Pollution Control and Prevention Projects with external assistance, setting up of the Common Effluent Treatment Plants (CETP), schemes for promoting the adoption of clean technologies by small scale industries, preparation of environmental statistics and mapping. Other sector specific programmes are environmental impact assessment and development and promotion of clean technologies, conservation and survey, conservation of biosphere reserve, mangroves, wetlands and biodiversity along with encouraging research, environmental training and information. The Environment Action Programme 1993 was launched with the objective to prepare a 'blueprint' for integrating environmental concerns into the development process. The intention is to formulate a blueprint that is dynamic and holistic and promote a decentralised system of environmental management.

***(b) International Environmental Conventions and India***

India has favoured the policy of multi-lateral approaches issues of global concern. In the area of environmental protection also India has taken an active role in synergising India's position with the global agreements. The international environmental issues can be classified under four major areas such as depletion of ozone layer, green house gases, loss of biodiversity and trade related issues. The Montreal Protocol on substances that deplete the ozone layer was signed in 1985 and came into force in January 1987. The aim of the Protocol is to protect the stratospheric ozone layer above the earth. India acceded to the Protocol in 1992. In 1993, India prepared a detailed country programme to phase out ozone depleting substances (ODS) in accordance with the national industrial development strategy. Efforts to address the issues relating to climate change at the international level began during the mid-eighties. The UNEP and the World Meteorological Office established the Intergovernmental Panel on Climate Change (IPCC) in 1988. The objective of the Framework Convention on Climate Change (FCCC) was to achieve stabilisation of green house gases (GHG) concentrations in the atmosphere at safe level. In 1997, parties to the FCCC made progress in forging an international climate policy regime under Kyoto Protocol.

The Convention on Biological Diversity was signed at the time of Rio Conference in 1992. India with its phyto-geographical and agro-ecological diversity is a rich depository of biological resources. It is one of the twelve mega biodiversity centres in the world. However, India's biodiversity is under threat from various sources. India is a signatory to Convention on Biological Diversity (CBD) which came into force in December 1993. Besides, the MoEF has also initiated a project under the GEF (Global Environment Facility) programme called as National Biodiversity Strategy and Action Plan (NBSAP).

India is also signatory to the 1989 Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (Srivastava, 1999). The Basel Convention requires countries to ensure that hazardous wastes and hazardous recyclable materials are managed in an environmentally sound manner. Other international conventions in which India is a part include the Ramsar Convention for the Conservation of Wet lands of International Importance, Convention for Combating Dessertification and the International Trade in Endangered Species of Wild Flora and Fauna.

### ***(c) Regulatory Concerns in the Use of Natural Resources and Preservation of Environment***

#### ***Land Degradation and Soil Loss***

Soil erosion has been identified as the most serious cause of land degradation. It is estimated that India loses about 5,310 million tonnes of top soil annually and that around 130 million hectares of land (45 per cent of the geographic area) is affected by serious soil erosion (Ninth Five Year Plan). It is also noted that agricultural practices like increased use of nitrogenous fertilisers affect the water quality indirectly. Through leaching, nitrate finds its way into groundwater, which is a threat to potable water quality. While the maximum permissible limit of nitrate content as laid down by WHO is 100 mg/litre, studies have shown that in some parts of India the nitrate content of dug wells was higher than the permissible limits. Not only that adverse impacts of pesticide use was also observed in the water (TERI 2000). In India, 133 pesticides have been registered for regular use, of which 34 are either banned or restricted in other countries (CPCB 1994).

#### ***Forests, Wildlife and Biodiversity***

Forests play an important role in environmental and economic stability. Although the National Forest Policies of 1988 stipulates that 33 per cent of the land of India should be under forest, India's total forest area is about 23.28 per cent of the total geographical area. It has been reported

that the quality of forests (crown density) has declined over the decades though the area under forests has remained practically the same. The Forest Survey of India (1999) reports that only about 11.48 per cent of India's total geographical area is under dense forest (crown density of 40 per cent or more), 7.76 per cent is open forest (crown density between 10 and 40 per cent) and roughly about 0.15 per cent constitutes mangroves. The forests are major sources of supply of timber, fuel wood, fodder and a wide range of non-wood products, is a natural habitat for biodiversity and repository of genetic wealth, play an integral part of the watershed to regulate the water regime, conserve soil and control floods, carbon sequestration and carbon sink. However, it has been noted that the forest resources in India are under tremendous pressure. Intensified shifting cultivation, indiscriminate removal of timber, fuel wood, fodders and other forest produce, forest fire and encroachment have led to degradation and deforestation. It has been noted that the forests meet nearly 40 per cent of the country's energy needs and 30 per cent of fodder needs. It is estimated that about 270 mt of fuel wood, 280 mt of fodder, over 12 million m<sup>3</sup> (cubic meter) of timber and countless non-wood forest products are removed from forests annually. Efforts at participatory forest management were also taken with the introduction of Joint Forest Management (JFM) since early 1990s. So far, 27 states have issued orders enabling the setting up of a mechanism for public participation in the management of forests, and 62,890 JFM committees have been established (Planning Commission 2003).

#### Water Quality

The important substances which pollute water have been identified as traditional organic waste, waste generated from industrial activity, chemical agents for fertilisers and pesticides for crop protection and silt from catchments. The types and sources of water pollution include both point and non-point sources. A survey of 241 Class II towns in 17 states in India undertaken by the CPCB indicates that, on an average, 90 per cent of the water supplied is polluted and that only 1.6 of the total polluted waste water gets treated (CPCB 1990). Drinking water standards for India were set up by the Indian Council of Medical Research and are similar to the World Health Organisation Drinking standards. The Central Pollution Control classifies the surface water into five categories such as A, B, C, D, and E in decreasing order of quality. Discharge of industrial effluents are regulated through Indian Standards Codes such as IS:2490 (1974) for discharges into inland surface waters, IS:3306 (1974) and IS:3307 (1974) for discharges on land for irrigation and so on (TERI 2000; IX FYP). The Central Pollution

Control Board has been regularly monitoring the water quality in all the major rivers at 402 locations under the MINARS (Monitoring Indian National Aquatic Resources Systems), 51 locations under global environmental monitoring systems, 27 locations under Ganga Action Plan and 134 locations for groundwater. It has been observed that the water quality of almost all major rivers in India is increasingly deteriorating.

#### Air Quality

Under the *Air (Prevention and Control of Pollution) Act 1981*, India has set ambient air quality standards. The standards, which were based on eight-hourly average time, were revised to 24-hourly standards in 1994. The standards are set for sulphur dioxide, oxides of nitrogen, suspended particulate matter, respirable particulate matter, lead, carbon monoxide and ammonia. It has been noted that six of the largest cities in India have severe air pollution. Annual average levels of total suspended particulate matter (SPM) in these cities are at least three times the WHO standard. The CPCB has been regularly monitoring the ambient air quality at 290 locations spread over 92 cities and towns. It is also observed that more than 90 per cent of the national monitoring stations record particulate concentrations exceeding  $75 \mu\text{g}/\text{m}^3$ , the recommended WHO standard (TERI 2000).

Noise that has been previously considered only as a nuisance is now considered as a pollutant. The CPCB notified the ambient noise standards in 1987 under *the Air (Prevention and Control of Pollution) Act 1981*. However, studies of noise levels conducted in a few major cities seem to indicate that these levels are barely within limits in industrial zones but due to vehicular noise, the pollution limits in residential, silence, and commercial zones are being increasingly challenged everyday (MoEF 1999 cited in TERI 2000).

#### Industrial Emission

Emissions from industries are of two forms-particulate emissions such as SPM and gaseous emissions such as sulphur dioxide, oxides of nitrogen and carbon monoxide. Heavily polluting industries are included under the 17 categories of highly polluting industries for the purpose of monitoring and regulating pollution. There were 1,551 industrial units in the country falling under the 17 categories of highly-polluting industries as on 31 March 1996 (TERI 2000).

#### Vehicular Emissions

The share of vehicular pollution in urban areas is reaching alarming proportions and emission standards were first set in 1986. These were later

revised in 1987 and 1989. Petrol-driven vehicles are a major source of carbon monoxide emissions contributing over 85 per cent; diesel vehicles contribute over 90 per cent of emissions of oxides of nitrogen. The standards for petrol-driven vehicles for carbon monoxide are 3 per cent for two and three wheelers and 4.5 for four wheelers. The standards for diesel-driven vehicles specify limits for smoke as 65 Hatridge units (TERI 2000). These are emission standards with reference to volume of air.

#### Indoor Pollution

Indoor air pollution is a critical issue and the pollutants of concern are suspended particulate matter and carbon monoxide. Studies related to indoor pollution show that concentration of SPM during a cooking session varies from 3-6 mg/m<sup>3</sup> and that of carbon monoxide from 5-50 parts per million. Women in rural households have to cope with a daily pollution load equivalent to spending 1 hour in a room that has 40 mg of SPM for every cubic metre of air as against a value of 1.2-3.0 mg recommended by WHO (TERI 2000).

#### Power

Thermal power constitutes about 72 per cent of the total installed power generation. Increasing reliance on thermal power leads to many environmental problems since India's coal is very high in ash content and its disposal poses a major problem. The Ministry of Environment and Forest in a notification issued in 1997 made it imperative for thermal power plants to be located beyond 1,000 km from coal pit head or in urban sensitive or critically polluted areas to use coal with an ash content lower than 34 per cent.

#### Solid Waste

The amount of municipal solid waste (MSW) generated in most Indian cities is increasing rapidly. The per capita quantity increases with the size of the city and varies between 0.38 and 0.65 kgs per day. In metropolitan cities, values up to 0.5 kg per day have been recorded. Per-capita waste generation is also increasing over the years at the rate of 1.33 per cent (CPCB 1999). It is also estimated that the hazardous waste generated from industrial sector is of the order of 7.2 million tones annually, of which approximately about 1.4 million tones is recyclable waste, 0.1 million tonne is incinerable and 5.2 million tones is destined for disposal at landfills (MoEF 2000). The industries that generate huge quantities of waste are thermal power stations and iron and steel plants. On the whole, it is seen that environmental awareness and the measures to protect environment have been increasing in India over the years.

## CHAPTER III

### DEVELOPMENT AND SUSTAINABILITY PERSPECTIVES

#### 1. Agriculture and Sustainable Development

Agricultural development has been an important goal of economic policies in India given the importance of the sector in generating income, providing employment and promoting food security for a populous nation. The policies for the sector have dealt with the whole range of production, marketing, prices and technology. Low productivity either in terms of output per unit of land or labour has been the focus of many of the agricultural development programmes. In fact, raising agricultural productivity has been a goal of policies for its poverty alleviating impact. In the first two decades of planning, expansion of crop area was possible to increase crop output. However, as limits to further expansion of crop area were experienced, productivity improvements to raise output became imperative. Table 33 summarises the growth experience of different sub-sectors in agriculture and allied sectors during the period since 1950-51.

**Table 33. Growth Rates of Agricultural Production:  
Per Cent Per Year**

Year	Crops	Rice	Wheat	Other Cereals	Pulses	All Food Grains	Non-Food Grains	Milk	Eggs	Meat
1952-63	3.65	4.15	4.99	3.68	2.41	3.70	3.50	1.21	3.70	1.58
1962-73	2.30	1.87	8.28	0.71	-0.89	2.44	2.01	1.57	3.47	-0.24
1972-83	2.50	2.16	4.50	1.23	0.54	2.39	2.70	4.85	6.66	2.59
1982-93	3.32	3.70	3.70	1.68	1.72	3.14	3.71	5.18	7.07	5.66
1992-02	2.89	3.02	3.67	1.97	0.66	2.53	3.43	3.78	13.97	-0.78

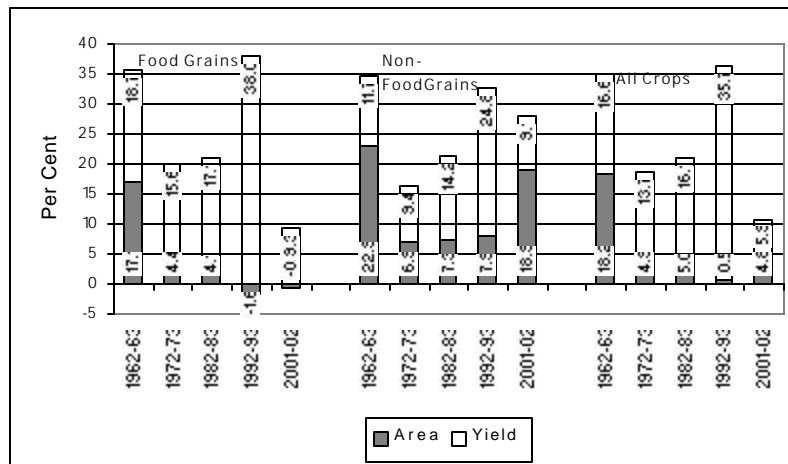
*Note:* Crop output growth rates are based on indices of output between the 3-year averages of end points of the period. In the case of non-crop items the output is the value of output in constant prices.

*Source:* Chandhok (1990b); Government of India (2003) and EPW (2002)

In order to highlight the relative importance of contributions from productivity improvement to output growth, the crop output changes are decomposed into contributions from crop area and crop yield. The increasing significance of productivity improvements to the growth of crop output, emerging from this decomposition analysis is illustrated in Figure 18. The percentage changes in crop area and yield per hectare during the selected 10-year period are presented for food grain, non-food grain and all crops

combined. In the case of food grains, area increase was significant only in the 1950s. In the 1980s and 1990s, contribution of area to output changes was actually negative. The declining crop area under food grains was offset by the rise in crops area under non-food grain crops. Thus, at the all crops level, both area and yield contributed by nearly the same proportion to output growth in the 1990s. An important point that emerges from the pattern of crop yield and area changes in Figure 18 is that in the 1980s, nearly all the increase in crop output was from productivity improvement whereas productivity improvement dropped dramatically in the 1990s.

**Figure 18. Decomposition of Crop Output Growth: Per Cent Change in Crop Output and Area**



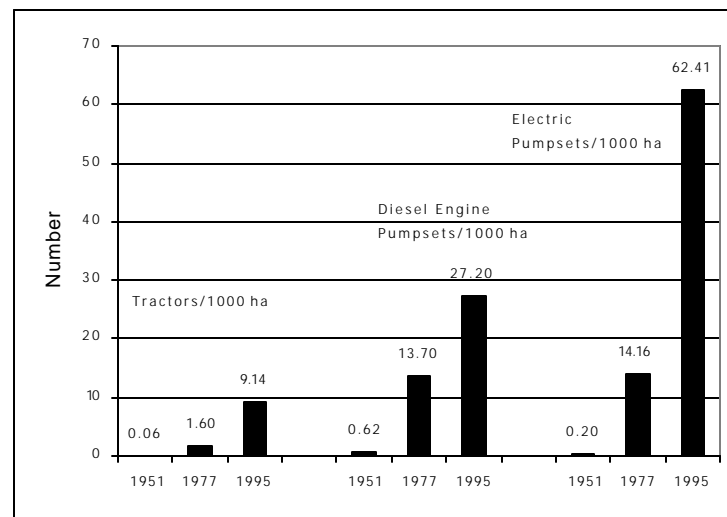
Source: Chandhok (1990b) and Reserve Bank of India (2001) and EPW(2002)

In the 1970s and 1980s, the 'green revolution' led to increase in crop yields through application of a package of inputs of new seeds of high yielding crop varieties, irrigation and chemical fertilisers. The improvement in crop yields was dramatic in the case of wheat. Market support in the form of minimum support prices, procurement of foodgrain by the government and the technology-push led to increase in foodgrain output. Expansion of irrigation, area under high yielding varieties and market support led to the growth of output of other crops also. India has achieved 'self-sufficiency' in food through agricultural growth even as it has crossed the 1 billion population mark. Agricultural commodities account for 15 per cent of the total merchandise exports from the country.

The dramatic changes in the use of inputs are illustrated in Figures 19 and 20. From insignificant levels of mechanisation in the 1950s and

1960s, use of tractors and irrigation pump sets has grown considerably by the mid-1990s (Figure 19).

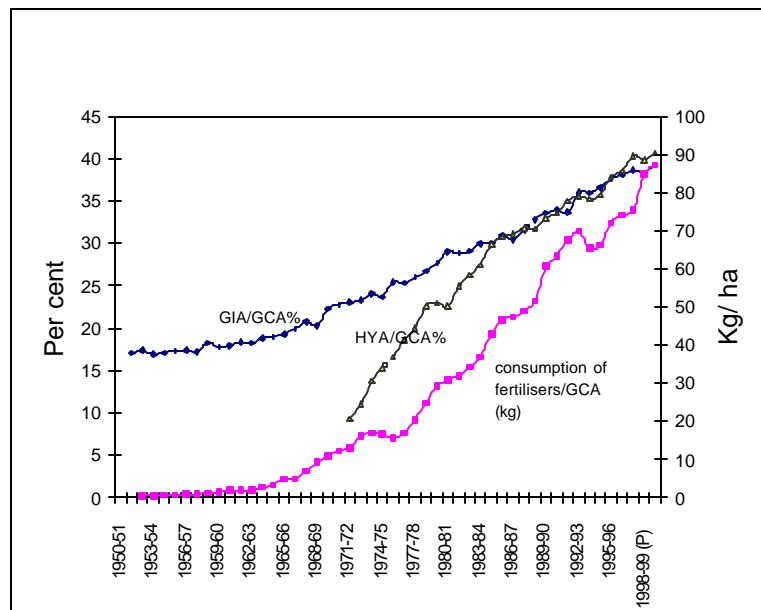
**Figure 19. Growth of Machinery Use in Agriculture: Tractors and Pumpsets**



Source: Government of India (2001c)

Besides the marketing support public investment in irrigation facilities, credit subsidy and other input subsidies were important components of agricultural policies that promoted green revolution. Use of fertiliser consumption increased as irrigated area and area under high yielding varieties rose through the 1970s (Figure 20). There has been a debate over the role of price and non-price factors in promoting the use of modern inputs in Indian agriculture. Increase in irrigated area, the spread of use of high yielding varieties of crops and the expansion of supply networks for inputs were among the major non-price factors that helped raise the use of chemical fertilisers. But, as the experience in the mid-1970s early 1990s shows (Figure 20), fertiliser consumption per hectare saw a decline or stagnation in a period when input prices experienced sharp rise.

The reliance on a package of yield enhancing chemical inputs will have its impact on water and land resources unless such usage is balanced with the need for preserving the quality of resources and also the given stock of natural resources. There is rising evidence of over exploitation of ground water resources and also use of chemical pesticides at excessive levels.

**Figure 20. Growth in Irrigation, Fertiliser and HYV Seeds**

*Note:* GIA/GCA = ratio of gross irrigated area to gross cropped area, HYA/GCA = ratio of area under high yielding varieties of crops to gross cropped area, and the fertiliser consumption is in terms of major nutrients (N, P and K) per hectare of gross cropped area.

*Source:* Government of India (2001b)

The achievements in terms of output growth, thus, have not come without some concerns regarding sustainability of growth. Some of the economic issues are:

- budgetary and other subsidies for agriculture are contributing to fiscal imbalances and may in fact be adversely affecting public investment in the sector. In other words, strategies that encourage the use of subsidised inputs are becoming unsustainable. There is, therefore, a need to evolve approaches that can provide incentives to improve productivity on a sustainable basis. Adequate user charges or prices for inputs such as irrigation water, electricity and fertilisers will make the provision of these inputs sustainable and at the same time will ensure better quality of supplies to the users;
- improving productivity and efficiency of inputs on a constant basis will be essential for competing in a globalising economy. To constantly improve productivity, bringing new technologies not only in production but in harvesting, processing and marketing would

be necessary. Reducing post-harvest losses in output, improving packaging and processing for new markets require private investment. Partnerships between farmers and the corporate sector to realize investments for achieving growth for Indian agricultural output in global markets will be needed;

- a related issue is the viability of small-producer agriculture in the context of investments needed for greater productivity. Again, the need for organisational structures that provide economically viable support for efficiency improvements of the small farms is obvious; The issues relating to sustainable use of natural resources are:
- the need to preserve and enhance the land resources. Degradation of land quality that is taking place either due to irrigation that leads to water-logging, salinity and alkalinity, practices that lead to soil erosion.
- the need to use water resources more efficiently and judiciously. In many regions, the groundwater table is declining alarmingly as larger proportion of crop land is brought under irrigation. Without adequate attention to preserving water resources, damage may be done to further output by this excessive exploitation of water resources;
- impact of intensive agricultural production on environment, particularly in terms of the quality of water resources. Water run-off from farm land takes along chemical fertiliser residues and other chemicals if used in farming, through drainage systems to streams, rivers or other water bodies. Adequate checks to minimise the pollution of water bodies farm lands would be important to improve water quality for other uses; and
- use of chemical pesticides, if indiscriminate, can affect other forms of life adversely. Even the farm output may contain residues that are harmful to health. Thus, while protection from pests is necessary, the use of chemicals needs to be judicious.

These issues relating to sustainable development of agriculture have received attention in government policies. A recognition of the issues is evident in the goal of National Agricultural Policy of 2000 which seeks to achieve an output growth in excess of 4 per cent per year which is sustainable technologically, environmentally and economically. The growth should be efficient in the use of resources while conserving soil, water and biodiversity. It should be demand-driven, cater to domestic market and maximise benefits from export of agricultural products in the face of the challenges arising

from economic liberalisation and globalisation. It is necessary for the policies to enable quick application of modern communication, financial and information technology innovations to agriculture at the farm level to provide additional sources of efficiency to the sector. Without greater efficiency the small farm agriculture will find it increasingly difficult to compete in the global markets.

## **2. Industry**

Industrial growth provides diversification of activities in a developing economy. As a source of new employment opportunities, improving productivity in traditional agrarian sector of the economy and providing linkages to the global markets, industrial development is a part of the paradigm of economic growth and development. In the Indian planning process, industry was accorded an important role in leading India to becoming a modern economy. Industrialisation was sought to be achieved with the heavy industries and capital goods industries being given precedence over other industries in the FYPs. Public sector was given a prominent role in industrialisation. The industrialisation strategy also involved import–substitution. Thus, the policies sought to achieve a particular type of industrial development at a viable pace. The limitations of the strategy became evident by the 1980s. The pace of industrial growth was slow in comparison to the fast growing developing economies of East and South-East Asia. The consumer was deprived of quality industrial output and the price was high for the produce.

Beginning slowly in the mid-1980s, vast changes in industrial policy were brought about in the 1990s. The New Industrial Policy of 1991 heralded a new policy regime for Indian industry. Abolishing the quantitative restrictions on investments industry, the new policies sought to bring about new dynamism into industrial development. Public sector monopolies gave way to competitive environment. Liberalisation of trade barriers brought in global competition. The change in policy regime has been a part of the overall process of economic reforms India which began in the early 1990s.

The deceleration in industrial output growth is evident when we compare the annual average rates of growth during the period of the 1980s and the period from 1992-93 to 1999-2000 (Table 34). The period of 1990s (1992-2000) was a transition from a regime of protected and ‘controlled’ industrial policies to one of more competition. The transition required adjustments in capacities of production, technology and operations. A key change that is discernible from Table 34 is the sharp decline in the output growth of capital goods. Although consumer durables also grew at a slower

pace, the 1990s growth still remained at close to 10 per cent per year. The capital goods sector saw greater competition from imports and it also witnessed slower investment spending in the industrial sector. The consumer goods, on the other hand, saw capacity restrictions being removed while protection from imports remained fairly high.

**Table 34. Rate of Growth (%) of Industrial Output (Index of Industrial Production)**

Item	1980-90	1992-00
General	7.80	6.16
Mining & quarrying	8.77	3.38
Manufacturing	7.46	6.41
Electricity	9.15	6.70
Use- based classification		
Basic goods	7.99	6.05
Intermediate goods	6.05	7.26
Capital goods	10.96	5.32
Consumer durables	14.23	9.60
Consumer non-durables	5.44	5.10

*Source:* Chandhok (1990b); RBI (2001)

The motivation for initiating and continuing with the reforms is to make faster economic growth sustainable. In the context of industrial growth also, the reforms have sought to bring about a sustainable growth in the sector. While the process of restructuring of industry in response to the reforms in policy continues, we draw attention to one of the distinct features of development policies relating to industry that have a relevance to sustainability of the growth process.

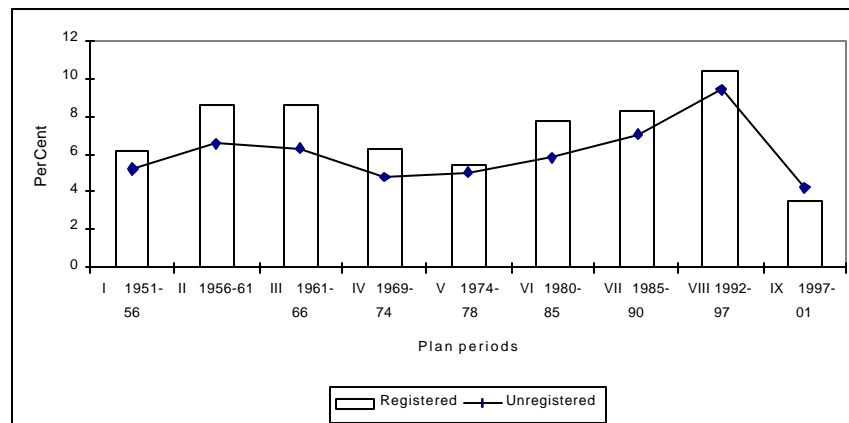
**(a) The Small Scale Industries (SSIs)**

The small-scale industries, broadly defined, have been given a distinctive role in India's industrial policies. The Industrial Policy Resolution (1956), one of the early policy statements of independent India, noted the key benefits of small scale industries: (1) employment generation, (2) greater possibilities of wider regional spread of industries and (3) greater flexibility or adaptability in response to market fluctuations.

There are alternative definitions of small-scale industries adopted for different purposes. For instance, there are the village or traditional industries, which include handlooms, handicrafts, sericulture and coir. Then

there are the modern SSIs, which cover various engineering manufactures and power looms. For the purpose of providing fiscal and other benefits under the government policies, SSIs are defined based on the volume of their fixed assets, although the cut-off value has varied over time generally moving up to provide some benefits of greater scale economies. Finally, the ‘unregistered’ manufacturing units are taken to reflect the ‘small scale industries’ in the economy although this definition is based on the number of employees per establishment. Taking the last of the definitions to begin with, the unorganised sector contributes a significant share of the industrial sector, particularly manufacturing. Although the share is declining, it is still as much as 30 per cent of the manufacturing value added (Figure 21).

**Figure 21. Growth in Manufacturing Value Added: Per Cent Annual Averages During the FYPs**



Source: EPW (2002)

The government policies have attempted to encourage the small scale industries by providing a variety of benefits. The SSIs have enjoyed fiscal benefits in terms of lower taxes than the larger units, they also have received credit from the banking and financial institutions at a lower rate of interest than available to industry, in general. The government has also sought to provide infrastructure facilities such as developing the roads and communication facilities, power and transport to the clusters of SSIs. The government policies have also provided support for technology upgradation including Research and Development activities.

An important policy that promoted SSIs was that of product reservation. There has now been a move to steer away from such policy given the liberalised trade regime where small scale industry now must

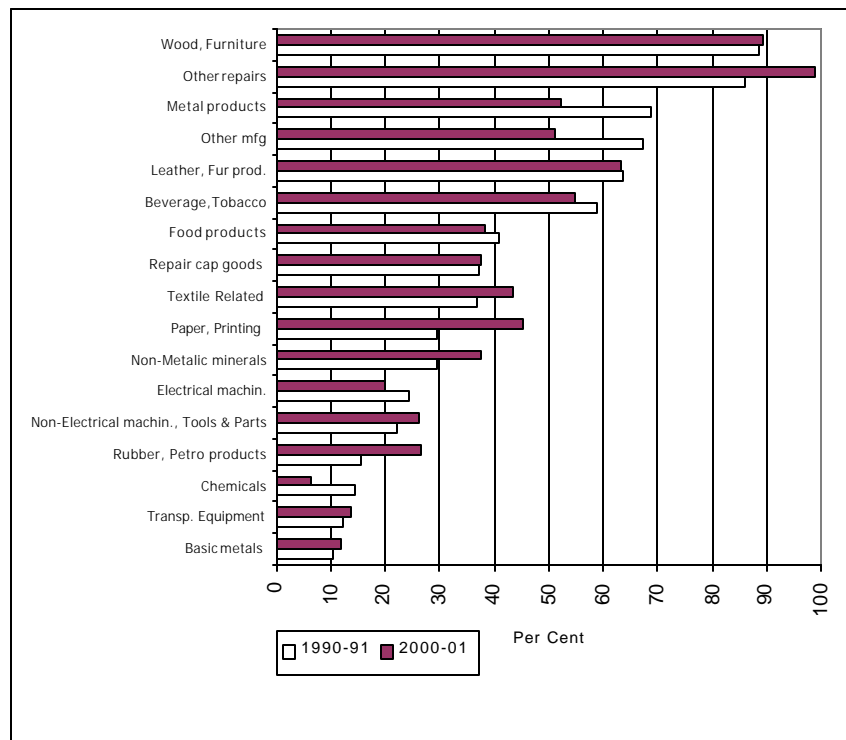
compete with small or large import suppliers. The significance of SSIs in Indian industry is evident from its contribution of 40 per cent of value added in manufacturing. It is estimated to provide 35 per cent of India's exports of manufactured products. It also provides employment to 20 million people.

The presence of unorganised sector in different segments of industries is illustrated in Figure 22. The 'unregistered'<sup>4</sup> sector accounted for over 80 per cent of the value added in two sectors, viz., wood, furniture and products, and 'other' repairs (repairs other than repairs of capital goods), in both 1990-91 and 2000-01. The shares of unregistered sector ranged between 50 and 70 per cent of the value added in the case of metal products, 'other manufacturing', leather and fur products, and beverages, tobacco and tobacco products in both the reference years noted above. It is the relatively less capital intensive sectors that attract smaller enterprises. Registered sector dominates with more than a share of 70 per cent of value added in the case of manufacture of machinery, rubber and petroleum products, chemicals, transport equipment and basic metals.

The relative importance of different segments of manufacturing to unorganised sector is provided in Figure 23. Textile related (textiles and products) industries account for the largest proportion of value added within the unregistered manufacturing. Four sub-sectors of manufacturing (inclusive of repairs services) accounted for about 50 per cent of output of unregistered manufacturing. There has been some rise in the share of some sub-sectors such as 'other manufacturing' and 'metal products' within unregistered sector in 2000-01 as compared to the structure in 1990-91. The sharp decline in the share is in beverages, tobacco and tobacco products; wood, furniture and products; and rubber, petroleum and products.

The new industrial policy regime that has reduced protection from imports through lowering trade barriers and reduced protection to SSIs from competition from large scale producers, has had an adverse impact on this sector. There is, however, a growing recognition that SSIs would have to grow based on their own intrinsic strengths such as flexibility in location and quick adaptability to changing market conditions. Product specific policy support to SSIs is unlikely to benefit the economy in an era of liberalised trade and industrial policies. It is the complementarity of large, medium and small industries that is likely to provide greater opportunities for the SSIs in the future.

**Figure 22. Share (%) of Unregistered Manufacturing in Sectoral GDP**



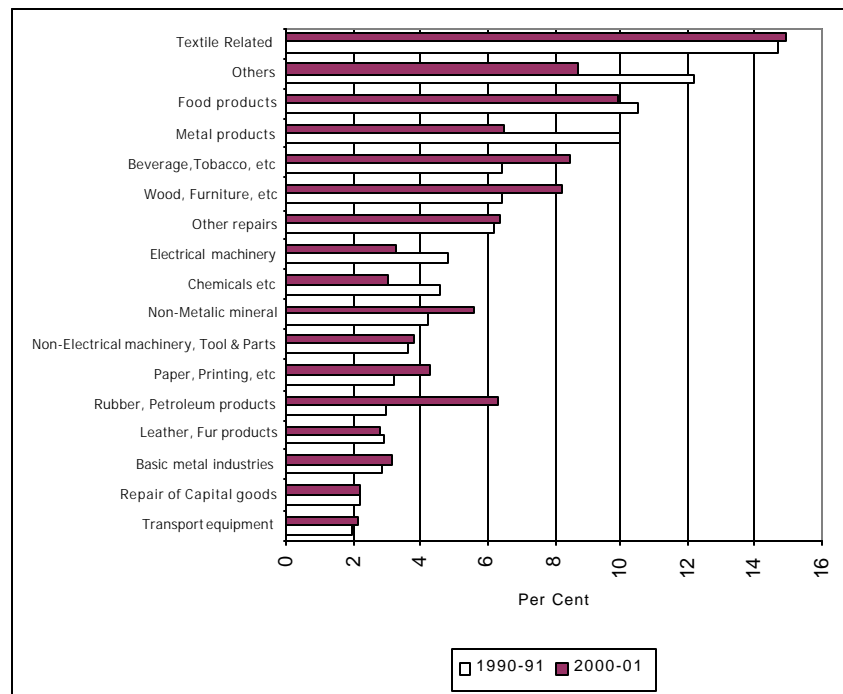
Source: EPW (2002)

The government policies now actively support adoption of pollution control measures by the SSIs. The government now reimburses the expenses incurred for obtaining ISO 4001 Environment Standard. This is an expansion of the scheme for technology upgradation where expenses incurred for achieving ISO 9000 standard are reimbursed. The IX Five Year Plan provided focus on industries based on fruits and vegetable processing, livestock products and fisheries within the 'food processing industry' as potential areas for the expansion of SSIs.

#### **(b) Industrial Pollution Control**

With the expansion of industry in the economy, the need for adequate institutional mechanisms to monitor and regulate the environmental impact of industrial activity has been recognised. A beginning for legislative activities and institutional building for environmental regulation has been made in the wake of the Stockholm Conference in 1972. The enactment of *Water*

**Figure 23. Distribution (%) of GDP from Unregistered Manufacturing across Sectors**



Source: EPW (2002)

*(Prevention and Control of Pollution) Act of 1974* and *Air (Prevention and Control of Pollution) Act of 1981* were the initial measures adopted to control pollution. The Bhopal Gas Tragedy of 1984 has been a turning point in the evolution of environment policy in India and led to further spate of legislative activity and tightening up of environmental law in India. Since the Bhopal Gas Tragedy involved the handling of risk from a hazardous substance, the Hazardous Waste (Management and Handling) Rules 1989, the Manufacture, Storage and Import of Hazardous Chemical Rules 1989; and the *Public Liability Insurance Act 1991*, were passed to tighten up the law in this respect. The Policy Statement on Abatement of Pollution 1992 further emphasised the integration of environmental considerations into decision-making at all levels and lists different areas where pollution problem is grave and that needs to be tackled on a priority basis.

Presently, the Ministry of Environment and Forests, which is the apex policy making body in the field of environment, acts through the central

and state pollution control boards for implementing pollution control laws. The important regulatory instruments used in pollution control or prevention mechanism are (a) No Objection Certificate; (b) Consent and (c) Standards. *No Objection Certificate* is required in the case of new industries and is essentially a site clearance to be obtained by the entrepreneur from the concerned state pollution control board for the proposed project. The certificate is to be issued after considering the impact of the proposed project on the specified environment, topographical and climate features, biological diversity in the area, compatibility with land use, proximity to protected areas and to human settlement. After the completion of the project and before commissioning the industrial process the entrepreneur is required to take consent. *Consent* is given subject to the installation of all required pollution control equipment to abate pollution. *Standards* refer to specific parameters previously quantified with respect to measures for disposal, discharge and emission of solid, liquid and gaseous waste into the environment (Kuik *et al* 1997).

The pollution control boards have necessary powers to enforce pollution standards and compel industries to adopt either clean technologies or clean-up technologies whichever seems to be appropriate. Three major types of emission standards such as concentration based (eg., suspended particulate matter, fluoride), equipment based (eg., for control of sulphur dioxide emissions) and load/mass based (prescribed for industries such as fertiliser, copper etc) standards are prescribed (Sankar 2001).

The government has categorised industries into 'Red', 'Orange' and 'Green', according to the descending order of the level of severity of pollution generated by industries (Kuik *et al* 1997). It should be noted that the government had identified several industries as highly polluting and they have been asked to install the required pollution control equipment and action has been initiated against the violators. Out of the total 1,551 large and medium units identified in 1992 in the 17 categories of highly polluting industries, 1,349 industrial units have installed the requisite pollution control equipment, 179 units have been closed down and 23 units have yet to install the necessary pollution control facilities (as on June 30 2002). (Government of India 2003). The Economic Survey 2002-03 observes that out of 726 industrial units along the major rivers and lakes in the country, which have been found discharging their untreated or partially treated effluents into the freshwater bodies including rivers and lakes, as on September 30, 2002, only 409 firms were complying with the prescribed standards and 178 had ETPs which were not operating satisfactorily. Three industrial units were

getting their ETP installed and 130 industrial units had been closed down. Only six units have not installed the requisite pollution control facilities.

However, it may be noted that small industries confront several problems for controlling pollution because of their smaller size, insufficient technical knowledge, financial bottlenecks and even limited managerial capabilities. All these are serious impediments for treating effluent by individual units. Common effluent Treatment Plants have been advocated as a cost-effective solution for compliance with the standards for small-scale polluting units in the industrial clusters/ estates. The MoEF, with the assistance of World Bank under the Industrial Pollution Control Project (IPCP), initiated a scheme to provide financial assistance to clusters of small scale industries constructing such CETPs. This scheme, which operated from November 1992 to end of March 1999, has resulted in the construction of a large number of CETPs spanning the entire country.

Besides the above measures, submission of an Environmental Statement by polluting units has been made mandatory. The Environmental Statement enables the units to take a comprehensive look at their industrial operations and facilitates understanding of material flows and focus on areas where waste reduction and consequently, savings in input cost is possible.

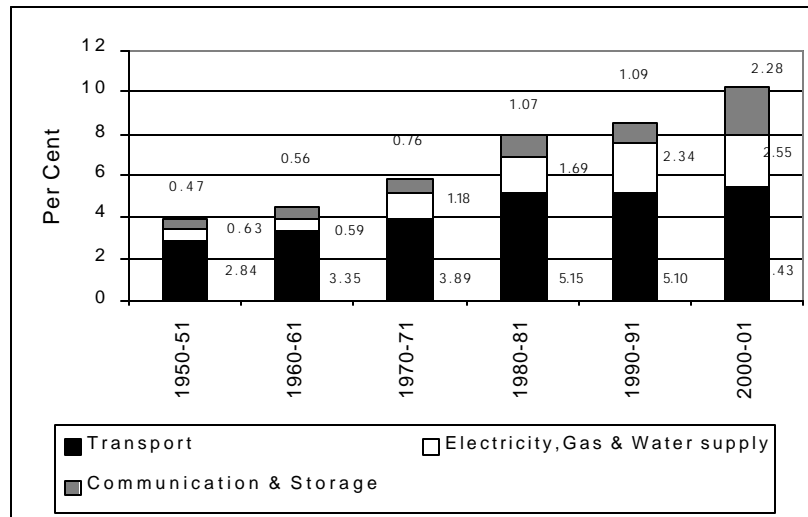
### **3. Infrastructure Development**

Physical infrastructure such as roads, railway, airports, ports, power supply and communications is the lifeline of an economy. Added to this list we often see water supply and sanitation. These are the intermediate services essential for the conduct of production and commerce. Inadequate infrastructure services in terms of quantity and quality can create serious bottlenecks for economic activity. These services also have an impact on the quality of life. Recognition of the importance of these services in economic growth and development led to substantial provision of public resources for investment in these sectors. The share of energy, transport and communication in public sector outlay has been around 25 per cent in the Five Year Plans. The trends in the output of infrastructure sectors, in terms of GDP in constant prices are summarised in Figure 24.

In terms of output, there has been a growth of infrastructure output over the years. However, the adequacy of infrastructure services has always been a concern, especially with the opening up of the economy to import competition. The trends in infrastructure development in terms of physical indicators are provided in Table 35.

One of the main factors limiting the development of infrastructure has been its dependence on public resources for investment.

**Figure 24. Trends in the Output of Infrastructure Sectors: Share (%) in GDP in Constant Prices**



Source: EPW (2002)

**Table 35. Trends in Infrastructure Development (Per '000 Population)**

	Population Million	Road Length (surfaced)Km	Power Generated Thousand KWH	Railway length	Telephones	Post Offices	Bank Branches
1950-51	359	0.44	14.21	0.15	0.47	0.10	0.01
1960-61	434	0.61	38.94	0.13	1.07	0.18	0.01
1970-71	541	0.74	103.14	0.11	2.39	0.20	0.02
1980-81	679	1.01	177.91	0.09	4.10	0.21	0.05
1990-91	839	1.22	315.02	0.07	7.18	0.18	0.07
2000-01	1,007	2.51*	496.03	0.06	32.99	0.15	0.07

\* Data available for 1998-99

Source: Government of India (2000a) and Reserve Bank of India (2001)

Commercialisation of infrastructure services has been recognised by the government, as an important pre-requisite for attracting private investment in this sector. Commercialisation requires a number of institutional changes in the reduction and provision of these services (Mohan 1996). While commercialisation has proceeded, technological changes have also provided a new impetus to the development of infrastructure, particularly in the area of communication.

**Power**

- Government has projected doubling of the existing power generation capacity by adding 100 thousand MW and substantial investment in transmission and distribution. These efforts are projected to cost Rs.8 trillion or 40 per cent of current GDP. These investments are projected over the next ten year period.
- Only 175 of hydro power potential in the country (150 thousand MW) has been tapped. X plan has allocated 60 per cent of budgetary support to hydel projects.
- A key problem in the development of power sector is the financial weakness of the state owned distribution companies. The policy reforms have aimed to address this issue through several institutional changes. One is the setting up of independent electricity regulatory commissions with powers to specify tariff structures for electricity besides arbitrating on issues between power producers, suppliers, distributors and consumers. A new Electricity Bill, 2001, is in the process of being enacted in the Parliament, which seeks to provide a legal framework for enabling reforms and restructuring of the power sector.

**Telecom**

- The tele density, number of phone lines per 100 persons of the population increased from 3.6 in March 2001 to 4.9 in December 2002. This is still well below China (13.8 in 2001) and Brazil (21.8 in 2001). The New Telecom Policy of 1999 has made the task of providing telecom services the responsibility of private companies and public sector companies rather than the government itself. The Telecom Regulatory Authority of India provides the regulatory framework for the sector.
- The total telephone connections as on March 31, 2002 were 45 million comprising of 38.2 million fixed lines and cellular connections provided by the public sector; 0.6 million fixed lines and 6.2 million cellular connections by the private sector. The total lines at the end of the year 2003 were 50 million.
- The telecom reforms have led to sharp reduction in tariffs for the consumers and improved access. Between 1999 and 2002, the tariff rates in the long distance segment came down by about 50 per cent.
- To enhance tele-density in rural and remote areas, Universal Service Obligations have been a part of the telecom policy. According to this policy, every village is expected to be provided with Public Call Office by December 2002. Out of the 607,491 villages in the country 510,773 villages were provided with public telephones by the end of December 2002.

- Telecom is a major recipient of Foreign Direct Investment (FDI). Between August 1991 and June 2002, Rs.9,528 crore FDI was received (about \$3 billion). The current expectation is that the FDI inflows would, by about \$2.5 billion per year. The 'Convergence Bill' was introduced in the Parliament in August 2001. The Bill aims at providing a regulatory and licensing authority for telecom, broadcasting and multimedia.

### **Roads**

- India has a road network of over 3.3 million kms. The network comprises of national highways, state highways, district roads, rural roads and special purpose roads (military, ports etc). The National Highways span 58,112 kms and account for 45 per cent of the total road transport demand.
- India started a major road improvement programme in the year 2000. The National Highway Development Project comprises of 5,846 kms Golden Quadrilateral connecting the four metro cities (Delhi, Mumbai, Chennai and Kolkata) and about 7,300 kms long North-South, East-West corridors. The entire project is stated to be completed by the year 2007. The estimated total cost of the project is Rs.30,300 crore (at 1999 prices) or US \$80 billion. Innovative financing mechanisms have been proposed to bring in private sector in the management of the road infrastructure.

### **Ports**

- There are 12 major and 184 minor ports along India's coast. Major ports handle about 75 per cent of the port traffic in the country. The total capacity of the major ports was 344 million tonnes as on March 31, 2002. The X Five Year Plan projects the capacity of the major ports to 470 million tonnes.
- Private sector participation in the development of ports has begun. Corporate structure for the management of ports is being considered for the future to improve the functioning of the ports.

### **Railways**

- Spread over 63,140 route kilometres, Indian Railways is one of the largest railway systems globally. About 25 per cent of the network is electrified. Indian Railways is public utility service under the Central government. A number of new initiatives have recently been taken to enlarge the role of railway transport. State governments have begun to participate in funding the expansion of railways within the respective states.

**Civil Aviation**

- Surge in trade and tourism activities in the 1990s also saw the expansion of air traffic. There are new private sector companies providing air transport services besides the public sector airlines. Private sector accounts for about 50 per cent of the domestic air traffic. Major upgradation of air port facilities has begun around the country. Private sector participation in the development of new airports has also now been an accepted policy framework.

**Urban Infrastructure**

- About 300 million of India's population live in urban areas. There are 35 cities in the country with population of more than 1 million and they account for 37 per cent of the total urban population. The issues of meeting the needs of water supply, sanitation, solid waste management, urban transport and managing congestion are a major challenge in all the urban areas. A number of references relating to land regulations, rent/tenancy regulations and related administrative mechanisms are necessary before major private investments in urban infrastructure become a reality. Mass transport systems are yet to be developed in most of the major cities. Major investments in urban infrastructure would be necessary to improve the efficiency of the urban economy and improve the quality of life for the urban population.

**Rural Infrastructure**

- The major emphasis in the government programmes in building rural infrastructure has been the development of roads, rural electrification and water supply and sanitation programmes. The X Plan aims at providing road connectivity to all rural habitations. There were 160,000 such rural areas without road-connectivity. The government policy also aims at achieving 100 per cent electrification of rural areas by 2007. At present, about 77,000 villages await electricity supply.

The importance of development of energy sector for sustaining economic development was well understood in economic policies right from the beginning of the Five Year Plans. Development of the energy sector required not only the power generation facilities but also the sources of energy or fuels. Coal has been the prime source of energy in India given its abundant supply. Thermal power plants based on coal generate about 60 per cent of total power generated in the country. The other fuels such as natural gas, LNG and diesel account for 5 per cent of total power generated. The hydropower facilities account for 35 per cent and the other sources

including nuclear facilities generate the balance of 5 per cent of power. Besides power, energy demand for transportation and other uses such as cooking has been increasingly met by petroleum products such as petrol, diesel, kerosene, liquid petroleum gas (LPG), natural gas and aviation fuel. The oil price shocks in the international markets and the volatile external security environment led India to develop its own sources of hydrocarbons. Oil and gas exploration in the off-shore and on-shore sites led to new sources of oil and natural gas. However, India is still dependent on imports for about 70 per cent of all its requirements of crude and petroleum products either for refining purposes or for direct use.

Power generation and supply are still in the public sector, although private enterprises are permitted to generate power. More reforms in the power distribution are anticipated, which, on implementation, should lead to greater efficiency in the sector and economically viable energy sector.

Realisation of limits on the existing sources of fossil fuels, primarily the hydrocarbons, has led to a search for renewable sources of energy. Often termed the 'non-conventional energy sources', solar, wind and hydro energy are now tapped wherever it is commercially feasible. In the case of hydro energy, the development of small hydro power projects or the 'mini hydro projects' has received major policy support in the 1990s.

Besides power, two other types of infrastructure essential for economic activity are transportation and communication. In both the areas, emergence of new technologies has led to reduction in the cost of these services to the consumer.

Transportation sector includes road, rail, air and sea movements of goods and people. The importance of all modes of transport for a geographically spread out country with long seashores is evident. In the 1990s, many areas of transportation sector were opened up for development by the private sector besides the continued role for the public sector. Even the development of roads, airports and seaports is now open to the private sector subject to specific procedural requirement.

Communications, particularly telecommunications have been revolutionised in the 1990s. Emergence of wireless or mobile telephones has made expansion of telecommunication faster and cheaper. In combination with the expansion of Information Technology (IT) industry and space technology, telecommunication has been able to extend its reach across the country and the quality and quantum of services have seen manifold increase in the 1990s. Again, private sector participation in telecommunication has imparted new dynamism in this segment of infrastructure.

#### 4. Globalisation and Modernisation of the Economy

Globalisation of economy was rapid in the 1990s. Trade volumes grew sharply and more distinctively, movement of international capital flows expanded. India's trade volume rose by an average of 2.7 per cent in the 1990s as compared to -3.4 per cent in the 1980s. India's economic reforms of the 1990s place Indian economy in a position to benefit from the expanding globalisation. India's share in the world increased by about 50 per cent during the 1990s, but her share in world trade is still under 1 per cent even now. As a signatory to many of the multilateral agreements on trade and investment India benefits from the rule-based trade and investment flows. India has also been upgrading the systems of financial markets and supervision to facilitate global transactions.

**Table 36. Some Measures of Modernisation of the Economies (Year 2000)**

	Population Millions	Electric Power Consump- tion Per Capita KWH	Telephone Mainlines per 1000 Population	Mobile Phones per 1000 Popula- tion	TV Sets Per 1000 Popula- tion	Personal Computers per 1000 Popula- tion	Internet Users per 1000 Popula- tion
India	1,016	379	32	4	78	4.5	4.92
China	1,262	759	112	66	293	15.9	17.83
Brazil	170	1,811	182	136	433	44.1	29.41
Sri Lanka	19	255	41	23	111	7.1	6.42
Low Income	2,460	358	23	5	91	5.1	3.80
Middle Income	2,695	1,393	139	93	275	33.1	32.40
High Income	903	8,496	604	532	641	392.7	298.81

*Note:* In the case of Electric Power data is for 1999

*Source:* World Bank (2002)

As one of the largest economies in the world, India needs to constantly improve technology and productivity not only to meet the needs of her citizens but also to play a positive role in improving the living conditions globally. For this, modernisation of her economy is a necessity. India is still behind several developing economies in modernising her economy (Table 36).

Some of the strategies needed to achieve this modernisation or higher levels of productivity are (1) opening up the economy for greater competition, technology transfers and benefit from mutual expansion of markets from the trade partners, (2) building human resources through education and training of the labour force, (3) building adequate infrastructure

for the efficient functioning of production systems, and (4) improving the systems of governance to allow growth of entrepreneurship and ensuring rule of law. The economic reforms of the 1990s have focussed on many of these elements. There is a push towards building better infrastructure, which includes financial and social infrastructure besides physical infrastructure, providing institutions to ensure enforcement of regulations, opening up of the economy both within and externally for trade and investment. India today receives about \$2 billion of FDI per year as against less than \$0.2 billion in 1990. The equity fund flows are now close to \$2 billion as against \$0.1 billion in 1990. The total foreign capital flows into India are only a fraction of such flows to China. But the continued reforms are likely to raise international capital flows to India.

The FDI flows into the country are expected to provide impetus to the exposure of domestic firms to global standards of technical, managerial and financial inputs in industry. While the flows are still small (less than 1 per cent of GDP per year), they are directed towards a variety of sectors (Figure 25).

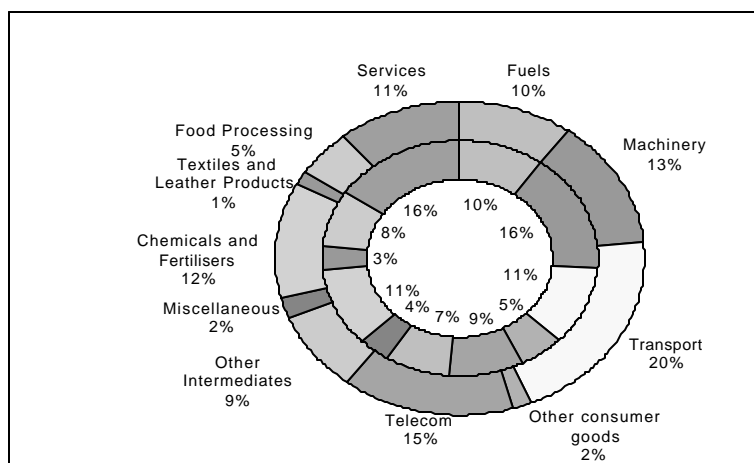
Globalisation has also been catalysed by technological innovations in information communication and processing. India has achieved some success in securing a place in the IT sector internationally, particularly in software and IT enabled services. Indian IT sector has grown from about \$5 billion in 1997-98 to \$16.5 billion of output in 2002-03. The software segment accounts for 80 per cent of the market and the export segment accounts for 80 per cent of the software market. The IT sector output is now slightly more than 3 per cent of India's GDP. Valued at \$9.9 billion in 2002-03, software and services exports account for 20 per cent of total current account receipts. The export market for IT software has moved towards greater share of 'offshore' services. Thus, developing necessary infrastructure within the country has been important for the growth of Indian IT industry. Within the export segment software market, 3.5 per cent of the revenues are from banking, financial services and insurance. In the domestic market, IT and telecom sectors account for the bulk of the IT business. Financial sector accounts for another 21 per cent of the revenues and manufacturing 15 per cent. In terms of growth, the export market has grown faster than the domestic market so far.

Technological advances in IT, telecommunication and adoption of these technologies to other areas of the economy have created entirely a new set of economic activities. The software requirements of application of IT in manufacturing, trading, finance, government administration and

business have created a new industry and India has been able to benefit from this development at the global level. The IT industry in India today is essentially the software industry and its business is in the international markets.

Application of IT in the traditional sectors has also led to the spread of IT industry in the domestic markets. Expansion of IT industry has meant a change in the structure of demand for inputs in the economy including demand for natural resources such as water and energy. Expansion of employment in the IT industry is an important avenue for the rising labour force in the economy. Combination of IT and telecommunications has led to the expansion of a variety of IT enabled services. India has begun to emerge as an important source of such services at the global level. The ‘back office’ work for businesses and the ‘front office’ work for client services are now being outsourced from developed countries to developing countries such as India. The types of services that are now being outsourced are varied and the potential for such trade in services has been estimated to be large. This rise in ‘Business Process Outsourcing’ has been a global phenomenon as ‘cheaper’ labour inputs in developing countries provide cost economies to enterprises in developed countries. However, as in merchandise trade, expansion of BPO will need to overcome domestic pressures for protection in the economies where existing business units will see competitive pressures from global service providers.

**Figure 25. Sectoral Shares of FDI (Percentage Distribution)**



*Note:* Inside ring: 1998–99; Outside ring: 1991–97

*Source:* Government of India (2001d)

There are other areas where the potential for India's exports is beginning to emerge. For instance, biotechnology is one area where India may play an important role at the global level. Behind these new promises of commercial advantages is the growth of skilled and educated labour force of the country. Modernisation of the economy requires literate, better trained, skilled and healthy labour force. India is home to one of the largest pools of scientific and technical manpower. Global markets provide an opportunity for greater economic returns to the resources. Bringing services under the multilateral trade agreement will provide greater opportunities for global trade.

## CHAPTER IV

### SUMMING UP

This review of national development policies and priorities has been carried out in the context of vast changes in the economic policy framework in the decade of the 1990s. There has been a transformation of the Indian economy from one of a relatively persistent slow paced growth in comparison to the more successful economies of East, South-east Asia and China to one of the fast growing economies in the world in the two decades of 1980s and 1990s. This change has led to renewed emphasis on achieving significant reduction in poverty and providing basic minimum services such as health and education to its citizens. Although India is still among the poor countries in the world with a per capita GDP of US \$460, its skilled labour force, strong technical capabilities and increasing openness to trade and investment have raised the potential for sustained faster economic growth. The X Five Year Plan has set a goal of 8 per cent annual growth in GDP.

The review of development policies and priorities presented in the previous three chapters identifies key areas of focus in government policies in the past development efforts while maintaining the perspective of sustainability in the development process. Both development and sustainability are multidimensional concepts. We have attempted to keep this breadth of the context in view in the discussion of development policies and strategies in India. The changing concerns of public policy are traced through their evolution in the Five Year Plans that reflect systematically the overall national goals and policies towards development.

Our attempt here has been to document the policy concerns and provide as far as possible indicators of outcome of the policies. We do not attempt to analyse effectiveness of policies or provide alternative approaches. The main points that emerge from the review presented in the previous chapters are summarised in the following paragraphs.

#### **I. Development Policy Objectives and Priorities**

In pursuit of a unity of development purpose in the context of its diverse social and cultural milieu, after independence, the nation adopted a democratic and constitutional form of government, which was also federal in nature. Planning, a participatory process with the involvement of all sections of the society, was adopted as an approach to development policy. Given the prominence given to planning in economic policy the FYPs provided the 'expression' to official policy stance of the government from time to time. We have referred to the Plan documents to trace the changing policy

concerns in the past five and half decades since India's independence. While the objectives of elimination of poverty and raising the standard of living of people remained, in all the ten FYPs formulated to-date, objectives enunciated in different plans reflected changing concerns of the times. The issue of sustainability of economic development has also been a recurrent theme in India's economic policy debates.

### **1. Standard of Living: Income, Consumption and Social Indicators**

Improved economic growth performance in the 1980s and 1990s relative to the slow pace of GDP growth until the end of the 1970s has led to greater confidence in planning for even better performance in the X FYP. The rise in GDP is also marked by rising contributions from non-agricultural sectors. The Indian economy is witnessing a swifter movement to the tertiary sector with the services registering faster rate of growth than the other sectors, particularly, in 1990s.

The level of per capita income and the average level of consumption increased over time, at swifter pace since 1980-81. Moreover, the pattern of consumption shifted in favour of non-food items over time and in favour of consumer durables within the non-food items. Again, within the food items, there is a shift from basic foods such as cereals and pulses to protective food such as fruits and vegetables, milk, meat and fish.

The other indicators of development, besides GDP and consumption, point to the significant development gaps. The rise in the proportion of population who possess basic literacy has been very slow with a significant gap between literacy rates among males and females and those in urban and rural areas. However, the 'enrolment ratios' have increased over time for children in the age group of 5-10 years where the basic primary education is imparted. Improvements in the health status in terms of lower infant mortality rates (from 115 per thousand in 1961 to 71 per thousand in 2001) and higher life expectancy at birth (from 32.1 years in 1950-51 to over 60 years in 2000-01) is noteworthy. Death rate per thousand has fallen from 27.4 in 1950-51 to over 8.5 in 2000-01, the birth rate from 39.9 to 25.8 during the same period.

Improvements in health infrastructure and manpower in government, voluntary and private sectors have been considerable. The technological advances and better access to health facilities have also contributed to improvement in the health status of the population. Nevertheless, the current level of health indicators are still extremely low, far below the levels seen in developed economies and in several of the developing economies as is evident from the low ranking of India in the Human Development Index.

## **2. Regional Dimensions of Development**

Given the large geographical size of the nation and the differences in resource endowments, the development experience of the country has varied at the regional level within the country as seen from the average levels of per capita state domestic product across states at different points of time. For example, in terms of average levels of GSDP, among the major states, Delhi had the highest per capita GSDP in 1980-81, which was 4 times the level of Bihar with the lowest per capita GSDP.

Regional variations in terms of development indicators such as education and health are also wide. Literacy rate was the highest in Kerala at 90.92 per cent in 2001 while it was lowest in Bihar at 47.53 per cent. The infant mortality rate was the lowest in Kerala at 16 per thousand live births in 2001 and the highest in Orissa at 98 per thousand. Similar differences in the case of life expectancy at birth have also been observed and Kerala has the top rank in the Human Development Index computed by the Planning Commission. These regional variations emphasise the need for local initiatives in policy and regional focus in centrally implemented policies to achieve balanced development.

## **3. Poverty Reduction, Inequality and Employment**

Reduction in poverty has been a major objective of government's economic policy. But measured in terms of the 'head count ratio' the success of policies in reducing poverty was marginal until the 1970s. However, from a level of 54.9 per cent in 1973-74 for rural and urban population combined, the incidence of poverty declined to 36 per cent in 1993-94 and an estimated 26.1 per cent in 1999-00.

While the reduction of poverty by 50 per cent of the initial ratio between 1973-74 and 1999-00 is significant, the level of incidence is still high. Using the norm of US \$1 per day, nearly 25 per cent of the world's poor are in India and 75 per cent of her poor reside in rural areas. In absolute terms there was larger number of poor people in the urban areas in 1999-00 than in 1973-74 and one of the factors swelling the ranks of urban poor is the attraction of the urban areas to rural poor as a source of employment. An analysis of the regional dimension of poverty reveals that the states with low per capita GSDP are also those where incidence of poverty is greater. The states of Uttar Pradesh, Madhya Pradesh, Orissa and Bihar where the per capita GSDP is the lowest are also the states where the incidence of poverty is the highest.

The trend in estimated measure of expenditure distribution for the various years since 1950s shows a decline in the measure of inequality

between 1953-54 and 1999-00 in both the rural and urban areas. In the last two decades of 1980s and 1990s, the rural areas show a decline in consumption inequality while in the urban areas the trend is one of increasing inequality.

Generation of employment for the growing labour force is among the main objectives of development policy. At the sectoral level agriculture has been the largest employer of labour force. However, there has been a gradual decline in the share of agriculture in total employment over the years. The projected share of agriculture in total employment is 51 per cent if the targeted growth rates in the X FYP are achieved.

There is a dichotomy between 'organised' and 'unorganised' sectors in India. Only about 8 per cent of the total workforce in the country is in 'organised sector' which has greater protection from retrenchment and access to some minimum benefits under labour laws. Public sector is a major component of the 'organised sector'. However, from a high of a 72 per cent of organised employment, the share of public sector has declined to 69 per cent in 2001.

#### **4. Sustainability of Progress**

The sustainability of economic growth and development has been constantly emphasised in the planning process. While the focus in the initial years of planning remained on issues such as raising the investment and saving rates to sustain overall economic growth, achieving regional balance in growth, the concern on the optimal use of natural resources has also been high on policy agenda.

##### **(a) Economic Vulnerabilities**

The need for higher government expenditure and the consequent resource mobilisation measures began to affect adversely from time to time the macro-economic stability as reflected in periodic high inflation rates, large current account imbalances and high levels of public debt. Financing the current account deficit through external borrowing was always a challenge for the Indian policy makers during the period when India was pursuing an import substitution policy. The rise in CAD to 3 per cent of GDP in 1991 led to a crisis and the response was a major overhaul of external trade and finance policies. There was a rapid improvement in the CAD relative to the pattern seen in the earlier episode following the crisis of the mid-1950s.

External events such as sharp oil price hikes, wars or shocks such as drought and floods also caused disruption of markets, scarcities of goods

and high inflation. The government stock of food grain has been used to supply grain at a subsidised price to the consumers increasingly by targeting the poor households for these supplies. The government stocks of foodgrain reached a record level of about 50 million tonnes during 2002, which is almost three times of the requirement of PDS.

India launched a series of wide ranging programmes of economic reforms in response to the macro-economic crisis of the 1991, of which trade liberalisation was a major part. Several restrictions on international trade were removed and foreign investment regulations were liberalised. Exports received a push with the liberalisation of foreign exchange market and a devaluation that accompanied.

The central government's fiscal position had reached an unsustainable point with much of its borrowing necessitated by debt servicing obligations. The gross fiscal deficit of the central and state governments remained close to 10 per cent even in 2002-03. The large deficits have made maintaining developmental expenditure levels more difficult. The share of non-development expenditures which include items such as interest payments on past loans has been rising and the government has responded by focusing on areas where markets are less likely to be adequate and allow market mechanisms to deliver economic growth more efficiently.

Food security, energy security, macro-economic stability are policy goals necessary for ensuring sustainability of development progress.

### **(b) Natural Resource Vulnerabilities**

In the context of the environmental concerns, the VI FYP, launched in 1980, for the first time, made environmental protection as one of the explicit objectives of the Five Year Plan. The VI FYP also proposed, "a speedy development of indigenous sources of energy, with proper emphasis on conservation and efficiency in energy use". In the VII FYP, which started in 1985, greater attention was given to policies concerning the use of natural resources and the state of the environment. The VII FYP emphasised 'optimal use' of resources rather than merely focussing on exploitation of these resources for more growth. It drew attention to the linkage between the state of environment and poverty in noting that the environment is under severe threat from the pressure generated by population growth, poverty and misuse/unplanned use of natural resources.

The IX FYP proposed social mobilisation and participation of people at all levels to ensure environmental sustainability of development process. The IX Plan laid stress on evolving methodologies for natural resource accounting to enable informed decisions on development programmes with

respect to their impact on the wealth of natural resources in the country.

***Land:***

The VIII FYP pointed to the decline in per capita availability of land. With the assumed rate of population growth it will decline to 0.3 hectares by 2007 from 0.89 hectares in 1950. For the animal population the decline is from 1.1 hectares in 1995 to 0.6 hectares by 2007.

Over the years, land resources in India have suffered from different types of degradation due to both biotic and abiotic causes. Intensive agricultural practices, which rely heavily on water, chemical fertilisers and pesticides, cause problems of water logging and salinity. Out of the total geographical area of about 328.7 million ha, almost 187.8 million ha (57 per cent) are under different types of degradation. Almost 45.3 per cent of the total degradation is due to water erosion. Due to widespread degradation vast areas are considered as wastelands.

***Water:***

The concern on the optimal use of water with respect to its conservation was less conspicuous in the initial stages of economic development planning as the emphasis was on the development of water services for accelerating agricultural growth. Although the endowment of water resources appears to be abundant there are wide variations in the availability of fresh water in India over different regions and over different periods in a year. The pressure on the available water is increasing due to the growing population. India, which has 2.45 per cent of the world's land resources, has roughly four per cent of the world's fresh water resources whereas the country's population is about 16 per cent of the world's population. In 1990, India was ranked at 42<sup>nd</sup> position among 100 countries by per capita water availability (IX Plan).

Irrigation would continue to have the highest water requirement, (about 68 per cent of total water requirement) followed by domestic water use, including drinking and bovine needs (about ten per cent of the total water requirement) in the year 2050. The projected water use per capita per year in the year 2050 would be about 725-750 m<sup>3</sup> as compared to about 650 m<sup>3</sup> at present.

The problems due to pollution arising from municipal sewage, urban and rural wastes, industrial effluents, chemical fertilisers and pesticides pose a threat to the quality of available water if not managed effectively. Lack of adequate access to safe drinking water by the population leading to health hazards is yet another challenge. The National Water Policy 1987 gave

priority to drinking water over other uses. Programmes like Accelerated Rural Water Supply Programme (ARWSP), the Pradhan Manthri Gramodaya Yojana -Rural Drinking Water (PMGY-RDW) are being implemented to provide drinking water to the rural habitations. For urban water supply, a similar programme called the Accelerated Urban Water Supply Programme was launched in 1993-94.

***Fishery Resources:***

India with a coastline of about 8,129 kms is the seventh largest marine fish producer in the world. Both marine and inland fish production increased manifold since 1950-51. The inland fish production is now as high as marine production. A large part of fish production is exported. The fishery sector has seen ups and downs in terms of production when alternative production strategies were adopted. Although technically it is difficult to establish connection between harvesting pattern and the state of the fisheries resources, there are now regulations on the harvesting of fish. The government has adopted measures to encourage inland fish production. There are regulations that seek to ensure adoption of sustainable production practices.

***Forest Resources:***

The nationally accepted stipulation of 1/3 of land area under forest cover has been difficult to attain. Although estimates vary, the current forest cover, some estimates suggest that about 23 per cent of the total geographic area of the country is under forest cover. There are indications that area under 'dense forests' with a crown density of 40% and above increased during 1997-99.

Forests are harvested for timber, industrial raw material, non-wood forest products and fuel wood. The growth of these outputs has been slower relative to the growth of the economy. The share of forestry sector in GDP has declined to less than 1 per cent as compared to 2.7 per cent in 1980-81.

The pressures on forest resources are intense. Forest land has been lost to other uses and there is also degradation of forest resource stock. The National Forest Policies of 1952, 1988 and the Forest Conservation Act of 1980 provide a number of instruments for conservation.

***Biodiversity Conservation:***

With only 2.5 per cent of the total land area of the world, the known biological diversity of India contributes 8 per cent of the global biological diversity. It is one of the 12 mega-biodiversity regions of the world. Forests,

coastline and the tropical climate favour a rich coastal and off-shore marine ecosystem. The rapid expansion of agriculture, industry, urbanisation and large scale development projects pose threats to biodiversity. India's conservation efforts include both *in situ* and *ex situ* conservation programmes. National Parks and Wildlife Sanctuaries have been established to promote *in situ* conservation, while botanical gardens and animal parks promote *ex-situ* conservation. India is a signatory to the convention on Biological Diversity 1992.

***Energy:***

The energy strategy for the country now increasingly recognises the implications of alternative energy choices on environment. Besides the economic vulnerability considerations in energy choice, environmental vulnerabilities also influence the intensity of energy use and type of fuel. The 'renewable sources of energy' received attention in the VII FYP. The concern there was on meeting the energy needs of the rural economy, to shift from forest based fuels to other commercial forms of energy. The X FYP places environmental protection among the key factors in the energy policy.

Development of the power sector has been predominantly in the public sector. Only in the recent decade, private sector participation in the generation and distribution of power has been encouraged as a policy. The need for additional financial investments and dismal performance of the power sector, in general, in meeting the needs of the economy on a sustainable basis has made private sector participation necessary. This privatisation effort has been accompanied by regulatory systems.

***Population:***

At over 1 billion, India has the second largest population in the world after China. The more recent projections show the possibility of stabilisation of population by 2020. The rise in population is a consequence of birth rates exceeding death rates. The decline in death rate has been faster with improvement in health care, increased availability of food and improving incomes. The population control programmes, on the other hand, have been gradual in their impact.

## **II. Strategies for Development**

### **1. Institutions for Development**

***Decentralisation of Governance:***

Establishment of appropriate institutional framework for implementing various development programmes has been an important

component of development policies throughout India's planning effort. The development of democratic and participatory institutional mechanisms was essential for policy implementation. The 73<sup>rd</sup> and 74<sup>th</sup> amendments to the constitution have given statutory recognition to a three-tier system of governance with Panchayati Raj Institutions (PRIs) at the District (Zilla Parishad), Intermediary (Taluk/Mandal Panchayats) and Village/Gram Sabha levels (Gram Sabha/ Panchyats) in the rural areas and Urban Local Bodies in the urban areas.

***Co-operatives:***

The impetus to decentralised governance has been based on a variety of other experiences. The co-operatives in agriculture have emerged as instruments of rural development. Its organisational structure provides for active participation of individuals at the local level. However, the success of co-operatives in a setting where literacy was low and the society was often fragmented into social classes required substantial government interventions. The co-operatives have also been important agents for change. For example, the AMUL model in which dairy farmers were organised into co-operatives to produce, process, and sell milk and milk products prompted the government to launch a programme of dairy development. The programme, 'Operation Flood', had at its core dairy co-operatives in the villages. Presently, there are large numbers of product or commodity-oriented co-operatives, such as in sugar, weaver's co-operatives, dairy co-operatives, fishery co-operatives and so on. In the mid 1990s, there were a total of 0.47 million co-operatives operating in different sectors with more than 220 million members.

***Managing Natural Resources:***

The development of institutions for involving community participation in the management of natural resources has been a challenge for programme implementation. It was realised that the centralised state control of forest resources with the objective of optimising the production of a few valuable timber species for commercial and industrial purposes was inadequate in ensuring the preservation of forest resources. Driven by the growing concerns over timber requirements and rural fuel supplies and on the basis of the recommendations of the National Commission on Agriculture 1976, the government initiated a massive social forestry programme. The strategy was to raise wood for local needs on common and private lands taking local pressures off natural forests so that they could be used for industrial purposes and environmental conservation. The social forestry programme was implemented through different plantation models like farm forestry,

community forestry, strip plantations, and rehabilitation of degraded forests and development of recreation forests. There were limitations to this approach.

The Joint Forest Management (JFM) which followed, is a concept of developing partnerships between fringe forest user groups and the forest departments on the basis of mutual trust and jointly defined roles and responsibilities with regard to forest protection and development. The Government of India issued policy guidelines for the involvement of village communities and voluntary agencies in the regeneration of degraded forest lands on 1 June 1990 under JFM programme. The policy guideline encourages non-governmental organisations, state forest departments and community groups to collaborate in managing the state forest lands. About 62,890 JFM committees covering an area of 14.25 m ha of forestland (that is, roughly about 21 per cent of the total recorded forest area) have been established.

Community participation in natural resources management was extended in the case of water resources also since it has emerged as a major challenge to public policy in the recent years. Both irrigation system and drinking water supply system were beset with several problems of management. Drawing lessons from the failure of supply-driven approaches in both irrigation and drinking water projects, the recent initiatives have been to involve the users in the management of water resources.

Although the idea of community participation in irrigation sector was not altogether new in India, the poor performance of large scale systems managed by the government agencies have led to a renewal of the importance of user participation in irrigation management. The Water Users Associations (WUAs) have emerged as central to the implementation of participatory irrigation management. The functions of WUAs include acting as an interface between farmers and the main system management of the irrigation project as well as other concerned government agencies, water distribution, operation and maintenance of the irrigation and drainage system, collection of water charges and other user charges, conflict resolution, etc. There is a great deal of variability in approaches to devolution and participation.

A beginning has also been made to involve users in both rural and urban drinking water supply projects. It is based on the expectation that implementation of a participatory demand-driven approach will ensure that the public obtains the level of service they desire and can afford to pay. The recovery of operation, maintenance and replacement costs is expected to ensure the financial viability and sustainability of the schemes.

***Poverty Alleviation:***

The poverty alleviation programmes were basically 'top to down approach' and, therefore, missed some important elements of the solution to the problem. This turned the focus on decentralisation and enhanced participation of the community at large viewed as an alternative paradigm for development strategy. Providing credit to the poor that enables them to take up economically productive activities was beset with several problems. Micro-finance programmes emerged as an effective instrument of poverty alleviation in this context. The Self-Employed Women's Association (SEWA) and other micro-finance institutions have devised innovative credit programmes to address market failure and to deliver credit to the poor. They deliver small loans to poor borrowers, often, women are organised into small groups, provide more accessible deposit facilities and with much greater attention to risk management. The process of organising women into SHGs started during the IX Five Year Plan.

**2. The Mixed Economy Approach**

The planning process provided a position of dominance to the public sector in economic development. The argument of 'social control' over production capacity was partly rooted in socialistic ideals but also partly due to the need for channelling resources for achieving plan targets. There was a need to step up investment and saving in the economy rapidly and the means to achieve this led to government interventions in mobilising resources and investment. The infrastructure sectors such as electricity generation, transport and communications were nearly the monopoly of the public sector. The role of private sector was visualised in areas where the scale of operation of a unit was small, which meant that agricultural production, trade and small enterprises continued to operate in the private sector. The private sector in industry was tightly controlled with respect to the creation of new capacities for production and was also subject to a variety of pricing controls.

A reversal of the above policies was observed during 1990s when it was felt that public sector began to be a burden on the economy's resources. Instead of contributing to the government's revenues for implementing various development programmes, the public sector began to claim resources for meeting its losses. The industrial policy of 1991 dismantled many of the controls on the private sector's expansion of capacities for production and foreign investment norms were liberalised. The private sector was also given entry into banking and finance. Now, there is an active programme of 'disinvestment' of government equity in a range of public sector enterprises.

### 3. Government Expenditure for Development

Changes in the share of different sectors in government expenditure are indicative of the changes in the priorities of government's development strategies. There has been a decline in the share of agriculture and industry in the 1990s and increase in infrastructure and services.

There was a step up in expenditures in social sectors including education and health services in the VI Plan but this was not sustained in the next FYP but subsequently there was some improvement in the level of spending on social sectors.

### 4. Regulatory Mechanisms

Constitutional provisions and legal requirements have been used to achieve various standards and norms needed for development programmes. A variety of environmental regulations have been enacted to achieve goals of environment protection and preservation. Besides, national polices in the areas of agriculture, forests, health, education, energy provide regulatory mechanism. India is also a signatory to many of the international multilateral treaties in matters relating to environment, health, investment, trade and finance.

The major legislative action in the area of environmental protection came into force with the enactment of the *Water (Prevention and Control of Pollution) Act of 1974*. Under this Act, Central and State Pollution Control Boards were established which prescribed standards for the discharge of effluent or the quality of receiving waters. Legislation relating to forests (*Forest Conservation Act 1980*), air quality [*Air (Prevention and Control of Pollution) Act 1981*] was passed. This was followed by the *comprehensive Environment Protection Act (EPA) of 1986*.

Constitutional amendments were also made to incorporate environmental concerns into development programmes. The 42<sup>nd</sup> Amendment of the Constitution in 1977 enjoined both the state and the citizen to protect and improve the environment and safeguard forests and wildlife. The 73<sup>rd</sup> Amendment in 1992 bestowed the Panchayats with the responsibilities in the area of soil conservation, watershed development, social and farm forestry, drinking water, fuel and fodder, non-conventional energy sources and maintenance of community assets.

The various national policies such as the National Forest Policy 1988, National Water Policy 1987 and 2002 are moves towards ensuring the sustainability of natural resources. India has also incorporated the spirit of Agenda 21 of the Earth Summit in Rio de Janeiro held in June 1992 in the form of two policy statements. These are the policy statements pertaining

to Abatement of Pollution and National Conservation Strategy. Schemes for Biodiversity Conservation are also initiated for ensuring proper co-ordination among various agencies concerned with the issues relating to conservation of biological diversity and to review, monitor and evolve adequate policy instruments for the same.

The various institutional approaches have been a process of learning and progress. The stimulus to new approaches has been the losses in natural resources. India loses about 5,310 million tonnes of top soil annually and that around 130 million hectares of land (45 per cent of the geographic area) is affected by serious soil erosion. A decline in the quality of forests (crown density) has been observed even though the area under forests has remained practically the same.

Similarly, there is a decline in water quality of almost all major rivers in India. The important substances which pollute water are identified as traditional organic waste, waste generated from industrial activity, chemical agents for fertilisers and pesticides for crop protection and silt from catchments. A survey of 241 Class II towns in 17 states in India undertaken by the CPCB indicates that on an average, 90 per cent of the water supplied is polluted and that only 1.6 per cent of the total polluted waste water gets treated.

The situation with respect to air pollution is no better. It has been noted that six of the largest cities in India have severe air pollution. Annual average levels of total suspended particulate matter (SPM) in these cities are at least three times the WHO standard. Industrial pollution is another major concern in India. There were 1,551 industrial units in the country falling under the 17 categories of highly polluting industries. Similarly, the share of vehicular pollution in urban areas is reaching alarming proportions. Indoor pollution is yet another area of serious concern. Women in rural households have to cope with a daily pollution load equivalent to spending 1 hour in a room that has 40 mg of SPM for every cubic metre of air as against a value of 1.2-3.0 mg recommended by WHO. These are the problems that are driving the search for new approaches and strategies.

Besides the above concerns, the municipal solid waste generated in most Indian cities is a challenge to urban planners.

### **III. Development and Sustainability Perspectives**

#### **1. Agriculture**

Agricultural development has been the focus of development policies because of its obvious role in transforming the rural areas where a majority

of India's population continues to live. Improvements in crop production initially began to focus increasingly on raising productivity per unit of land as limits of bringing more land area under crop production were quickly reached. A package of programmes to raise agricultural output based on high yielding seeds, irrigation and fertiliser was launched in the 1970s that made India self-sufficient in food production. This green revolution, along with market support by the government has ensured that the bitter experience of the famines of the 1960s was not repeated.

Indian agriculture now is more intensive in the use of inputs per hectare of land. There is greater use of water, agriculture is more mechanised than before. These aspects of agriculture have also raised the issues relating to depletion of groundwater, increasing salinity and alkalinity of land and the impact of increasing use of fertilisers and pesticides on environment. A recognition of these issues is evident in the goal of National Agricultural Policy of 2000 which seeks to achieve an output growth in excess of 4 per cent per year in a manner that is sustainable technologically, environmentally and economically.

## **2. Industry**

Industrialisation was a means to achieve economic growth and development. In the initial years after achieving political independence the planners expected industry to lead India to become a modern economy. Public sector was given the prominent role in achieving industrialisation. A major change in policies was marked with the New Industrial Policy of 1991, which heralded a new policy regime in the country that gave greater freedom of operation to the private industry. Public sector monopolies and protective trade barriers gave way to competition of the market place.

Under the new policy regime, there has been a need to re-examine India's policy of support to small scale industries through various fiscal and other incentives. The policy reforms of the 1990s exposed small scale industries to greater competition from the larger firms within the country and import competition from abroad. A strategy that is likely to succeed is the one that will help the small scale entrepreneurs to shift to those sectors where the small scale operations are more competitive and complementary to the other segments in the industry.

The government policies now require industries to adopt measures that contain pollution to safe levels. The small scale units have been provided special assistance in complying with the regulatory requirements.

### **3. Infrastructure Development**

Physical infrastructure such as roads, railway, airports, ports, power supply and communications is the lifeline of an economy. The share of energy, transport and communication in the public sector outlay has been around 25 per cent in the FYPs. The growth of infrastructure over time has been significant. However, the achievements pale in comparison to the needs of this large economy and an economy that has to grow faster to raise the levels of living for its billion plus population.

The 1990s have seen policy reforms aimed at attracting private investment to infrastructure sectors. The attempts have been more successful in the case of telecommunication and ports while in the case of power the success has not come. The reforms have established regulatory mechanisms to ensure competitive environment and consumer protection. Infrastructure development strategies have also been sensitive to the needs of sustainable development. In the case of energy and other infrastructure development, environmental impact assessment is necessary.

Physical infrastructure also includes services relating to water supply and sanitation. Public spending to provide these services remains essential. Private sector participation is likely only when user-charges adequately cover the cost of delivering the services

### **4. Globalisation and Modernisation of the Economy**

Technological innovations in production, transport and communication, financial innovations and institutional changes around the world have made global production and supply chains more efficient. National economies have come closer through trade and investment linkages. Globalisation and modernisation are interdependent in the sense that upgrading of technologies becomes necessary for participation in global transactions.

India's trade with other countries has been increasing rapidly, although not at the same pace as the growth witnessed in some of the export-oriented economies of East and South-East Asia or China. However, as a share of GDP, India's exports and imports are today nearly twice the level in 1990. Foreign investment has begun to flow both in the form of financial capital and production capital.

Information Technology has emerged as a growth industry for India. Export of computer software services is among the top forex earners for the economy. The IT enabled services are emerging as global business for India. Opening up of the economy in the 1990s by lowering the trade and investment barriers have helped Indian economy find new avenues for growth. Global markets provide an opportunity for greater economic returns

to the resources. Bringing services under multilateral trade agreement will provide greater opportunities for global trade for India.

There have been a few recurring themes in India's development policies as the objectives of development have been hard to achieve. The task of eradication of absolute poverty to meet the basic minimum needs from the country remains a task unfinished. There has always been a realisation that economic growth cannot be accomplished without at the same time attention to food security, energy security, macroeconomic stability and sustainable use of natural resources. Many economic policies that we have reviewed here show attention to sustainability of development programmes. Democratic processes, participation in global approach to development concerns and willingness to learn from the past mistakes are the features of India's policy process that are likely to help achieving sustainable development for this nation.

## NOTES

- <sup>1</sup> References to the FYPs are based on various plan documents of the Planning Commission, Government of India listed in the References section.
- <sup>2</sup> However, it is worthwhile to point out the discrepancies in the area under forest reported by different agencies. As per the reports of the Forest Survey of India (FSI) 1999, the recorded forest area of the country is 76.52 million ha. This area has been classified into Reserved, Protected and Unclassified forests, which constitute 54.44, 29.18 and 16.38 per cent of the forest area respectively. According to the FSI assessment, only 63.73 million ha is estimated to be under actual forest cover as of 1999 constituting about 19.39 per cent of the total geographical area.
- <sup>3</sup> Since 1987, the forest cover of the country is being assessed biennially by the Forest Survey of India (FSI) using remote sensing technology.
- <sup>4</sup> The National Accounts Statistics provides data on gross value added from registered and unregistered sectors of manufacturing. The unregistered sector comprises of establishments a) operating with electricity and 10 or less workers, and b) operating without electricity and 20 or less workers.

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## **About the Authors**

Dr. Shashanka Bhide is the RBI Chair Professor and Head of the RBI Endowment Unit at the Institute for Social and Economic Change. He has worked in a variety of research areas in applied economics. He has a number of publications in the area of agricultural economics and macro-economic modelling. His interests include macroeconomic modelling, agriculture and development economics. He is currently on leave from National Council of Applied Economic Research, New Delhi. He received his Ph. D from Iowa State University.

Jeena T Srinivasan has M Phil in Applied Economics from Jawaharlal Nehru University, through the Centre for Development Studies, Thiruvananthapuram. She has also submitted her Ph.D. thesis in Economics to the University of Mysore through the Institute for Social and Economic Change, Bangalore. She has participated and presented research papers in several international workshops outside India. She was also awarded Short Term Overseas Grant under the World –Bank aided India Environment Capacity Building Project (year 2001–2) and worked as guest researcher at the University of Namur, Belgium, during January to March 2002. Her areas of research interests are development economics, environmental and resource economics.