

**Development Research Group**

**Study  
6**

## **SOCIAL SECTOR EXPENDITURES AND HUMAN DEVELOPMENT**

**A STUDY OF INDIAN STATES**

**K. Seeta Prabhu  
Somnath Chatterjee**

**Issued for Discussion**

**DRG Studies Series**

Development Research Group (DRG) has been constituted in the Reserve Bank of India in its Department of Economic Analysis and Policy. Its objective is to undertake quick and effective policy-oriented research, backed by strong analytical and empirical basis on subjects of current interest. The DRG studies are the outcome of collaborative efforts between experts from outside the Reserve Bank and the pool of research talents within the Bank. These studies are released for wider circulation with a view to generating constructive discussion among the professional economists and policy makers.

Responsibility for the views expressed and for the accuracy of statements contained in the contributions rests with the author(s).

There is no objection to the material published herein being reproduced, provided an acknowledgement for the source is made.

**Director  
Development Research Group**

Requests relating to DRG studies may be addressed to :  
**Director,  
Development Research Group,  
Department of Economic Analysis and Policy,  
Reserve Bank of India,  
Post Box No.1036,  
Bombay 400 023.**

**Development Research Group**

**Study  
6**

## **SOCIAL SECTOR EXPENDITURES AND HUMAN DEVELOPMENT**

**A STUDY OF INDIAN STATES**

**K. Seeta Prabhu  
Somnath Chatterjee**

**Department of Economic Analysis and Policy  
Reserve Bank of India  
Bombay**

**May 27, 1993.**

---

Xeroxed by Photo Art Process, Wadia Building, Fort, Bombay. Tel.: 204 6751/2854268

### Acknowledgements

The authors gratefully acknowledge the support and encouragement received from Dr. A. Vasudevan and Mr. Deepak Mohanty, Officer-in-Charge and Director respectively of the Department of Economic Analysis and Policy (DEAP) of the Reserve Bank of India (RBI). Prof. M.L. Dantwala and Dr. S.L. Shetty were kind enough to go through the draft of the report and offer several useful suggestions. The authors also benefited from discussions with Dr. N.H. Antia, Dr. K.K. Balachandran, Dr. Sudha Deshpande and Dr. Romar Correa. The massive task of compiling data from various state budget documents, which were used in the analysis of state level expenditures, was ably handled by Smt. U.R. Vaidya, Smt. U.G. Udare, Smt. N.A. Bijoor, Shri V.P. Arya, Shri T.R. Vasave and Shri S.L. Narayana of the DEAP, RBI. Data on infrastructure and attainment indices were compiled and processed competently by Mrs. Suhas Karadkar and Mrs. Vasantha Venugopal of the Department of Economics, University of Bombay. Kum. D. Parajia of DEAP, RBI, provided computational support. The staff of the libraries of the Reserve Bank of India, International Institute for Population Sciences and the Foundation for Research in Community Health extended full cooperation in our endeavours to locate requisite documents. Mr. A.B. Joshirao of DEAP, RBI provided excellent secretarial assistance. Our sincere thanks to all of them.

<b>I.</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>II.</b>	<b>HUMAN DEVELOPMENT IN INDIA : AN OVERVIEW</b>	<b>5</b>
	Human Development in Indian Plans	5
	Social Sector Expenditures in India and Asia	7
	Pattern of Expenditures	10
	Rural - Urban Disparities	12
	Nutrition	13
<b>III.</b>	<b>TRENDS IN SOCIAL SECTOR EXPENDITURES</b>	<b>15</b>
	Levels of Expenditures	17
	Rates of Growth	19
<b>IV.</b>	<b>INTRA-SECTORAL ALLOCATIONS</b>	<b>23</b>
	Education	24
	Health	25
<b>V.</b>	<b>EXPENDITURE RATIOS</b>	<b>27</b>
<b>VI.</b>	<b>SOCIAL INFRASTRUCTURE, EXPENDITURES AND HUMAN DEVELOPMENT</b>	<b>30</b>
	Infrastructure Indices	31
	Attainment Indices	33
	Human Development Index	39

VII.	<b>CONCLUSIONS AND IMPLICATIONS</b>	41
	<b>NOTES</b>	57
	<b>REFERENCES</b>	59
	<b>APPENDIX I</b>	64
	<b>APPENDIX II</b>	66
	<b>APPENDIX III</b>	70

### **TABLES**

1.	Growth in Social Infrastructure 1951-1989	46
2.	Indicators of Education and Health Attainment : 1990-91	47
3.	Real Per Capita Expenditures of Major States (at 1982-83 Prices)	48
4.	Rates of Growth in Real Per Capita Expenditures	49
5A.	Intra-Sectoral Allocation - Education	50
5B.	Intra-Sectoral Allocation - Health	51
6.	Expenditure Ratios of States	52
7.	Loadings of Principal Components	53
8.	Scores of Attainment and Infrastructure Indices : 1983-86	54
9.	Scores of Attainment and Infrastructure Indices : 1988-91	55
10.	Human Development Index : Descending Order of States : (1988-91)	56

# **SOCIAL SECTOR EXPENDITURES AND HUMAN DEVELOPMENT**

## **A STUDY OF INDIAN STATES**

by K. Seeta Prabhu\*  
&  
Somnath Chatterjee\*

### **I. INTRODUCTION**

1.01 The issues pertaining to human development have been receiving increasing attention from academicians as well as policy-makers during the nineties. This is largely due to the realisation that economic growth does not automatically translate itself into better human development unless specific measures are taken in that direction (UNDP, 1991). Circumstances in several countries during the eighties have also contributed in good measure to this recognition.

1.02 A number of countries in Latin America and Sub-Saharan Africa underwent macro-economic adjustment during the eighties. An unprecedented number of countries in these regions experienced severe balance of payments crises which were sought to be overcome by resorting to loans/financial facilities from the international institutions. The package of adjustment measures associated with financial support from the International Monetary Fund and World Bank, the principal financial organisations involved in such assistance, include sharp reduction in budget/fiscal deficit, devaluation of national currency, dismantling of controls on the productive sectors of the economy and free play of market forces. In almost all countries undergoing macro-economic adjustment, the short-run consequences have been a reduction in the growth rate of GNP and a sharp increase in the debt service burden.

---

\* Dr. (Mrs.) K. Seeta Prabhu is a member of the faculty of the Department of Economics, University of Bombay. Shri Somnath Chatterjee is Research Officer, Department of Economic Analysis and Policy, Reserve Bank of India.

1.03 The impact of macro-economic adjustment on human development has been varied. While low-income countries in Sub-Saharan Africa and Latin America had to effect substantial cuts in social sector expenditures, (Stewart, 1991) the South East Asian countries like Malaysia and Indonesia could not only avert such cuts but, in fact, managed to increase their allocations for health and education (Demery and Demery, 1991). Even in countries where allocations to these sectors were cut, the poor have been protected by appropriate targeting of expenditures, a classic example of such action being Chile (Meller, 1991). The different experiences of countries seem to be due to the vastly different initial conditions, the macro-economic performance during the process of 'adjustment' and the success in formulating and implementing appropriate sector and meso policies<sup>/1</sup> so as to protect the vulnerable sections of society (Prabhu and Kamdar, 1993).

1.04 The experience of India which has embarked on a macro-economic adjustment programme since mid-1991 assumes importance in the context of the varied experience reported by countries undergoing such adjustment. India's achievement with respect to human development has been rather poor despite elements of human development being a part of India's Five Year Plans, particularly since the Fourth Plan period. In 1992, India figured among the list of countries with poor human development in the UNDP's Human Development Report, its rank being 121 among a group of 160 countries so considered (UNDP, 1992).

1.05 India's spending on concerns of human priority is reportedly only 2.5 per cent of GNP as compared to 6.3 per cent in Malaysia, 12.2 per cent in Zimbabwe, 7.7 per cent in Botswana and 5.5 per cent in Jordan (Haq, 1992). The prevalent stringent financial situation could lead to a further reduction in social sector spending if the early trends in this sphere continue. This could in turn lead to a further deterioration in the already low levels of attainment in the social sectors. Such an eventuality during the difficult period of macro-economic adjustment can be averted only by undertaking appropriate sector and meso policies.

1.06 It is against this backdrop that the present study on social sector expenditures and human development in India has been undertaken. The objectives of the study are (1) to examine the size and composition of State government expenditures on health, education and nutrition and analyse

the trends therein; and (2) to assess the impact of such expenditures on the levels of health, education and nutrition attainment.

1.07 At the outset, it needs to be reiterated that social sector expenditures are only one of the several factors determining attainment levels. Some of the other factors which have a bearing on the level of social sector development are the initial conditions reflecting the historical legacy of the region, geographical and social realities, mode of financing as well as pattern and efficiency of spending. Any relationship between social sector expenditures and human development must be viewed in the context of the complex of asymmetrically interacting forces mentioned above.

1.08 The analysis pertains to 15 major States for which data are available. The study covers the period 1974-75 to 1991-92. Further details regarding the methodology adopted in the study are given in subsequent paragraphs.

1.09 There have been several studies in the recent past on government financing of social sectors reflecting the renewed interest in the subject. Some of the important studies are those of Ravi Shankar (1988), Tulasidhar (1992) and Duggal (1992). Ravi Shankar's study covers both education and health expenditures of major states over the period 1976-77 - 1986-87. Both Tulasidhar and Duggal confine their analysis to the health sector and examine the size, composition as well as trends in health expenditures of major States. All these studies are primarily concerned with an analysis of the composition and trends in real per capita expenditures for the relevant sectors over the selected period with very little attempt made at assessing the impact of such expenditures on the levels of education and/or health attainment.

1.10 The present study addresses itself to the issue and examines both the trends in expenditure as well as its impact on human development. The study uses the concept of human development which encompasses education, health and nutrition and is thus more comprehensive in scope than the concepts used earlier. It is also a more appropriate concept to use in the context of the new economic policy. The analysis of trends in real per capita expenditure on social sectors in general, and health and education in particular, is conducted for 15 major States over the period 1974-75 to 1991-92 as well as for two sub-periods, viz., 1974-75 to 1984-85 and 1985-86 to 1991-92. The second sub-period, starting from

1985-86, marks the first year of the Seventh Five Year Plan and coincides with the beginning of a change in the country's development policy with greater emphasis being placed on liberalisation and more market-friendly approaches. An analysis of the trends in social sector expenditures during this period could offer vital insights regarding the likely trend in such expenditures in the immediate future. With the same purpose in view a detailed analysis of the intra-sectoral allocation of health and education expenditures is undertaken for 1985-86 and 1990-91.

1.11 In addition to the above analysis, the study makes an attempt, for the first time, in arriving at the social priority ratio and human expenditure ratio which are considered by the UNDP to be the most telling indicators of the Government's commitment to the cause of human development. The social priority ratio is the proportion of the States' expenditures devoted to areas of human priority. In the Indian case, these have been identified as elementary education, public health, safe drinking water, rural sanitation and family welfare (Haq, 1992). The human expenditure ratio, a summary indicator of the proportion of State domestic product devoted to aspects of human development, is obtained as a product of public expenditure, social expenditure and social priority ratios.

1.12 In order to assess the impact of these expenditures on levels of human development, indices of educational and health attainment have been constructed using appropriate indicators combined with the help of principal component analysis. These attainment indices were related to (a) the index of physical infrastructure in the respective sector which reflects the fructification of capital expenditures incurred by the States; and (b) revenue expenditure which contributes to the quality of the services rendered. This exercise has been conducted for two time-points, 1983-84 to 1985-86 and 1988-89 to 1990-91. Finally a human development index has been constructed for the 15 major States of the country for the period 1988-91.

1.13 The study is arranged into seven sections for analytical convenience. Section II that follows gives an overview of the nature of human development in the country in the context of such development in Asian countries. Section III presents a detailed analysis of the trends in social expenditures of 15 major States over the period 1974-75 to 1991-92. Section IV which follows, provides a review of intra-sectoral allocations of

education and health expenditures, at two points of time, viz. 1985-86 and 1990-91. Section V examines the expenditures in terms of human expenditure and social priority ratios. An attempt at quantifying the impact of social sector expenditures on education, health and nutrition is made in Section VI. The last Section presents the main conclusions of the study.

## II. HUMAN DEVELOPMENT IN INDIA : AN OVERVIEW

### **Human Development in Indian Plans**

2.01 Elements of human development have always been a part of Indian planning since its inception in 1951. The emphasis during the First Five Year Plan was mainly on programmes such as Community Development, Primary Education and provision of basic health facilities such as primary health centres. This thrust, however, was not maintained in the subsequent two Plans as maximisation of growth took precedence over other goals. The Fourth Plan focussed attention on the poor and asset distribution as well as employment generation programmes were implemented to improve their income levels. It was only in the Fifth Plan (1974-79) that the Minimum Needs Programme (MNP) was incorporated into the Plan Document. The main elements of the MNP were provision of universal elementary education, minimum medical facilities, safe drinking water to problem villages and several other aspects concerning housing, electricity, transport and environment. The Sixth Plan laid down minimum norms for the elements included in the MNP, besides adding Adult Education as an additional component.

2.02 In 1983, the goal of achieving Health for All by 2000 A.D. was set and the National Health Policy adopted in the Seventh Plan reiterated it. With regard to education, the main thrust of the Seventh Plan was on the implementation of the National Policy on Education (NPE) which was formulated in 1986. The National Literacy Mission was launched in 1988 in pursuance of this policy. The aim of the Mission is to impart functional literacy to 80 million illiterate people in the age group of 15-35 by the year 1995.

2.03 Social sectors have been given a great deal of importance in the Eighth Plan. In fact, the Plan document states, "Human development will

be the ultimate goal of the Eighth Plan. It is towards this that employment generation, population control, literacy, education, health, drinking water and provision of adequate food and basic infrastructure are listed as the priorities. The provision of the basic elements which help development of human capital, will remain the primary responsibility of the Government" (Planning Commission, 1992, Vol.I, Para 1.4.4).

2.04 There has been a rapid expansion of the physical infrastructure in both education as well as health sectors over the Plan period (Table 1). Correspondingly, there has been an improvement in the literacy rates as well as life expectancy. The literacy rate of persons above 7 years of age increased from 19.7 per cent in 1951 to 52.1 per cent in 1991, (Government of India, 1991 c) whereas life expectancy at birth increased from 44 years 1960 to 59.1 in 1990 (UNDP, 1992).

2.05 Despite substantial improvements, India's performance with respect to human development is considered to be low by international standards as is evident from the fact that India figures among the 64 countries with low human development in the study conducted by the UNDP in 1992 (UNDP, 1992). With regard to both education as well as health, India's achievements pale into insignificance when compared with those of other Asian countries. Sri Lanka and South Korea are often considered examples of success in pursuing appropriate mass education policies in contrast to India's attention on higher education. In 1970, Sri Lanka and South Korea recorded literacy levels of 77 and 88 per cent respectively as compared to only 34 per cent in India. The gap remained unbridged in 1990 as the adult literacy rate in Sri Lanka increased to 88 per cent and in South Korea to 96 per cent, while India's rate increased modestly to 52.1 per cent in 1991 (UNDP, 1992). India, in fact is in a paradoxical situation of having one of the largest pools of both scientific personnel as well as illiterate persons in the world. As A.K. Sen has rightly pointed out, "In this nation, with a nuclear capacity, well developed scientific knowledge and higher education ratio eight times that of China, nearly two-thirds of the citizens simply cannot read or write" (Sen, 1986, p.35).

2.06 In the case of health, India's performance is unsatisfactory when compared with that of some neighbouring countries which started their development process at the same levels of health as that of India. The examples most often cited in this regard are that of China and Sri Lanka

where the focus in the health sector has been on low cost, community based public health strategies as opposed to expensive hospital based, curative strategy adopted in India. In China, the child (under 5) mortality rate in 1960 was 203 compared to India's 282, whereas life expectancy was 47.1 years as against India's 44 years. By 1990, child mortality rate in China declined sharply to 42 while life expectancy soared to 70.1 years. In sharp contrast, India's under-five mortality rate remained nearly three and a half times higher at 142 and life expectancy was a modest 59.1 years (UNDP, 1992). In terms of health infrastructure, China and Sri Lanka were much ahead of India. In the mid-eighties, the population per hospital bed in India was 1489 as compared to only 368 in Sri Lanka and 465 in China (UNDP, 1992).

2.07 Even the modest achievements recorded in India indicate only the average position and conceal the large regional disparities within the country. Kerala, with literacy level of 90.6 per cent and infant mortality level of only 22 has a level of human development comparable to that of countries like Sri Lanka and Malaysia, which have been classified as having medium level of human development by UNDP in 1992. In sheer contrast, the infant mortality levels in Madhya Pradesh and Orissa were 116 and 122 respectively, whereas adult literacy levels were only 43.5 and 48.6 respectively (Table 2). Furthermore, considerable intra-state disparities exist in the levels of human development (Prabhu, K.S., 1992).<sup>12</sup>

### **Social Sector Expenditures in India and Asia**

2.08 China and Sri Lanka have better performance at relatively lower levels of per capita expenditures than India. This points to the fact that alongwith the levels, the pattern of spending as well as the efficiency with which resources are used are important determinants of final outcomes. The World Bank had estimated that India's expenditure on education was 3.3 per cent of GNP in 1988 which it considers to be adequate as it equals the Asian average of 3.3 per cent reported for 1985 (Tan and Mingat, 1992). While these expenditures may be considered reasonable by Asian standards, it must be noted that the Asian average is of 13 countries, 6 of which had already attained high levels of adult literacy of over 60 per cent as far back as 1960s. In sharp contrast, India's literacy levels are abysmally low even now and it is being recognised, although belatedly, that this factor constitutes a major impediment to the development process.

In this connection, it is pertinent to recall the recommendations of the Kothari Commission in the mid-Sixties. The Commission had suggested that in view of the large population and low levels of literacy in the country, a minimum of 6 per cent of GNP should be devoted to education (Education Commission, 1966).<sup>13</sup> This has been emphasised in the National Policy on Education (1986) as well as by the Ramamoorthy Committee (1991b). The Eighth Plan Document (1992) also treats this norm as its guideline. In fact, recent independent estimates reiterate that in India at least 8 per cent of GNP should be spent on the education sector if quality education is to be provided to the bulk of the population (Rao, 1992).

2.09 In the case of health, the World Bank's estimates place the expenditure (both public and private) incurred in India in 1987 at 4.3 per cent of GNP. This was higher than the regional average of 3.1 per cent as well as the figure of 4 per cent recorded by China and 2.3 per cent reported by Sri Lanka. In terms of per capita expenditure on health, in 1986-87 the estimate for India was \$ 12.5 as compared to only \$ 11 in China and \$ 9.2 in Sri Lanka (Griffin, 1992).

2.10 An important fact that needs to be noted however is that, unlike education, estimates regarding total expenditure on health in India vary considerably, since a large proportion of expenditure is incurred in the private sector for which there are very few reliable estimates. Reportedly, government expenditure on health accounts for only 1.6 per cent of GNP in India (Griffin, 1992). In most developed countries, the Government spends around 6 to 10 per cent of GDP on health care. In fact the WHO recommendation that Governments spend at least 5 per cent of GDP on the health sector in order to provide decent health care to most of the population, seems to have formed the basis for the ICSSR-ICMR suggestion that the health sector should receive 6 per cent of GNP and that the bulk of the expenditures needs to be incurred by the public sector (ICSSR-ICMR, 1981).

2.11 The World Bank estimates place the share of public expenditure in India at 37 per cent of total health expenditure in 1987 which is lower than the Asian average of 45 per cent and Sri Lanka's share of 58 per cent (Griffin, 1992). The National Council for Applied Economic Research (NCAER) survey, based on over 18,000 households in the country, estimated that in 1990, 39 per cent of the household expenditure was

incurred on government doctors and 55 per cent on private practitioners in both rural and urban areas. (NCEAR, 1992).

2.12 The Central Statistical Organisation (CSO) as well as the National Sample Survey Organisation (NSSO), in their various surveys of consumer expenditure have estimated private expenditures on health. The CSO estimates reportedly place per capita private expenditures at Rs.45.26 for 1985-86; whereas the NSSO places the figure at a higher level of Rs.56.18 for 1986-87. These figures are, however, considered to be grossly underestimated as they are not borne out by more detailed micro level studies on the subject which indicate per capita expenditures in the range of Rs.140-180 per annum.<sup>14</sup> (Duggal, 1992). The NCAER study also places average household expenditure for treatment of illnesses in 1990 at Rs.142.60 per illness episode in urban areas and Rs.151.81 per illness episode in rural areas (NCAER, 1992).

2.13 Inadequate infrastructural facilities and poor quality of services in the public sector coupled with the large investment made by the private sector in health in recent years have contributed to the rising importance of private health care services in India. The relatively large private expenditures in the context of widespread poverty is not considered a welcome development (Griffin, 1992). Since health expenditures in poorer households are in the nature of inevitable expenses incurred on disease control, they imply a poor health status of the population. What is more worrisome however, is the fact that expenditures at lower levels of income are probably diverted from essential consumption to disease control, further strengthening the nexus between poverty, under-nourishment and illness (Gill, 1987).

2.14 The role of public health care assumes added significance when it is recognised that public health facilities are largely utilised by the poorer households in an attempt to minimize the cost of health care. The NCEAR study points out that in 1990, 40 per cent of illness episodes in poorer households was attended to by government doctors whereas the proportion was only 25 per cent in the case of richer households (NCAER, 1992).

2.15 While economic status in the case of health expenditure is reflected in the type of health facilities utilised, in the education sector, it is evident in non-enrollment in school and high drop-out rates even of those enrolled.

The NSSO's 42nd Round provides some telling evidence in this regard. 51 per cent of urban children and 33 per cent of rural children in the ages of 6 to 11 years not currently enrolled, belonged to the poorest 20 per cent of households. In sharp contrast, the proportion of children not currently enrolled was only 1.3 per cent in urban areas and 5.3 per cent in rural areas for the households that constitute the top 20 per cent in terms of household incomes (NSSO, 1989). Poor economic conditions were also responsible for the high drop-out rate experienced in India. In 1987-88, the drop out rate in elementary education was reported to be as high as 62.29 per cent (CMIE, 1992, Tilak and Varghese, 1992). Over 40 per cent of the children in both rural and urban areas who had dropped-out cited economic reasons such as participation in household activity for discontinuing their studies. This is despite the fact that 90 per cent of students in primary schools in rural areas and 63 per cent of students at primary level in urban areas received free education (Minhas, 1991).

2.16 The poor quality of services provided in publicly funded schools and hospitals is considered to be an important factor explaining the poor utilisation of the infrastructure facilities provided at public cost. In the case of education, though 94.5 per cent of habitations have been provided with schools, the schools have failed to motivate the children in the relevant age group to enroll. This is due to the poor quality of services provided. An NCERT Study (1989) points out that out of 5.29 lakhs primary schools in the country, 1.44 lakhs had no pucca buildings, 2.83 lakhs had no drinking water facilities and 2628 schools had no teacher at all. Under the circumstances, it is not surprising that nearly 30 per cent of never enrolled persons in 1986-87 reported 'not interested' as a reason for their status. In the case of health, the basic rural health facilities created at the Primary Health Centres (PHC) remained largely unutilised due to their utter inadequacy in providing health care. In fact, in 1990, the PHCs accounted for only 8.2 and 5.8 per cent of all cases treated in rural and urban areas respectively (NCAER, 1992).

### **Pattern of Expenditures**

2.17 The poor levels of attainment with respect to human development in the country may be attributed, among other factors, to the distorted pattern of expenditure which favours higher level facilities located in the urban areas at the expense of primary level institutions in rural areas. With

respect to education, the World Bank's figures indicate that in 1980, only 27 per cent of public funds was allocated to primary education, as compared to the Asian average of 48 per cent in 1985. The World Bank's figures seem to relate to Plan outlays of the Central Government only. In terms of Plan outlays, the share of elementary education has been steadily declining from 56 per cent in the First Plan to 29 per cent in the Seventh Plan. However an examination of data collected from State budget documents for 15 major Indian States shows that between 34 to 64 per cent of total government education expenditure in 1985-86 was allocated to elementary education. While these expenditures are much higher than the figures given by the World Bank, they are considered by Indian experts to be inadequate. It has been suggested that around 65-70 per cent of total government expenditures should be on primary education (Rao, 1992).

2.18 A peculiar feature of the Indian education system is that even though a large part of the institutions are privately owned, their financing is from public funds. Sixty per cent of government expenses on schools is allocated as grants to privately owned institutions (Ravishankar, 1988). Recent estimates show that in 1987-88, education accounted for the highest share of 32 per cent of subsidies on social services for the 14 major Indian States considered in the study. Much less than half of this was spent on primary education (Mundle and Rao, 1991). The index of private financing on education, calculated by the World Bank for the mid-eighties also indicates the tendency of very low cost recovery in Indian education institutions, most of which are privately managed. The cost recovery in higher education in 1987-88 has been reported to be as low as 1.68 per cent for general education and only 5.73 per cent for technical education in the 14 major States considered (Mundle and Rao, 1991).

2.19 The bias towards creation of expensive hospital based facilities at secondary and tertiary levels at the expense of primary facilities has been decried by experts in the area (Antia, 1985). It has been estimated that in 1983, secondary and tertiary hospitals in India claimed 71 per cent of the total health budget of the government leaving only 29 per cent for primary health facilities. As against this, the Asian average for primary and public health facilities was 44 per cent (Griffin, 1992).

## **Rural-Urban Disparities**

2.20 The emphasis on higher level facilities which are normally located in urban areas has meant a sharp disparity between rural and urban areas with respect to human development. In the case of literacy, the urban literacy rate in 1991 at 64.9 per cent was much higher than the rural rate of 34.6 per cent (CMIE, 1992). When viewed from the point of non-enrollment, the data for 1986-87 show that 42.8 per cent of rural males and 69.2 per cent of rural females were never enrolled in any educational institution whereas corresponding figures in urban areas were much lower at 17.2 per cent and 36.3 per cent respectively (NSSO, 1989).

2.21 Health sector represents a skewed pattern even with respect to the distribution of infrastructure facilities. Nearly four fifths of the infrastructure facilities in the country are located in urban areas. The National Health Policy Document (1989) observes, "Presently, despite the constraint of resources, there is disproportionate emphasis of curative centres - dispensaries, hospitals, institutions for specialist treatment - the large majority of which are located in the urban areas of the country" (Government of India, 1989, p.40). Such a tendency in respect of health facilities, particularly hospitals to be located in the cities has been observed in several developing countries (Akin and Birdsall, 1989). The rural areas which account for 75 per cent of the country's population accounted for only 31 per cent of the hospitals, 48 per cent of dispensaries and 18 per cent of total hospital and dispensary beds. Census data show that whereas in 1961, 49.6 per cent of medical human power was located in rural areas, the proportion declined to 27.2 per cent in 1981, reflecting the failure of the medical education system to motivate the medical graduates to fulfill the needs of the rural population (Duggal, 1992). As a result of the poor development of health infrastructure, the rural population had to travel much longer distances than their urban counterparts to avail of medical facilities. Medical treatment was available within a distance of within less than 2 kms. for over 80 per cent of cases in urban areas as against 39 per cent in rural areas. In fact, in over 20 per cent of the cases, persons residing in rural areas had to travel more than 10 kms. distance to avail of medical facilities. In the circumstances, it is not surprising that the infant mortality rate in 1989 was much higher at 98 in rural areas as compared to 58 for urban areas (Government of India, 1991a).

## **Nutrition**

2.22 Nutrition, alongwith health, is considered an important end in itself and also as a means to improving labour productivity and quality of human resources in developing countries (Behrman, 1991). Nutritional status of the majority of Indian population is considered to be very low (Dandekar and Rath, 1971, Sukhatme, 1982). This is despite a dramatic increase in India's foodgrains production from 50.83 million tonnes in 1951-52 to 176.23 million tonnes in 1991-92 and the consequent increase in per capita foodgrains availability from 395 grams per capita in 1951 to 510 grams per capita in 1991.<sup>15</sup> The high and persistent levels of poverty at over 30 per cent co-existing with a 'surplus' for foodgrains is yet another paradox of the Indian development. Commenting on India's nutritional status, Amartya Sen has observed "One of the major blots is the survival of regular malnutrition - as distinct from the acute starvation and famines - in most parts of India. .... India's 'self-sufficiency' in food has to be assessed in the light of the limited purchasing power of the Indian masses. Their needs may be large but their 'entitlements' in the market are small; that the economy produces enough to meet their market demand is not in itself a gigantic achievement" (Amartya Sen, 1983 p.237). The main problem areas in nutrition have been identified as (a) inadequate household food entitlements; (b) lack of women's control over resources and (c) the malnutrition-infection complex (Gillespie and McNeill, 1992).

2.23 The nutritional deprivation in India manifests itself in the generalised form of protein-calorie malnutrition. It is concentrated among the poorer socio-economic sections of the population, particularly in the arid zones and eastern States and among children. Eightyfive per cent of the children under 5 years were estimated to have been suffering from varying degrees of malnutrition in 1981. Surveys among pre-school children from different parts of the country indicate that the diet of more than 90 per cent of the poor is deficient in calories (Gopalan, et al, 1981). Apart from general protein-calorie deficiency other deficiencies such as vitamin and micro nutrient deficiencies and iron deficiency, anaemia are widely prevalent. The expenditure on nutrition in India is negligible and constituted less than 1 per cent of GNP in 1990-91.

2.24 Some States in an attempt to improve the nutritional status, particularly of children, have focused on mid-day meal programmes, as

in Kerala and Tamil Nadu, whereas others have concentrated on indirect measures such as supply of cereals to the poorer households at highly subsidized rates. The centrally sponsored Integrated Child Development Services Scheme (ICDS) was launched in 1972. The ICDS comprises a package of six services which include health check-up, immunisation, referral services, supplementary nutrition, non-formal education and nutrition and health education. Considerable regional asymmetry has been observed in the coverage under nutrition programmes including ICDS. Four States viz., Gujarat, Maharashtra, Tamil Nadu and West Bengal, which had only 26 per cent of the poor children of the country, accounted for as much as 64 per cent of the country's children fed under various feeding programmes (Subba Rao, 1989).

2.25 Most State governments have, in general, allocated an insignificant proportion (less than 1 per cent) of their total revenue expenditures for nutrition. However, since the mid-eighties, Gujarat, Karnataka and Tamil Nadu disbursed substantially higher amounts for nutrition than the other major States. In 1991-92, the share of nutrition in total revenue expenditure was placed at nearly 2 per cent in the case of Gujarat and Karnataka and 5 per cent in the case of Tamil Nadu. The higher share of nutrition in the revenue expenditure of Tamil Nadu in particular, reflects the allocations for the mid-day meal scheme.

2.26 To sum up, the salient features of India's human development scene are as follows :

- (2) The low average level of attainment conceals the fact that there exist large inter-State and intra-State disparities and rural-urban differences in the levels of human development;
- (3) Indian expenditures in the mid-eighties were placed at 3.3 per cent of GNP for education and 4.3 per cent of GNP for health. While these levels were on par with the Asian average and hence considered adequate by the World Bank, they are lower than the norms suggested by experts in the field. In the case of education, the Kothari Commission as well as the Ramamoorthy Committee had suggested that 6 per cent of GNP be spent on education whereas the World Health Organisation and ICSSR-ICMR have recommended that government expenditure on

health should be 5-6 per cent of GNP;

- (4) The bulk of the expenditures on education and health are incurred by the State governments. In education, government's share is predominant, whereas in health private expenditures constitute nearly two-thirds of total expenditures;
- (5) The proportion of expenditures allocated to primary level facilities in both education and health are inadequate;
- (6) The access of the poor to health and education facilities is low particularly in rural areas. Low economic status accounts for a high drop-out rate in elementary education. In health, it is revealed in the greater reliance of the poor on inadequate public health services;
- (7) The quality of the services rendered in public hospitals and schools is extremely poor leading to a gross under-utilisation of existing physical infrastructure.
- (8) The nutrition sector presents a paradoxical situation of 'self-sufficiency' in foodgrains even as over 30 per cent of the poor has inadequate entitlements to food. The expenditure on nutrition was less than 1 per cent of GNP in 1990-91. There is marked regional asymmetry in the incidence of poverty as well as in the implementation of direct and indirect programmes to improve nutritional status.

### III TRENDS IN SOCIAL SECTOR EXPENDITURES

3.01 This section provides a detailed analysis of the major trends in levels of social sector expenditures particularly on education and health in 15 major States over a 17-year period ranging from 1974-75 to 1991-92 with a view to gaining a clear understanding of the emerging situation in regard to human development. Apart from total social sector expenditures, expenditures on education and health have been examined separately as they have constituted about 75 per cent of social sector expenditures in recent years.

3.02 A disquieting feature of Indian Plan expenditures on education and medical and public health has been a steady decline in the share of these sectors in total Plan outlays. In the case of education, the outlay declined from 6.9 per cent in the Third Plan period to 2.7 per cent in the Sixth Plan period. Since then it increased to 3.5 per cent in the Seventh Plan and is placed at 4.5 per cent in the Eighth Plan. In the case of medical and public health, the share declined from 2.6 per cent in the Third Plan to 1.7 per cent in the Seventh Plan and is expected to be maintained at that level during the Eighth Plan. The Eighth Plan, however, has proposed to give an added boost to the allocations for family welfare and water supply and sanitation, which would constitute 1.5 per cent and 3.8 per cent respectively of the total outlay as compared with 0.3 per cent and 1.2 per cent during the Third Plan.

3.03 The relatively low importance given to investment in social sectors is also reflected in the fact that capital expenditures constitute a very small proportion of total social sector expenditures. The share of the revenue component of social expenditure has ranged between 80 and 90 per cent for various States in 1974-75 and over 90 per cent for all States in 1991-92. Another feature of the social sector expenditures in India is that they are incurred mainly by the State governments. About 80 to 90 per cent of the public expenditure on these sectors are incurred by the States. Central financing is limited to institutions managed or regulated by the Centre or its bodies. The Central Government plays an important role in financing, policy making and planning for health services. Much of the plan allocations made by the Centre are given to the States in the form of grants for wholly or partially Centrally Sponsored Schemes. The family welfare programme, national programmes for the control of communicable diseases and the health component of the Minimum Needs Programme are centrally sponsored. In fact, over the years there has been an increase in the Centre's role in the health sector, partly due to the increasing importance of the family welfare programme. The share of Central grants in total health spending has increased from 14.2 per cent to 17.7 per cent between 1974 - 1978 and 1982 - 1986 (Tulasidhar, 1992).

3.04 An important factor underlying the differences in the levels and rates of growth of the State government expenditures is the extent of their financing by transfer of resources in the form of shared and assigned taxes, grants and loans from the Centre, which varies very significantly across

States. For example, during 1990-91 while about 70 per cent of the total expenditures of Assam was financed by Central transfers, Haryana financed less than 25 per cent of its expenditures by devolution of resources from the Centre.

### Levels of Expenditures

3.05 The analysis in this Section is conducted, in terms of State level expenditures irrespective of the source of financing of such expenditures. It is important to caution that the analysis is of total expenditures, comprising both capital and revenue expenditures. Though capital expenditures constitute nearly 30 per cent of total expenditures, they are an insignificant proportion of total education and health expenditures. In education nearly 99 per cent of total expenditures in all States are on revenue account, whereas such expenditures constitute over 80 per cent of total expenditures in the health sector. The only exception is Rajasthan in 1990-91 where the share of capital expenditures is over 30 per cent due to large-scale implementation of water supply and sanitation schemes. Definitions, concepts, sources and methodology used in this study are discussed in detail in Appendix I.

3.06 We have worked out three year averages of real per capita expenditures of 15 major States at two time points i.e. 1974-75 to 1976-77 and 1989-90 to 1991-92 (hereinafter referred to by the mid-points 1975-76 and 1990-91, respectively). These are set out in Table 3. On the basis of these data, the following points have been drawn.

- (1) In 8 out of the 15 States, real per capita total expenditures (RTE), social sector expenditures (RSE), education expenditures (REDN) and medical, public health, water supply and sanitation expenditure (RMPH) have more than doubled over the period 1975-76 to 1990-91. The States where such increases were witnessed were a mix of both high and low (per capita) income States viz., Assam, Bihar, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh. In the remaining States, the increase was between 50 per cent and 100 per cent over the period in one or more categories of expenditures.
- (2) The average levels of real per capita expenditures during 1975-

76 and 1990-91 varied significantly across States though the extent of dispersion as measured by the coefficient of variation was lower in 1990-91 particularly with respect to social sector expenditures and education expenditures; and

- (3) The REDN of all States were much higher than that of RMPH during 1975-76 and 1990-91.

3.07 An idea of the extent of dispersion in the real per capita expenditures of different States can be gauged by the fact that the highest spending State disbursed nearly one and a half times that of the All State Average (ASA) and more than double that of the lowest expending State during each of the years, 1975-76 and 1990-91. However, the gap in expenditures of the highest and the lowest spending States narrowed down over the two time points. For instance, in 1975-76, Punjab's RSE was more than three times that of Bihar's; in 1990-91, this ratio declined to about 2. These can be observed from the Table below:

#### RANKING OF STATES IN TERMS OF REAL PER CAPITA EXPENDITURES

Rank	RTE		RSE		REDN		RMPH	
	1975-76	1990-91	1975-76	1990-91	1975-76	1990-91	1975-76	1990-91
1.	Punjab (452)	Punjab (944)	Kerala (133)	Punjab (250)	Kerala (85)	Punjab (144)	Kerala (32)	Rajasthan (60)
2.	Haryana (409)	Haryana (755)	Punjab (133)	Tamil Nadu (234)	Punjab (66)	Kerala (131)	Punjab (28)	Punjab (58)
3.	Maharashtra (366)	Maharashtra (702)	Gujarat (111)	Kerala (227)	Gujarat (53)	Maharashtra (117)	Rajasthan (26)	Tamil Nadu (50)
ASA	281	578	86	187	46	99	21	42
13.	Madhya Pradesh (223)	West Bengal (431)	Madhya Pradesh (68)	Madhya Pradesh (151)	Madhya Pradesh (34)	Uttar Pradesh (75)	Orissa (16)	A.P., (34)
14.	Uttar Pradesh (206)	Uttar Pradesh (429)	Uttar Pradesh (49)	Uttar Pradesh (125)	Uttar Pradesh (31)	Bihar (72)	Uttar Pradesh (11)	Uttar Pradesh (29)
15.	Bihar (161)	Bihar (356)	Bihar (42)	Bihar (119)	Bihar (23)	Madhya Pradesh (71)	Bihar (10)	Bihar (24)

ASA : All (15) States average

Note : Figures in brackets are three year averages of real per capita expenditures in rupees.

3.08 Some of the salient features of the State-wise position of real per capita expenditures during 1975-76 and 1990-91 are as follows :

- (1) Bihar, Uttar Pradesh and Madhya Pradesh in general, occupied the last three positions in terms of the ranking of RTE, RSE, REDN and RMPH. Their rankings did not show much change over the period;
- (2) Punjab, which accounted for the highest level of RTE, also ranked among the top two States in terms of RSE, REDN and RMPH,
- (3) Kerala, ranked 5 and 7 in terms of RTE during 1975-76 and 1990-91, respectively, ranked among the top few States in terms of RSE, REDN and RMPH;
- (4) In the case of Assam, an improvement in its ranking in terms of RTE in 1990-91 was accompanied by improvements in its ranking in terms of RSE, REDN and particularly, RMPH. This is especially striking because its rate of growth of population increased, on a point-to-point basis, from 2.12 per cent (1974-75 to 1984-85) to 2.15 per cent (1985-86 to 1991-92). The high level of Central assistance provided to the State could have had a role to play in this respect. Tamil Nadu also experienced an improvement in ranking not only in terms of RTE but also in terms of RSE, REDN and RMPH;
- (5) In the case of Karnataka, despite a decline in its ranking in terms of RTE, its rank in terms of average RSE showed some improvement; and
- (6) In the case of West Bengal, the deterioration in the ranking in terms of RTE was reflected in a sizeable deterioration in terms of average RSE. Within social expenditure, while its rank in terms of average REDN was maintained at 10, that of RMPH slipped significantly from 5 to 10.

#### Rates of Growth

3.09 The trend rates of growth in real per capita expenditures for the period 1974-75 to 1991-92 are presented in the Table below.

Rate of Growth	RTE	RSE	REDN	RMPH
4 per cent or less	1. W.B. (3.7)	1. W.B.(4.0) 2. Kerala (3.8)	1. Kerala (2.9)	1. Kerala (3.6) 2. W.B. (2.9)
Between 4 and 5 per cent	1. U.P. (4.7) 2. A.P. (4.6) 3. Kar. (4.6) 4. Kerala (4.6) 5. M.P. (4.6) 6. Raj. (4.6) 8. Mah. (4.2) 9. Haryana (4.2)	1. Orissa (5.0) 2. Gujarat (4.9) 3. Punjab (4.6)	1. M.P. (5.0) 2. Orissa (4.8) 3. Punjab (4.8)	1. Punjab (4.9) 2. Kar.(4.8) 3. Orissa (4.8) 4. Gujarat (4.7) 5. Haryana (4.6) 6. A.P. (4.5) 7. Mah. (4.4)
Between 5 and 6 per cent	1. Gujarat (5.3) 2. Bihar (5.2) 3. Punjab (5.2) 4. T.N. (5.2)	1. Kar. (6.0) 2. U.P. (6.0) 3. A.P. (5.8) 4. M.P. (5.7) 5. Mah. (5.4) 6. Raj. (5.3)	1. T.N. (5.9) 2. Assam (5.8) 3. U.P. (5.7) 4. Gujarat (5.6) 5. W.B. (5.6) 6. Haryana (5.4) 7. Mah. (5.4) 8. Raj. (5.4) 9. A.P. (5.3) 10. Kar. (5.1)	1. Raj. (6.0) 2. T.N. (5.9) 3. M.P. (5.8)
Above 6 per cent	1. Assam (6.2)	1. Bihar (6.6) 2. Assam (6.5) 3. Har. (6.2) 4. T.N. (6.2)	1. Bihar (6.8)	1. Assam (7.4) 2. U.P. (7.0) 3. Bihar (6.2)

Most States experienced rates of growth of real per capita expenditures between 4 per cent and 6 per cent, while a few States like West Bengal and Kerala on one hand and Assam and Bihar, on the other, witnessed sizeable variations in the rates of growth of specific categories of expenditures.

3.10 The relatively low rate of growth of real per capita expenditures in the case of Kerala, in the context of its extremely low rate of growth of population (1.5 per cent) was on account of significantly lower rates of growth of nominal expenditures (14.8 per cent) vis-a-vis those of other States. In the case of West Bengal, however, the low rates of growth of nominal expenditures (14.6 per cent) were compounded by a relatively high rate of growth of population (2.18 per cent) resulting thereby in low rates of growth in real per capita terms. It may be mentioned, however, that the rate of growth of nominal expenditure on education in the case of West Bengal was quite high at 16.7 per cent which offset its high population growth. On the other hand, in the case of Assam and Bihar, the high rates of growth in real per capita terms were mainly on account of their sizeable growth in nominal expenditures (17.3 per cent and 16.2 per cent, respectively):

3.11 An important feature of the growth in real per capita total expenditures has been the sharp differences in the growth rates experienced between the two time periods, viz., 1974-75 to 1984-85 and 1985-86 to 1991-92 (Table 4). The growth rate in the second sub-period was considerably lower as compared to the first in all States; the deceleration was particularly sharp in Andhra Pradesh (6.2 per cent to 2.0 per cent), Haryana (6.1 per cent to 1.0 per cent), Karnataka (6.6 per cent to 1.4 per cent), Maharashtra (6.0 per cent to 1.9 per cent) and West Bengal (5.7 per cent to 1.9 per cent).

3.12 One of the reasons for the deceleration in RTE during the second sub-period was the growing financial stringency experienced by the States, particularly since 1985-86, reflected partly by the burgeoning deficit on revenue account as a result of inadequate growth in current receipts. In this context, it may be mentioned that the introduction of the Overdraft Regulation Scheme during 1985-86, designed to impart a greater degree of discipline to the financial operations of the State Governments, may have led to some slowdown in their overall expenditures. A major impact of these developments was on capital expenditures of States, which in general constitute less than 30 per cent of total expenditures. However, obligatory revenue expenditures which comprise inter alia, interest payments, pensions etc., witnessed an increase during the second sub-period in a number of States. Consequently, the attempt to keep the overall balance in check adversely affected capital expenditures.

3.13 As a result of the financial stringency experienced, the rate of growth of RSE declined sharply in all States. The deceleration was particularly high in Andhra Pradesh, Assam, Gujarat and Kerala where the growth rates experienced in the second sub-period were 1.0 per cent or even lower. In the case of Kerala however, the deceleration in social sector expenditures could also be due to the fact that the State has experienced a progressive improvement in the quality of human life obviating the need for accelerating expenditures on this score. The BIMORU States, to use a phrase coined by Ashish Bose to refer to Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, also experienced deceleration but managed to maintain growth rates in real per capita social sector expenditures in the range of 3-6 per cent during 1985-86 to 1991-92.

3.14 The deceleration in RSE had its repercussions on growth rates in REDN and RMPH, though to a much greater extent on the latter than on the former. The growth rates in REDN in the second sub-period declined in 9 out of 15 States, though the decline was sharp in only Andhra Pradesh and Assam. There was a step-up in growth rates in REDN in six States, viz., Madhya Pradesh (4.1 per cent to 6.6 per cent), Orissa (4.3 per cent to 5.8 per cent), Punjab (5.2 per cent to 7.1 per cent), Rajasthan (5.1 per cent to 7.1 per cent), Tamil Nadu (5.6 per cent to 6.1 per cent) and Uttar Pradesh (4.5 per cent to 8.3 per cent).

3.15 In sharp contrast to education expenditures, the rates of growth in real per capita health expenditures showed a massive decline in all States. Between 1974-75 and 1984-85, the growth rates in RMPH were quite high with all States registering growth of around 5 per cent or more, whereas Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, the States with high levels of infant mortality and low life expectancy, had even more impressive rates of growth of over 8 per cent. This situation changed considerably during the second sub-period with as many as six States recording negative rates of growth - these States were : Andhra Pradesh (7.2 per cent to -1.8 per cent), Gujarat (7.3 per cent to -2.4 per cent), Haryana (10.2 per cent to -2.8 per cent), Karnataka (4.4 per cent to -1.6 per cent), Madhya Pradesh (8.4 per cent to -1.7 per cent) and Maharashtra (7.5 per cent to -3.5 per cent). In four States, the rates of growth in the second time period were extremely low but positive. These States also recorded a sharp deceleration in RMPH. The States that

belonged to this category were Assam (7.6 per cent to 1.5 per cent), Rajasthan (8.9 per cent to 0.8 per cent), Uttar Pradesh (10.3 per cent to 2.4 per cent), and West Bengal (5.0 to 2.1 per cent). In Bihar, Punjab and Tamil Nadu the growth rate in RMPH in the second time period was between 2 to 4 per cent. The reduction in growth rate of health expenditure was least in Punjab (5.4 per cent to 3.3 per cent), though it still remained substantial in the other two States - Bihar (8.3 per cent to 2.5 per cent) and Tamil Nadu (9.5 per cent to 2.1 per cent).

3.16 In sum, the main features of the analysis of levels and trends in real per capita expenditures are as follows.

Between 1974-75 to 1976-77 and 1989-90 to 1991-92, the levels of RTE, RSE, REDN and RMPH increased by over 100 per cent in 8 States (including the BIMORU States) out of 15 States and between 50-100 per cent in the others. Despite such increase, Bihar, Uttar Pradesh and Madhya Pradesh continued to occupy the last three positions in respect of all categories of expenditures at both time points. Punjab and Kerala occupied the first few ranks in social sector expenditures except in RMPH in 1990-91 when Kerala moved to the fourth rank. The rates of growth in RTE witnessed a marked deceleration during 1985-86 to 1991-92 which was reflected in the sharp decline in rate of growth of RSE for all States. Among social sector expenditures, there was a reduction in REDN in 9 out of 15 States though Madhya Pradesh, Orissa and Rajasthan, States with low levels of literacy, experienced some increase in growth rates from 4 to 5 per cent in the first sub-period to 6 per cent or more in the second sub-period. All States showed a sharp deceleration in growth rates in RMPH during the second sub-period. Among the States with low health status, Madhya Pradesh registered a negative growth rate while Rajasthan had a positive but less than 1 per cent growth rate. Bihar, Orissa and Uttar Pradesh had relatively higher growth rates of 2.5 and 1.5 per cent and 2.4 per cent respectively.

#### IV. INTRA-SECTORAL ALLOCATIONS

This section presents an analysis of the intra-sectoral allocation of expenditures in education and health sectors for two time-points, i.e., 1985-86 and 1990-91 (The relevant data are presented in Tables 5A and 5B).

## **Education**

4.02 Educational expenditures in India are classified into disbursements on General Education and Technical Education. Within General Education, which accounts for over 95 per cent of the total expenditure on education in all States, allocations are made towards Elementary, Secondary, University and Higher Education, Adult Education, etc.

4.03 In the education sector, India has been classified as a country with low gross enrollment as well as low growth (Colletta and Sutton, 1989). Universal primary education has acquired the status of a social imperative (Ramirez and Boli 1982 and Bharadwaj and Balachander, 1992). Numerous studies have testified to the fact that in developing countries social returns to investment in primary education are higher than those accruing from investment at higher levels (Psacharopoulos, 1985). Social returns have also been observed to be higher for general education and women's education. A minimum level of education is considered important in improving productivity levels (*ibid*). Lockheed et al (1980) and Calcolough (1980) stress the fact that such productivity increases were more pronounced with the attainment of threshold levels of 4 to 6 years of education. Apart from purely economic reasons, investment in primary education is considered desirable from the point of view of equity and for attainment of other objectives of social policy, particularly in the fields of fertility control and improvement in health and nutrition (Cochrane, 1980, Panchamukhi, 1986). All these factors have led analysts to recommend that 65-70 per cent of government expenditures on education be spent on primary education (Rao, 1992).

4.04 The expenditures on elementary education (I-VIII standard) fell well below this norm for all States with Punjab, and West Bengal faring particularly poorly with the share of elementary education being less than 40 per cent of government educational expenditures in 1990-91. There were considerable variations across the States in the emphasis given to elementary education. The share of elementary education ranged between 35.2 per cent and 63.6 per cent in 1985-86 and between 32.9 per cent and 64.9 per cent in 1990-91. At both these time points, Punjab recorded the lowest share while surprisingly, Bihar reported the highest share. Eight out of fifteen States reported a decline in the share allotted to elementary education between 1985-86 and 1990-91. A redeeming feature however,

was that the share of elementary education increased in States with low literacy levels, viz., Bihar (63.6 to 64.9 per cent), Orissa (42.7 per cent to 55.9 per cent), Madhya Pradesh (46.8 to 60.5 per cent) and Uttar Pradesh (50.3 per cent to 58.4 per cent). Haryana and Kerala also reported an increased share for elementary education. In Maharashtra, the share of secondary education went up from 33.9 per cent in 1985-86 to 40.7 per cent in 1990-91 with a corresponding decline in the share of elementary education. Similarly, in West Bengal, the share of secondary education increased from 41.3 per cent to 47.2 per cent and that of elementary education declined from 42.3 per cent to 36.7 per cent.

4.05 The share of University (including pre-university) and Higher Education has remained fairly constant across most States. The share varied between 8.6 per cent and 20.0 per cent in 1985-86 and 7.9 per cent and 22.3 per cent in 1990-91. Andhra Pradesh reported the highest share at both time points devoting around one-fifth of total educational expenditures to higher education. Karnataka and Tamil Nadu reported a reduction with the share in the former declining from 18.4 per cent to 14.5 per cent, while in the latter it was from 16.7 per cent to 10.5 per cent. The share of adult education barely exceeded 1 per cent in most States.

### **Health**

4.06 The health expenditures in almost all the States presents a skewed pattern with medical expenditures claiming a substantial share of total funds. As may be recalled, medical expenditures represent mainly curative expenditures on hospitals and other tertiary facilities which are located mainly in urban areas. Apart from medical, the other categories of health expenditures are public health, water supply and sanitation (WSS) and family welfare.

4.07 Medical expenditures claimed between 25 and 64 per cent and between 32 and 64 per cent of the total health expenditures of the various States during 1985-86 and 1990-91, respectively. While on the one hand, Maharashtra accounted for the lowest share in medical expenditures vis-a-vis the other States during each of these years, on the other, Kerala and West Bengal accounted for the highest share during 1985-86 and 1990-91, respectively. Furthermore, in 1990-91, all States except Kerala and Tamil Nadu reported an increase in the share of medical expenditures; on an

average, the share of medical expenditures moved up from 42.6 per cent in 1985-86 to 48.4 per cent in 1990-91. The rise in the share of medical expenditures resulted in a compression in the shares of some or all the other three components of health expenditures.

4.08 Public health expenditures, on an average, constituted 12.6 per cent of total health expenditures in 1985-86; in 1990-91, the average declined to 10.6 per cent. In both the years, the share of public health expenditures varied considerably across States. In each of the years, Rajasthan reported the lowest share among all the other States (6.2 per cent in 1985-86 and 5.2 per cent in 1990-91), while Maharashtra recorded the highest (21 per cent in 1985-86 and 27.6 per cent in 1990-91). Apart from Maharashtra, the share of public health increased in Bihar (7.7 per cent to 10.4 per cent), Tamil Nadu (7.6 per cent to 10.6 per cent) and West Bengal (9.5 per cent to 11.4 per cent). On the other hand, with the increase in the medical component, the share of public health declined sharply in 11 out of 15 States; some examples are Andhra Pradesh (14.5 per cent to 10.6 per cent), Assam (13.7 per cent to 6.3 per cent), Haryana (21.1 per cent to 10.6 per cent) and Gujarat (16.3 per cent to 11.6 per cent). It is interesting to note that Kerala was the only State where the reduction in the share of public health was accompanied by a decline in the share of medical expenditures.

4.09 The share of WSS ranged between 15 per cent and 55.7 per cent in 1985-86 and between 13.9 per cent and 50.9 per cent in 1990-91. During these years, Karnataka and West Bengal recorded the lowest share while Rajasthan the highest. Four States reported an increase in the share of WSS : Assam (38.3 per cent to 47.6 per cent), Karnataka (15 per cent to 20 per cent), Kerala (17 per cent to 23.6 per cent) and Uttar Pradesh (23.1 per cent to 24.9 per cent). In 1990-91, the share of public health and WSS taken together, exceeded 50 per cent in Assam (53.9 per cent), Maharashtra (58.7 per cent) and Rajasthan (56.1 per cent).

4.10 The average share of family welfare in total health expenditures declined from 13.3 per cent in 1985-86 to 12.4 per cent in 1990-91. Only four States reported an increase in the allocations for family welfare, these were Bihar (14.5 per cent to 18.2 per cent) Kerala (11.4 per cent to 12.9 per cent), Orissa (13.8 per cent to 16.3 per cent) and Tamil Nadu (9.8 per cent to 12.0 per cent).

4.11 The main points emerging from the analysis are summed up below:

- (1) In most States, the share of primary level facilities, i.e. elementary education and public health in total government expenditures on education and health, respectively, were low, more particularly for the latter;
- (2) Seven out of 15 States spent less than 50 per cent on elementary education in 1985-86. In eight States (including four States which spent less than 50 per cent on elementary education in 1985-86, viz. Andhra Pradesh, Maharashtra, Punjab and West Bengal) share of elementary education fell further in 1990-91. The redeeming feature was an increase in the share of elementary education in States with low levels of educational attainment, viz., Madhya Pradesh, Orissa and Uttar Pradesh;
- (3) In the case of health, seven States spent over 50 per cent of funds on curative care in 1990-91 as against five in 1985-86 Only three States (Assam, Maharashtra, Rajasthan) allocated more than half the funds for public health and WSS.
- (4) The share of family welfare also declined in 11 out of 15 States.

## V. EXPENDITURE RATIOS

5.01 The UNDP's Human Development Report 1991 introduced four expenditure-ratios which were considered necessary to "analyse how public spending on human development can be designed and monitored". (UNDP, 1991). The four ratios are: (i) The Public Expenditure Ratio (PER) - the percentage of national income that goes into public expenditures; (ii) The Social Allocation Ratio (SAR) - the percentage of public expenditures earmarked for social services; (iii) The Social Priority Ratio (SPR) - the percentage of social expenditures devoted to human priority concerns, in our case (following Haq, 1992) taken to be, elementary education, preventive health care, water supply and sanitation and nutrition; (iv) The Human Expenditure Ratio (HER) - the percentage of national income devoted to human priority concerns. The HER can be expressed as the product of the other three ratios.

5.02 The four ratios have been calculated for the 15 States at four time points viz., 1974-75, 1980-81, 1985-86 and 1990-91 (Table 6). We have, of course, substituted (Net) State Domestic Products in place of national income. The HD Report provides norms for the various ratios, the fulfillment of which is expected to lead to higher levels of human development. The norms are based upon the experience of a number of developing countries with respect to human development. According to the Report, the HER may need to be around 5 per cent if a country wishes to do well in human development. This may be achieved in an efficient manner by keeping "the PER moderate (around 25 per cent), allocate much of this to the social sectors (more than 40 per cent) and focus on the social priority areas (giving them more than 50 per cent)" (UNDP, 1991, p.40).

5.03 Before proceeding further, a few comments on the expenditure ratios, in general, and the HER, in particular, may be in order. It is important to recognize that for a number of reasons, the HER per se may not provide an unambiguous insight into the existing level of human development and hence into the course of policy action that may be appropriate or required. For one, the HER is ultimately (and exclusively) a function of social priority expenditures and the (Net) State Domestic Product (SDP), as a result of which States with high domestic products (and possibly with low levels of human development) may well have low HERs. The UNDP Report suggests "What probably matters more than the HER is human development spending per person in absolute terms. This helps place the ratio in its proper perspective". Even then, however, it may be difficult to ascertain on a priori grounds whether low per capita human (or social priority) expenditure has arisen out of compulsions of financial stringency or due to the redesignation of priorities of expenditures following the attainment of a satisfactory level of human development. Furthermore, the effect of expenditures on human development may work with a lag and hence there may be little association between the two for a particular year. Finally, the expenditure ratios relate exclusively to public spending and hence they ignore the possible effects of private expenditures for human development. Consequently, it may be necessary to look at both the expenditure and attainment indicators in order to arrive at an appropriate policy decision. Towards this objective, expenditure-ratios of the 15 major States of India have been derived as a first attempt to provide an idea of the direction of public spending from the point of view of human development.

5.04 An analysis of the data in Table 6 reveals that the PER increased from an average of around 15 per cent in 1974-75 to an average of about 25 per cent in 1990-91. During 1990-91, the PER of 8 States exceeded the defined norm of 25 per cent - particularly Assam (31.66), Orissa (30.73), Kerala (29.36) and Bihar (28.53). In sharp contrast, the PER of Andhra Pradesh, Gujarat, Haryana, Maharashtra, Punjab and West Bengal fell short of the norm by around 3 to 5 percentage points.

5.05 The trends in SAR for different States show a mixed picture. While in the case of Haryana, Tamil Nadu, Uttar Pradesh and West Bengal the SAR witnessed a general improvement, Kerala, Punjab and Gujarat experienced a decline in their SAR over the years. To illustrate, the SAR for Tamil Nadu increased from 36 per cent in 1974-75 to 40 per cent in 1990-91, while that of Gujarat, declined from 34 per cent to 31 per cent, over the same period. On an average, the SAR increased marginally from 32 per cent in 1974-75 to 33 per cent in 1990-91. Only Kerala was able to maintain the norm of 40 per cent (with respect to SAR) during all the four time points, while in the case of Tamil Nadu and West Bengal, the attainment of the norm was evident only in 1990-91.

5.06 The SPR of almost all States fell well short of the norm of 50 per cent. The exceptions to this were Rajasthan, Bihar and Assam which had their SPRs above 45 per cent in most years. The SPRs of Kerala, Karnataka and Uttar Pradesh, which were relatively high (around 45 per cent or more) in 1974-75, witnessed some deterioration in the later years; however in the case of Uttar Pradesh, the SPR improved to 46 per cent in 1990-91.

5.07 For most States, the HERs have shown a rising trend from their levels of less than 2 per cent in 1974-75. In 1990-91, some States had HERs ranging between 4 and 5 per cent which was close to the defined norm. These States were: Assam (HER=4.62), Tamil Nadu (4.53), Rajasthan (4.42), and Bihar (4.38). While Kerala, Rajasthan and Assam have always figured among the first four States ranked in terms of their HER during the four time points, Tamil Nadu improved its position significantly from 5 (HER = 3.59) in 1985-86 to 2 (HER = 4.53) in 1990-91. The main reason for this improvement was the high expenditure on nutrition (or more particularly the mid-day meal scheme) which caused its SPR to rise from 38.47 per cent in 1985-86 to 42.30 per cent in 1990-91 leading to an enhanced level of HER. It is interesting to note that while Bihar had a high HER

(4.38) in 1990-91, economically better-off States like Maharashtra, Punjab and Haryana had low HERs which were placed at 2.17, 1.41 and 2.02 respectively - an observation that is not adequately explained by the level of State Domestic Product since Bihar's domestic product exceeded that of both Punjab and Haryana in 1990-91. A proper perspective is however, gained by comparing the per capita human (or social priority) expenditure which was placed lower at Rs.110.5 in Bihar than that in Punjab (Rs.119.5), Haryana (Rs.140.0) and Maharashtra (Rs.153.1). Tamil Nadu and Kerala, however, ranked high not only in terms of their HERs, but also in terms of their per capita human expenditures which were placed at Rs.202 and Rs.178.8, respectively, in 1990-91. Conversely, West Bengal and Andhra Pradesh which figured low in the ranking of HERs also had the lowest per capita human expenditures of Rs.98.2 and Rs.96.6 respectively in 1990-91.

## **VI. SOCIAL INFRASTRUCTURE, EXPENDITURES AND HUMAN DEVELOPMENT**

6.01 This Section presents the results of an exercise conducted to relate levels of social sector attainment of various States to the levels of development of physical infrastructure as well as levels and patterns of government expenditures in 1983-86 and 1988-91. It has been observed in the literature on the subject that levels of social development, particularly in the education and health sectors, are often measured using indicators that represent inputs into these sectors as well as final outcomes. For example a human development index compiled recently used life expectancy as well as infant mortality and access to drinking water as indicators (Das, 1992). While life expectancy is the final outcome, the latter two viz., infant mortality and access to drinking water, constitute determinants of life expectancy. Similarly, in education, literacy levels as well as schools per lakh population are often used in the same index (Rao, 1984). This conceptual ambiguity has been avoided in the present study and a clear distinction has been maintained between infrastructure facilities and final outcomes in each of the three sectors, viz., Education, Health and Nutrition.

6.02 As mentioned in the Introduction, the attainment levels are a function of the complex inter-action between a number of asymmetrical forces. However, given the current situation, when issues pertaining to human development are receiving increasing importance even as the

financial stringency consequent to the adoption of stabilisation and structural adjustment policies threaten to restrict the availability of funds for this purpose, it is considered useful to assess the impact that such expenditures have on levels of human development. It is to be borne in mind that, apart from levels and patterns of expenditure, the efficiency of use of resources as well as the initial levels of attainment and the policies pursued by the respective State governments over the planning period would have a critical role to play in this regard.

### Infrastructure Indices

6.03 Infrastructure development represents the fructification of capital expenditures over a number of years. The indices of such development were constructed using appropriate indicators combined with the help of principal components method.<sup>16</sup> The list of indicators used for each of the sectors is provided in Appendix II. However, a few comments in this respect are in order at this juncture. In the case of education and health, the indicators comprise number of schools, teacher-student ratio, hospitals, medical personnel and the like. The physical infrastructure in the case of nutrition was deemed to be the per capita production of foodgrains (i.e. cereals and pulses), milk and fish in the respective States along with the number of fair price shops per lakh population. The variable which affects nutritional intake more directly is per capita availability of foodgrains, milk and fish rather than the quantum of their production within the State. The use of only production data amounts to ignoring the inter-state movement of food articles across States. However, in the absence of data on net availability at the State level for the requisite time points, it was deemed appropriate to use per capita production figures instead. In fact, other researchers (Sawant, 1982, and Subbarao, 1989) had also adopted a similar procedure while analysing state level nutritional status. In order to take into account the distributional aspect, the last indicator, viz., the number of fair price shops per lakh population was included in the analysis. However, along with the existence of distributional network, the effectiveness of its functioning is critical in determining nutritional status. Data on variables measuring effectiveness were not available for the requisite time points. Nevertheless, a revised nutrition infrastructure index, incorporating indicators reflecting the effectiveness of the public distribution system, was constructed for the year 1985-86. Details regarding this index are presented in Appendix III.

6.04 The loadings of the indicators of infrastructural development on the principal components are given in Table 7. As may be observed, the first component explained over 60 per cent of the variation in the health sector at both the time points whereas this was not the case in the education and nutrition sectors. Therefore, the component scores for health were calculated using the first component only while for the education and nutrition sectors the scores were obtained as a weighted average of the scores of the first two components, the percentage of variance explained by each component being used as weights.<sup>17</sup> The scores obtained by the States in each of the sectors at both the time points are reported in Tables 8 and 9. The ranking of the States on the basis of these scores is given below :

**RANKING OF STATES ACCORDING TO  
INFRASTRUCTURE FACILITIES  
1983-86 and 1988-91**

S t a t e s	Education		Health		Nutrition	
	I	II	I	II	I	II
1. Andhra Pradesh	12	10	8	8	5	2
2. Assam	2	2	9	9	3	4
3. Bihar	4	5	14	14	7	9
4. Gujarat	13	14	4	3	15	14
5. Haryana	15	12	13	13	2	3
6. Karnataka	9	15	7	7	11	11
7. Kerala	10	9	2	1	14	15
8. Madhya Pradesh	8	8	15	15	6	7
9. Maharashtra	11	11	3	4	10	10
10. Orissa	3	3	12	12	4	5
11. Punjab	5	4	1	2	1	1
12. Rajasthan	14	13	10	11	8	8
13. Tamil Nadu	7	7	6	5	12	12
14. Uttar Pradesh	6	6	11	10	9	6
15. West Bengal	1	1	5	6	13	13

I : Denotes year 1983-86

II : Denotes year 1988-91

6.05 The ranking of the States with respect to each of the sectors differs considerably. In the education sector, West Bengal, Assam and Orissa occupied the top three positions in both the time periods. The last three ranks were obtained by Gujarat, Rajasthan and Haryana in 1983-86 and Rajasthan, Gujarat and Kerala in 1988-91. In the health sector, infrastructure development was high in Kerala and Punjab whereas Haryana, Bihar and Madhya Pradesh occupied the last three ranks uniformly at both the time points. In nutritional infrastructure, predictably, Punjab and Haryana occupied the top two positions whereas Kerala, Gujarat and West Bengal occupied the last three positions at both the time points.

### **Attainment Indices**

6.06 Indices of sectoral attainment reflecting final outcomes in each sector were constructed for the 15 States for the two time points. For education, the indicators selected were adult literacy, female literacy and average years of schooling which were combined using the principal components method. The indicator, average years of schooling, traces the number of years spent in school by a cohort and is obtained using primary and secondary school enrollment ratios weighted by the number of years spent by the cohort at each stage of schooling. Since the calculation considers enrollment at various stages in the education cycle, the drop-out rate is implicitly taken into account in the procedure. Further details regarding the methodology adopted are given in Appendix II.

6.07 The attainment levels in health and nutrition are reflected clearly in life expectancy as pointed out by various studies on the subject. Since our interest was in identifying the components that constitute attainment we tried to approximate the determinants of life expectancy. Two main indices, one representing health status and another representing nutritional status were thus constructed. Health status was represented by a mortality index. The mortality index comprises two indicators viz., infant mortality rate and crude death rate. Maternal mortality rate is also considered to be an important determinant of mortality status, particularly in India. However since data on this aspect were not available Statewise, this indicator, though important, had to be omitted from the analysis. In order to obtain a nutrition index, it is necessary to use indicators such as per capita calorie and protein intake. Such data were not available at the State level for the requisite time points. Therefore, the per capita expenditure

data collected in the various NSS rounds were used instead. Calorie intake was approximated by using per capita consumption expenditure on cereals whereas protein intake was represented by per capita consumption expenditure on pulses, milk and milk-products, meat, fish and eggs for the requisite time points. Ideally, given the synergistic relationship between malnutrition and disease, the index should have included a negative indicator representing the incidence of infectious diseases. Once again the paucity of reliable data on this aspect restricted our attempt in this direction. Thus, the mortality index was constructed using infant mortality rate and crude death rate as indicators whereas the nutrition index comprised average per capita consumption expenditure on cereals and average per capita consumption expenditure on pulses, milk and milk products, meat, fish and eggs. These two indices were obtained by taking the average of indicator values made scale free by dividing them by respective means. Estimates show that the mortality and nutrition indices explained over 92 per cent of the variation in life expectancy in the mid-eighties.<sup>18</sup> The scores obtained for the education, health and nutrition attainment indices by various States at each of the time points are given in Tables 8 & 9. Since mortality is a negative dimension of health status, the ranking of States was done inversely with the State obtaining the maximum scores being given the least rank and vice-versa. The ranking of the States with respect to education, health and nutrition attainment is given below.

**RANKING OF STATES ACCORDING TO  
ATTAINMENT LEVELS  
1983-86 and 1988-91**

States	Education		Health		Nutrition	
	I	II	I	II	I	II
1. Andhra Pradesh	11	11	8	8	12	10
2. Assam	14	9	10	10	4	4
3. Bihar	6	14	12	11	8	7
4. Gujarat	9	4	9	9	6	15
5. Haryana	5	8	7	7	1	1
6. Karnataka	8	7	4	6	10	14

	I	II	I	II	I	II
7. Kerala	1	1	1	1	5	6
8. Madhya Pradesh	12	12	13	15	14	12
9. Maharashtra	2	3	3	3	15	13
10. Orissa	10	10	14	14	11	11
11. Punjab	4	5	2	2	2	2
12. Rajasthan	15	15	11	12	3	3
13. Tamil Nadu	3	2	6	5	13	9
14. Uttar Pradesh	13	13	15	13	9	8
15. West Bengal	7	6	5	4	7	5

I : Denotes year 1983-86

II : Denotes year 1988-91

One major factor that emerges on a perusal of the Table is the distinctly different ranking of the States that emerges in education and health sectors on the one hand and nutrition on the other. Haryana and Punjab were the top two States with respect to nutrition. While Haryana's position was at the middle level with respect to education and health, Punjab's health attainment was second only to that of Kerala though it lagged behind in the education sector. The States which obtained the first three ranks with respect to the education sector were Kerala, Maharashtra and Tamil Nadu in both the time periods, whereas in health, it was Kerala, Punjab and Maharashtra in that order. The States with low attainment levels in education at both the time points were Madhya Pradesh, Rajasthan and Uttar Pradesh. Assam improved its position in educational attainment dramatically from 14 to 9 over the two time points, whereas Bihar's position slipped equally glaringly from 6 to 14. Bihar's relative deterioration despite a high rate of growth in REDN during 1985-86 to 1991-92 is rather surprising and merits further separate examination. There were no such sharp changes in the rankings in the health sector. With respect to nutrition, Haryana, Punjab and Rajasthan uniformly occupied the top three positions in both the time periods. Gujarat, Karnataka and Maharashtra had ranks at the lower end in 1990-91 whereas in 1985-86, Maharashtra, Madhya Pradesh and Tamil Nadu occupied the last three ranks.

6.08 It is interesting to compare the attainment levels with ranking of States with respect to real per capita expenditures incurred on these sectors. The Table below sets out the ranks of the various States with respect to average real per capita expenditures on education and health for the two time-points being considered.

**Ranking of States According to Real  
Per Capita Expenditures\* 1985-86 and 1990-91**

S t a t e s	REDN		RMPH	
	1985-86	1990-91	1985-86	1990-91
1. Andhra Pradesh	10	11	10	13
2. Assam	4	7	8	6
3. Bihar	14	14	15	15
4. Gujarat	3	4	7	8
5. Haryana	6	6	2	7
6. Karnataka	8	9	9	9
7. Kerala	1	2	6	4
8. Madhya Pradesh	13	15	11	11
9. Maharashtra	5	3	3	5
10. Orissa	12	12	13	12
11. Punjab	2	1	4	2
12. Rajasthan	11	8	1	1
13. Tamil Nadu	7	5	5	3
14. Uttar Pradesh	15	13	14	14
15. West Bengal	9	10	12	10

\* The expenditures relate to three-year averages centred on the years shown.

6.09 It is evident that generally States with low attainment levels were also the ones with low per capita expenditure. Rajasthan and to some

extent Kerala, were exceptions in this regard. In the case of Rajasthan, a State with low health status, the high per capita expenditure in the health sector was due to the high expenditures on water supply and sanitation in recent years. The ranking of Kerala with respect to per capita health expenditures was six in 1983-86 and four in 1988-91. Despite this low rank in expenditures it maintained its position in health attainment level at the top. This indicates the efficiency with which expenditures were incurred in the State. The emphasis on low cost strategies adopted in the State may also have been a relevant explanatory factor in this regard.

6.10 An examination of the ranking of States with respect to attainment levels and infrastructure development however do not reveal a similar neat relationship. The States with low attainment levels, viz., Bihar, Madhya Pradesh and Uttar Pradesh do not seem to fare poorly with respect to infrastructure development. Kerala, on the other hand, despite a relatively low rank with respect to infrastructure development had high levels of attainment in education and health sectors.

6.11 These findings strengthen our conviction that the mere existence of physical infrastructure is by no means an indication of the extent and efficiency of its utilisation. In fact, one of the major characteristics of the human development scene in India is its emphasis on the achievement of physical targets with relatively little attention being paid to the quality of services rendered therein. The comments made earlier in Section II are relevant in this regard.

6.12 In order to understand further the relationship between attainment levels, infrastructure development and expenditures, regression analysis was conducted. The component scores obtained by the various States in attainment indices were related to the scores in infrastructure development and real *per capita* revenue expenditures. The results of this exercise arrived at for 15 major States in 1985-86 as well as 1990-91 are reported in the Table below.

Year	Equation				$R^2$	
1985-86	EDCNL ATTN =	0.934 - 0.049 (1.058) (-0.107)	INFRA ED +	0.025** (2.936)	REV ED	0.334
1990-91	EDCNL ATTN =	0.002 + 0.152 (0.003) (0.604)	INFRA ED +	0.024* (4.613)	REV ED	0.579
1985-86	HEALTH ATTN =	2.923* - 0.062** (6.483) (-2.469)	INFRA HET -	0.016 (-1.118)	REV HET	0.385
1990-91	HEALTH ATTN =	2.690* - 0.072* (6.630) (-3.347)	INFRA HET -	0.006 (-0.527)	REV HET	0.593
1985-86	NUTN ATTN =	1.788* + 0.237* (18.053) (3.967)	INFRA NUTN -	0.001 (-0.074)	REV NUT	0.512
1990-91	NUTN ATTN =	1.966* + 0.168** (13.551) (2.288)	INFRA NUTN -	0.030 (-1.248)	REV NUT	0.324

Figures in parenthesis are t-values

\* Significant at 1 per cent

\*\* Significant at 5 per cent

6.13 As may be seen from the Table, contrasting results are obtained for health and educational attainment. While in the case of health, the coefficient of infrastructure development is statistically significant and that of *per capita* revenue expenditures is statistically insignificant, the converse is true for educational attainment. That education infrastructure has virtually no impact on educational attainment does seem surprising, and merits separate in-depth analysis. The probable reasons for this could range from gross inefficiency in the use of resources, and the poor quality of services rendered in the existing infrastructure to the importance of non-formal methods in influencing literacy levels. Earlier studies on the subject (Ravi Shankar, 1988) do point to substantial 'leakages' in the Sector.<sup>12</sup> On the other hand, the significant relationship between health attainment and infrastructure gives further credence to the urgent need for stepping up

infrastructure development in order to improve health levels. (Since health attainment is measured by mortality, a negative relationship with health infrastructure is to be expected).

6.14 Nutritional attainment is also explained significantly by infrastructure development. That the coefficient of real *per capita* revenue expenditures is statistically insignificant seems obvious given the extremely low levels of expenditures of most States for this purpose.

### **Human Development Index**

6.15 Finally, a human development index has been constructed for the 15 major Indian States for 1990-91 using the UNDP methodology. The three indicators used for the purpose were : log of *per capita* SDP adjusted for income distribution,<sup>10</sup> component scores obtained in the education index and an average of the component scores obtained in health and nutrition. A combined index of health and nutrition was considered necessary for two reasons. Firstly, our interest in these indices was on account of their being the main determinants of life expectancy. Two separate indices were built up initially to approximate life expectancy. It therefore seemed logical to combine them at a later stage by giving equal weights. Furthermore, income, education and health are the three main components of the UNDP index in which all the three indicators are given equal weights. Since we followed the UNDP methodology for constructing the human development index, retaining separate indices for health and nutrition would have meant assigning a greater weight to life expectancy implicitly.

6.16 The scores obtained by various States in the Human Development Index (HDI) are given in Table 10. The ranking of the States with respect to the HDI as well as *per capita* SDP (PCSDP) are given below.

**Ranking of States According to  
Human Development : 1988-91**

Name of the State	Ranking of States with respect to	
	HDI	PCSDP
Kerala	1	9
Punjab	2	1
Haryana	3	3
Maharashtra	4	2
West Bengal	5	6
Tamil Nadu	6	8
Gujarat	7	4
Karnataka	8	5
Assam	9	13
Andhra Pradesh	10	7
Rajasthan	11	10
Orissa	12	14
Uttar Pradesh	13	12
Bihar	14	15
Madhya Pradesh	15	11

Punjab has a high rank with respect to HDI as well as *per capita* SDP. In fact, if the indicator used in calculating the HDI is *per capita* SDP instead of log of per capita SDP, then Punjab ranks first and Kerala second. The use of logs reduces the importance of the income variable at higher levels of income and thus relegates Punjab to the second position.

6.17 Kerala's position as the top ranking State in human development is jeopardised by its poor performance on the economic front. In contrast, Punjab's performance with respect to SDP growth has been creditable and it also ranked among the top two States as far as real *per capita* expenditures (RTE, RSE, REDN and RMPH) are concerned. However, its human expenditure ratio (HER) as well as SAR and SPR continue to be low. A shift in expenditures to social sectors from higher level facilities to primary level would certainly help Punjab emerge as the top ranking State in human development as well.

6.18 The BIMORU States of Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh continue to figure among the lowest ranking States with respect to both SDP as well as human development. Despite efforts since 1985-86 to increase levels of expenditure on education and health, these States continue to figure among the States with the lowest REDN and RMPH.

## VII. CONCLUSIONS AND IMPLICATIONS

7.01 Some interesting conclusions emerge from our analysis. They also point to some useful implications for policy. These are brought together here in the form of points.

- (i) Although the actual allocations to the education and health sectors are at par with the average levels in Asian countries and are considered adequate by some studies at the World Bank, it is necessary to substantially raise the allocations to social sectors. This is considered imperative in view of the low average level of human development in the country. In the case of education, the Kothari Commission's recommendation in 1966 of the importance of allocating at least 6 per cent of GNP to the education sector has been accepted and incorporated in the New Policy on Education in 1986 and further reiterated by the Ramamoorthy Committee in 1991 as well as the Eighth Plan Document in 1992. The New Policy resolution that from the Eighth Plan onwards the outlay on education should uniformly exceed 6 per cent of GNP needs to be operationalised expeditiously. Education is in the concurrent list though the bulk of the expenditures are incurred by the State governments. It is necessary that the Centre also plays an active role in devising and implementing strategies for greater advancement in this vital sector. In the case of health, public expenditure constitutes only around 40 per cent of the total expenditures on the sector. The high level of private expenditures in the context of low incomes and widespread poverty indicates that expenditures are diverted from essential consumption to unavoidable curative medical care. Furthermore, the resurgence of several debilitating diseases and the need to undertake preventive measures also makes it necessary to

enhance allocations to this sector. The World Health Organisation's recommendation that governments should spend atleast 5 per cent of national income on health as well as the ICSSR-ICMR recommendation that India should spend 6 per cent of GNP on health assume significance in this regard.

The expenditures on nutrition constitute less than 1 per cent of GNP and are incurred on certain schemes in a few States. There is an urgent need to increase the range and scope of nutrition interventions both directly as well as through indirect measures.

In the case of States like Maharashtra, it is necessary to increase the overall levels of public expenditure whereas in others, *viz.*, Bihar, Orissa and Uttar Pradesh among low income States and Karnataka, Punjab and Haryana among medium and high income States, where the social allocation ratios are well below the 40 per cent norm prescribed by the UNDP, it is necessary to substantially raise the allocations to social sectors.

- (ii) It is necessary to stress that given the synergistic relationship between education, health and nutrition, it is imperative that the allocations to these sectors be raised simultaneously. The tendency noticed since mid-eighties in several States of accelerating expenditures in the education sector at the expense of sharp deceleration in health expenditures is bound to be self-defeating in nature.
- (iii) The increase in allocations has to be accompanied by a drastic reallocation of resources in favour of primary level facilities, particularly in the health sector. At present over 50 per cent of allocations in the education sector are towards elementary education. This needs to be raised to over 65-70 per cent in all States. In the health sector, currently less than 20 per cent of government health expenditures are incurred towards public health. Even if water supply and sanitation were to be taken into account, the expenditures do not, on an average, exceed 40 per cent of total health expenditures. This needs to be rectified and a substantial proportion of total health expenditures should

be on public health. This would involve a reorganisation of the health infrastructure to suit the requirements of the bulk of the population in rural areas. The Bhore Committee's recommendations with respect to the provision of decentralised and integrated provision of curative, preventive and promotive services in rural areas merits serious attention by the policy makers.

- (iv) The need to improve the overall efficiency of expenditures cannot be overemphasised. The enhanced and retargetted expenditures need to be spent with a view to substantially improving the quality of services provided in public sector schools and hospitals. The present phenomenon of low quality services leading to non-utilisation of the services provided in primary health centres as well as the lack of interest in schooling and high drop-out ratios of those enrolled need to be checked at all costs. Improvements in efficiency are particularly required in States which have witnessed high rates of growth in expenditures with no corresponding improvement in levels of attainment. The adoption of suitable mass based low cost strategies with active public participation as in the case of current literacy campaigns need to be encouraged substantially. The support of non-governmental organisations (NGO's) may be enlisted to ensure effective monitoring of social sector schemes.
- (v) Another important factor that is not adequately recognized is that development of human resources is a long and arduous task and the resultant benefits would be forthcoming only after a considerable time lag. Substantial efforts in this direction over a long period of time are thus essential for obtaining tangible results. For, even as many speak in glowing terms about Kerala's success in educational attainment, it is not adequately recognised that efforts in this direction were initiated as far back as early 1880s. The current tendency of initiating several new schemes during the Plan period but allowing them to languish for want of funds once the Plan assistance ceases must be avoided. Also there is a need for adequate follow-up and continuous monitoring of schemes initiated in the social sectors.

In the current context of the ongoing macro economic adjustment, care needs to be taken to see that short-run exigencies do not undermine the importance of long-term goal of sustained improvement in the level of human development. Specific sector and meso policies to protect the vulnerable sections need to be undertaken expeditiously.

- (vi) It is important to remember that the difficult task of improving the quality of human resources cannot be achieved without the active involvement of both the Central and State governments. As of now, 80 to 90 per cent of expenditures on education and health is incurred by the State governments and the Centre's role is confined mainly to formulating policies and providing leadership and guidance to the State governments. Education is a subject on the concurrent list as per the Constitutional Amendment of 1976, while health is a State subject. Paradoxically, the Centre's involvement in health has been growing and it finances upto 20 per cent of the total health expenditures incurred whereas in education its involvement is considered generally inadequate. The strategies of human development adopted in the States as reflected in the levels and patterns of expenditures incurred are quite varied. The level of Central financing of State expenditures also differs across the States, with Central financing not always matched to needs of these sectors. The need for increasing allocations to human development has been recognised by the Planning Commission and the Central Government. This is reflected in the fact that human development has been made the focus of attention in the Eighth Plan and increased allocations for education and health sectors have been proposed in the Union Budget for 1993-94. While this is welcome, in view of the fact that the bulk of the expenditures on education and health are incurred by the State governments, their budgetary position is critical in influencing human development. The financial stringency experienced since mid-eighties has led to a deceleration in the growth rate of social sector expenditures, particularly in the health sector. Efforts may have to be directed towards enhancing the resources of the States with low attainment levels. Given the fact that both the Central and State Governments are likely to experience

financial constraints for the next few years, there is an urgent need to explore the possibilities of procuring resources from both international agencies as well as the corporate sector in the country through innovative schemes. Concessional financing through International Development Association (IDA) type facilities for financing specific social sector projects may need to be negotiated. On the domestic front, the scope of fiscal incentives such as tax reliefs may be expanded to induce the corporate sector to participate more actively in financing social sector projects.

7.2 Finally, success of human development strategies in the country depends on the initiative, direction and thrust that the Central and State Governments provide, particularly in Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, States with large population and low levels of human development. An enhanced allocation with focus on primary level facilities and sustained effort at the level of the States are the main ingredients of success in the human development sphere.

**Table 1**  
**Growth in Social Infrastructure 1951 - 1989**

	1950-51	1988-89
<b>Education Infrastructure</b>		
1) Primary/Junior basic schools ('000)	210	548
2) Middle/Senior basic schools ('000)	14	144
3) High/Higher secondary schools ('000)	7	73
4) Colleges for general education (degree and above)	542	4718
5) Universities	27	181
6) Teachers in primary schools ('000)	742*	1603
7) Teachers in middle schools ('000)	345*	1033
8) Teachers in higher secondary schools ('000)	296*	1236
<b>Health Infrastructure</b>		
1) Number of Hospitals	2717	10172
2) Number of Dispensaries	6891	28304
3) Number of Primary Health Centres (a)	2800*	20531
4) Number of Hospital Beds per lakh population (b)31		78(c)
5) Number of Registered Doctors per lakh population	16.5	48.2**

\* Figures relate to the year 1960-61

\*\* Figure relates to the year 1987

a) Relates to financial year

b) Includes all types of beds in hospitals, dispensaries,  
PHCs, and voluntary organisations.

c) Includes beds in hospitals and dispensaries only.

Source : CMIE : *Basic Statistics Relating to the Indian Economy*,  
Vol.I, All India, August 1992.

**Table 2**  
**Indicators of Education and Health Attainment : 1990-91**

S t a t e	Life Expectancy Combined (1981-86)	Adult Literacy (%) (1991)	Female Literacy (%) (1991)	Infant Mortality (3 yrs.avg.) (1988-90)	Death Rate (3 yrs.avg.) (1988-90)
Andhra	58.0	45.1	33.7	78	9.4
Assam	52.4	53.4	43.7	89	11.1
Bihar	54.1	38.5	23.1	88	11.8
Gujarat	56.8	60.9	48.5	83	9.8
Haryana	60.6	55.3	40.9	80	8.9
Karnataka	60.6	56.0	44.3	75	8.6
Kerala	67.6	90.6	86.9	22	6.1
Madhya Pradesh	52.4	43.5	28.4	116	13.2
Maharashtra	60.2	63.1	50.5	62	8.0
Orissa	53.0	48.6	34.4	122	12.2
Punjab	64.3	57.1	49.7	61	8.1
Rajasthan	55.1	38.8	20.8	94	11.1
Tamil Nadu	58.1	63.7	52.3	70	8.9
Uttar Pradesh	49.1	41.7	26.0	113	10.5
West Bengal	56.6	57.7	47.2	70	8.4

Source : CMIE : *Basic Statistics Relating to the Indian Economy*, Vol.II, States, September 1992.

**TABLE 3**  
**REAL PER CAPITA EXPENDITURES OF**  
**MAJOR STATES (AT 1982-83 PRICES)\***

STATES	RTE		RSE		REDN		RMPH		(Rupees)
	1975-76	1990-91	1975-76	1990-91	1975-76	1990-91	1975-76	1990-91	
Andhra Pradesh	247.90 (9)	505.74 (10)	73.67 (11)	175.94 (10)	37.70 (12)	82.71 (11)	18.41 (10)	33.68 (13)	
Assam	229.43 (12)	609.86 (5)	73.89 (10)	184.53 (8)	43.88 (8)	106.46 (7)	17.59 (11)	45.96 (6)	
Bihar	161.30 (15)	356.08 (15)	41.99 (15)	119.02 (15)	23.41 (15)	72.20 (14)	9.79 (15)	24.34 (15)	
Gujarat	320.94 (4)	699.89 (4)	110.71 (3)	215.23 (6)	52.96 (3)	113.89 (4)	22.19 (8)	42.53 (8)	
Haryana	409.00 (2)	755.38 (2)	90.79 (6)	218.23 (4)	49.89 (5)	106.56 (6)	22.74 (7)	43.49 (7)	
Karnataka	293.56 (6)	576.85 (8)	82.20 (9)	188.33 (7)	44.74 (7)	94.12 (9)	20.83 (9)	37.27 (9)	
Kerala	305.93 (5)	594.39 (7)	132.71 (1)	227.23 (3)	85.11 (1)	131.27 (2)	31.55 (1)	49.08 (4)	
Madhya Pradesh	222.74 (13)	447.71 (12)	68.09 (13)	151.37 (13)	33.69 (13)	70.95 (15)	16.81 (12)	34.61 (11)	
Maharashtra	365.64 (3)	702.09 (3)	98.42 (4)	216.62 (5)	51.71 (4)	117.08 (3)	25.31 (4)	45.37 (5)	
Orissa	242.82 (10)	489.54 (11)	73.08 (12)	156.55 (12)	37.73 (11)	78.86 (12)	16.40 (13)	33.74 (12)	
Punjab	451.96 (1)	943.52 (1)	132.70 (2)	250.27 (1)	66.21 (2)	144.01 (1)	27.57 (2)	57.64 (2)	
Rajasthan	264.91 (8)	539.24 (9)	82.26 (8)	181.59 (9)	41.06 (9)	94.18 (8)	26.32 (3)	60.04 (1)	
Tamil Nadu	267.93 (7)	594.83 (6)	95.78 (5)	234.30 (2)	45.11 (6)	112.72 (5)	22.80 (6)	50.29 (3)	
Uttar Pradesh	206.41 (14)	428.53 (14)	48.98 (14)	125.32 (14)	30.78 (14)	74.68 (13)	10.62 (14)	29.39 (14)	
West Bengal	230.66 (11)	430.90 (13)	85.44 (7)	166.09 (11)	38.43 (10)	92.05 (10)	22.82 (5)	36.32 (10)	
Mean	281.41	578.30	86.05	187.37	45.49	99.45	20.78	41.58	
Standard Deviation	75.99	146.43	24.99	38.06	14.49	21.26	5.79	9.78	
Coefficient of Variation(%)	27.00	25.32	29.04	20.31	31.85	21.37	27.84	23.51	

\* Figures relate to three-year averages centered on the years shown.

Note : Figures in parentheses are ranks.

RTE : Real per capita total expenditure

RSE : Real per capita social expenditure

REDN : Real per capita educational expenditure

RMPH : Real per capita medical, public health ,family welfare and water supply and sanitation expenditures.

**Table 4 : Rates of Growth in Real Per Capita Expenditures**

(Per cent)

States	RTE		RSE		REDN		RMPH	
	1974-75 To 1984-85	1985-86 To 1991-92	1974-75 To 1984-85	1985-86 To 1991-92	1974-75 To 1984-85	1985-86 To 1991-92	1974-75 To 1984-85	1985-86 To 1991-92
Andhra Pradesh	6.22	1.98	8.59	0.73	7.31	3.00	7.21	-1.84
Assam	8.22	3.88	8.14	1.00	6.30	2.79	7.62	1.45
Bihar	7.09	3.35	9.49	5.07	9.05	7.90	8.29	2.49
Gujarat	7.17	3.72	6.38	0.80	5.83	3.79	7.30	-2.40
Haryana	6.11	0.99	7.84	4.60	5.33	4.20	10.22	-2.78
Karnataka	6.57	1.37	5.86	2.46	4.67	4.64	4.41	-1.56
Kerala	5.19	1.47	4.65	-0.59	3.18	1.11	5.26	1.36
Madhya Pradesh	6.67	2.79	5.79	3.66	4.10	6.57	8.44	-1.69
Maharashtra	5.96	1.88	6.97	2.34	5.36	5.12	7.46	-3.54
Orissa	5.60	4.53	7.48	4.32	4.34	5.82	9.05	1.54
Punjab	6.53	4.56	4.13	3.26	5.19	7.09	5.37	3.28
Rajasthan	5.51	4.25	6.53	4.75	5.07	7.07	8.91	0.75
Tamil Nadu	7.64	3.73	7.49	4.43	5.57	6.10	9.53	2.13
Uttar Pradesh	5.93	4.94	7.82	5.61	4.53	8.29	10.26	2.40
West Bengal	5.74	1.89	6.91	3.65	6.94	5.20	4.97	2.14

**Table 5-A : Intra-Sectoral Allocation - Education**

(Per cent)

States	1985-86					1990-91				
	Elementary	Second- ary	Univer- sity & Higher*	Adult	Techni- cal	Elementary	Second- ary	Univer- sity & Higher*	Adult	Techni- cal
Andhra Pradesh	47.0	29.2	20.0	0.6	3.1	45.4	29.3	22.3	N.A.	3.0
Assam	60.1	25.8	10.5	1.4	2.2	58.5	27.7	11.3	0.5	1.9
Bihar	63.6	20.7	12.5	1.8	1.4	64.9	21.1	11.2	0.9	1.9
Gujarat	60.7	27.6	8.6	0.5	2.6	52.4	33.5	10.5	0.8	2.8
Haryana	40.2	42.9	13.6	1.2	2.2	46.2	35.2	14.6	1.6	2.4
Karnataka	54.9	22.9	18.4	0.9	2.9	52.8	28.7	14.5	1.2	2.9
Kerala	51.9	30.0	13.2	Neg	4.9	53.1	30.3	12.4	0.1	4.1
Madhya Pradesh	46.8	34.7	13.4	1.4	3.7	60.5	23.7	11.3	N.A.	4.5
Maharashtra	47.6	33.9	14.1	0.6	3.9	41.3	40.7	12.9	0.8	4.3
Orissa	42.7	38.9	15.0	0.9	2.4	55.9	24.7	14.6	0.9	3.9
Punjab	35.2	49.5	13.3	0.6	1.3	32.9	50.2	14.6	0.3	1.8
Rajasthan	54.4	33.2	10.1	1.1	1.2	55.3	32.6	9.3	1.0	1.7
Tamil Nadu	51.7	26.9	16.7	1.0	3.6	49.7	35.7	10.5	0.7	3.4
Uttar Pradesh	50.3	35.4	9.9	1.1	3.3	58.4	30.3	7.9	0.9	2.5
West Bengal	42.3	41.3	13.7	0.6	2.1	36.7	47.2	13.7	0.5	1.9
Mean	50.0	32.9	13.5	0.9	2.7	50.9	32.7	12.8	0.7	2.9

\* Including Pre-university Education.

**Table 5-B : Intra-Sectoral Allocation - Health**

(Per cent)

States	1985-86				1990-91			
	Medical	Public Health	Water Supply & Sanitation	Family Welfare	Medical	Public Health	Water Supply & Sanitation	Family Welfare
Andhra Pradesh	38.7	14.5	31.5	15.3	50.9	10.6	24.3	14.2
Assam	36.4	13.7	38.3	11.6	37.7	6.3	47.6	8.5
Bihar	39.5	7.7	38.3	14.5	50.0	10.4	21.5	18.2
Gujarat	41.4	16.3	24.8	17.6	51.1	11.6	24.6	12.7
Haryana	28.5	21.1	37.7	12.8	42.6	10.6	36.3	10.4
Karnataka	55.3	12.1	15.0	17.6	61.5	5.8	20.0	12.6
Kerala	63.6	8.0	17.0	11.4	57.3	6.3	23.6	12.9
Madhya Pradesh	31.4	11.4	43.3	13.9	44.4	7.8	37.5	10.3
Maharashtra	25.4	21.0	43.8	9.8	31.9	27.6	31.1	9.5
Orissa	38.9	12.9	34.5	13.8	44.6	12.4	26.6	16.3
Punjab	53.5	12.2	23.3	10.8	62.0	9.5	19.0	9.5
Rajasthan	28.8	6.2	55.7	9.4	34.8	5.2	50.9	9.1
Tamil Nadu	52.5	7.6	30.1	9.8	49.5	10.6	28.0	12.0
Uttar Pradesh	42.0	14.6	23.1	20.3	43.9	13.2	24.9	18.1
West Bengal	62.5	9.5	16.9	11.1	63.8	11.4	13.9	11.0
Mean	42.6	12.6	31.6	13.3	48.4	10.6	28.7	12.4

	1974- 75	1980- 81	1985- 86	1990- 91												
<b>Andhra Pradesh</b>	12.58	21.98	25.45	21.86	30.75	32.89	36.10	34.44	32.79	30.61	32.95	28.25	1.27	2.21	3.03	2.13
<b>Assam</b>	16.43	32.18	23.58	31.66	33.25	22.44	34.34	30.80	36.69	40.45	45.41	47.33	2.11	2.92	3.68	4.62
<b>Bihar</b>	13.80	29.80	25.21	28.53	28.96	25.11	32.38	32.94	46.05	46.18	45.41	46.58	1.84	3.46	3.71	4.38
<b>Gujarat</b>	18.23	21.87	21.77	22.18	33.51	28.76	36.33	31.40	31.26	35.29	41.57	38.79	1.91	2.22	3.29	2.70
<b>Haryana</b>	17.60	20.03	23.30	21.18	22.31	24.05	24.03	28.68	31.58	33.89	39.98	33.24	1.24	1.63	2.24	2.02
<b>Karnataka</b>	14.01	21.83	26.43	23.34	28.83	26.70	29.79	31.81	42.40	34.76	31.74	37.43	1.71	2.02	2.50	2.78
<b>Kerala</b>	16.52	22.34	30.12	29.36	44.13	45.23	42.79	39.91	47.33	38.83	30.62	38.50	3.45	3.92	3.95	4.51
<b>Madhya Pradesh</b>	14.33	25.96	26.56	25.60	34.87	24.83	32.36	34.03	37.46	39.15	36.89	38.30	1.87	2.52	3.17	3.34
<b>Maharashtra</b>	13.56	17.29	21.71	19.43	27.62	26.88	29.48	30.33	44.00	38.91	42.13	36.88	1.65	1.81	2.70	2.17
<b>Orissa</b>	17.17	27.18	23.76	30.73	30.26	29.05	32.60	29.48	32.39	29.98	32.78	39.76	1.68	2.37	2.54	3.60
<b>Punjab</b>	14.42	18.25	23.41	19.88	28.10	31.21	26.30	26.99	25.75	28.05	25.24	26.31	1.04	1.60	1.55	1.41
<b>Rajasthan</b>	16.28	27.14	27.60	26.90	33.21	28.77	32.28	34.47	45.93	47.08	52.39	47.70	2.48	3.68	4.81	4.42
<b>Tamil Nadu</b>	16.58	23.36	24.19	26.65	36.48	29.40	38.61	40.14	29.12	30.10	38.47	42.30	1.76	2.07	3.59	4.53
<b>Uttar Pradesh</b>	15.89	18.92	21.61	25.46	23.53	28.39	28.08	29.39	45.31	33.11	39.83	46.49	1.69	1.78	2.42	3.48
<b>West Bengal</b>	11.90	17.79	18.75	19.07	37.52	37.52	34.42	40.04	24.38	23.82	28.98	27.66	1.09	1.59	1.87	2.11
<b>Mean</b>	15.29	23.06	24.23	24.79	31.56	29.42	32.66	32.99	36.83	35.35	37.63	38.39	1.79	2.39	3.00	3.21

**Table 7 : Loadings of Principal Components**

Indicators	Component Loadings (1983 - 86)		Component Loadings (1988 - 91)	
	I	II	I	II
<b>Physical Infrastructure Indices</b>				
<b>Education Infrastructure</b>				
1) No. of primary and secondary schools per 100 sq.km.	0.4972	0.7736	0.8512	-0.2586
2) No. of primary and secondary schools per one lakh population	0.7874	0.0012	0.7819	0.4417
3) Teachers per 10,000 students	0.6074	-0.6348	-0.1353	0.9326
Percentage of Variance Explained	41.20	33.38	45.14	37.71
<b>Health Infrastructure</b>				
1) No. of Hospitals per 100 sq.km.	0.8054		0.6823	
2) No. of Dispensaries per 100 sq.km.	0.9221		0.8992	
3) No. of Primary Health Centres per 100 sq.km.	0.7418		0.7968	
4) No. of Hospital Beds per lakh population	0.7964		0.8455	
5) No. of Dispensaries per lakh population	0.7456		0.6011	
6) No. of Primary Health Centres per lakh population	0.7128		0.6803	
7) No. of Doctors per lakh population	0.8291		0.7645	
8) No. of Nursing Personnel per lakh population	0.9036		0.9325	
Percentage of Variance Explained	65.64		61.28	
<b>Nutrition Infrastructure</b>				
1) Fair price shops per one lakh population	-0.0036	0.9597	-0.1817	0.8797
2) Per capita foodgrains production (Kg.) (3 yrs. avg.)	0.9585	0.0150	0.9686	0.0346
3) Per capita milk production (Kg.)	0.9030	-0.2587	0.9319	-0.2176
4) Per capita fish production (Kg.)	-0.7135	-0.3121	-0.5668	-0.5806
Percentage of Variance Explained	56.08	27.14	54.03	28.99
<b>Educational Attainment</b>				
1) Percentage of Adult Literacy	0.9641		0.9715	
2) Percentage of Female Literacy	0.9659		0.9734	
3) Average No. of years of Schooling	0.7703		0.5062	
Percentage of Variance Explained	81.87		71.60	

**Table 8**  
**Scores of Attainment and Infrastructure Indices : 1983-86**

S t a t e s	Attainment			Infrastructure		
	Education	Health	Nutrition	Education	Health	Nutrition
1) Andhra Pradesh	2.3190	1.8125	1.7407	0.8460	3.9402	0.6101
2) Assam	1.8019	2.3173	2.2090	1.7165	3.9349	0.9581
3) Bihar	2.9177	2.3773	1.7768	1.2551	3.2221	0.7031
4) Gujarat	2.7611	2.0897	1.9431	0.7909	8.9143	-0.0499
5) Haryana	2.9454	1.8299	3.0969	0.7023	3.1783	2.9128
6) Karnataka	2.8363	1.5892	1.7586	1.0224	5.0108	0.1987
7) Kerala	4.6110	0.9064	1.9848	0.9415	12.6130	-0.9345
8) Madhya Pradesh	1.9485	2.5593	1.7216	1.0253	2.2861	1.1739
9) Maharashtra	3.2241	1.5297	1.6057	0.8920	10.5290	0.0730
10) Orissa	2.4141	2.6392	1.7550	1.5083	3.1600	0.6591
11) Punjab	3.0742	1.5188	2.7625	1.1620	20.2910	4.5624
12) Rajasthan	1.6959	2.3807	2.2289	0.7470	3.4789	1.5615
13) Tamil Nadu	3.1967	1.7569	1.7295	1.0366	5.8027	-0.0360
14) Uttar Pradesh	1.9142	2.9975	1.7613	1.0462	3.4374	1.2563
15) West Bengal	2.8476	1.6954	1.9255	1.9257	7.0526	-0.1041

**Table 9**  
**Scores of Attainment and Infrastructure Indices : 1988-91**

S t a t e s	Attainment			Infrastructure		
	Education	Health	Nutrition	Education	Health	Nutrition
1) Andhra Pradesh	2.1604	1.9218	1.7664	1.1586	3.5271	0.8406
2) Assam	2.3671	2.2312	2.2323	2.0045	3.4660	0.6173
3) Bihar	1.7309	2.2908	1.9707	1.4332	3.0078	0.5552
4) Gujarat	2.7747	2.0241	1.1769	0.8363	8.8548	-0.4013
5) Haryana	2.4414	1.8949	2.9922	0.9531	3.0005	2.8473
6) Karnataka	2.5251	1.8028	1.6443	0.8011	4.8419	0.2050
7) Kerala	4.1427	0.8961	2.1530	1.2199	18.7433	-1.8191
8) Madhya Pradesh	1.8938	2.7780	1.7178	1.2305	2.0569	1.1730
9) Maharashtra	2.8452	1.5818	1.6491	1.0878	9.1740	0.8106
10) Orissa	2.1810	2.7489	1.7254	1.7107	2.8558	0.3228
11) Punjab	2.7269	1.5798	2.6562	1.4768	15.8344	4.2463
12) Rajasthan	1.6196	2.2925	2.4030	0.9467	3.0403	1.3708
13) Tamil Nadu	2.8774	1.7723	1.7790	1.3058	5.8571	0.0810
14) Uttar Pradesh	1.8161	2.4640	1.9356	1.3140	3.3347	1.2280
15) West Bengal	2.6670	1.7210	2.1980	2.3865	5.4380	-0.2761

**TABLE No.10**  
**HUMAN DEVELOPMENT INDEX :**  
**DESCENDING ORDER OF STATES (1988-91)**

DESCENDING ORDER OF STATES			DESCENDING ORDER OF STATES		
SR. NO.	STATE	COMPONENT SCORES (USING SDP)	SR. NO.	STATE	COMPONENT SCORES· (USING LOG SDP)
1	PUNJAB	0.7215	1	KERALA	0.7343
2	KERALA	0.6709	2	PUNJAB	0.7215
3	HARYANA	0.6394	3	HARYANA	0.6626
4	MAHARASHTRA	0.5814	4	MAHARASHTRA	0.6116
5	WEST BENGAL	0.4643	5	WEST BENGAL	0.5318
6	GUJARAT	0.4487	6	TAMIL NADU	0.4985
7	TAMIL NADU	0.4303	7	GUJARAT	0.4950
8	KARNATAKA	0.3996	8	KARNATAKA	0.4658
9	ASSAM	0.3762	9	ASSAM	0.4441
10	ANDHRA PRADESH	0.3246	10	ANDHRA PRADESH	0.3928
11	RAJASTHAN	0.2561	11	RAJASTHAN	0.3231
12	ORISSA	0.2289	12	ORISSA	0.2960
13	UTTAR PRADESH	0.2224	13	UTTAR PRADESH	0.2892
14	BIHAR	0.1688	14	BIHAR	0.2118
15	MADHYA PRADESH	0.0858	15	MADHYA PRADESH	0.0858

## NOTES

1. Rolph Van Der Hoeven (1991) defines meso policies as those that "deal with the consequences of macropolicies on special target groups, the poor in particular. They encompass, the way taxes are collected, government expenditure is distributed, and how credit and interest rate policies, etc., are carried out in practice". Meso policies rely more on direct government intervention rather than on market forces.
2. A human development index constructed for 312 Indian districts in 1981 revealed considerable intra-state disparities (Prabhu, K.S., 1992). For example, with respect to Maharashtra, twentyfive districts which were considered in the analysis obtained ranks ranging from 16 for Pune to 210 for Chandrapur.
3. There has been considerable controversy regarding the 6 per cent norm. While Kolhatkar (1988) argues that if one were to include private expenditures, this norm has already been achieved, experts like Tilak (1990) strongly refute this contention.
4. A comprehensive study on private health expenditures conducted by the Foundation for the Research in Community Health (FRCH) in Jalgaon District of Maharashtra in 1987 revealed that a relatively high per capita expenditure of Rs.175 per annum. (Duggal and Amin, 1989). These findings are corroborated by a similar study conducted by the Kerala Shastra Sahitya Parishad (KSSP) in all villages in Kerala in 1989. This study indicated per capita expenditure of Rs.178 per annum (Duggal, 1992).
5. There is a distinct difference in the increase in the per capita availability of cereals and pulses, the two constituents of foodgrains. While the per capita availability of cereals increased from 334.2 grams per day to 443 grams per day between 1951 and 1992; the per capita availability of pulses declined from 60.7 grams per day to 33.4 grams per day over the same period.
6. The principal components procedure consists of redefining the original variables into a set of newly constructed orthogonal

variables. The relationship between the original variables and newly constructed variables (called principal components) is expressed by component loadings which are derived from the correlation matrix and used as weights in calculating component scores. Though the principal components method is more commonly used in situations where the researcher seeks to reduce the dimensionality of the problem, in the present analysis the procedure was used to derive a suitable weighting pattern. For further details see Harman (1960). For application of principal components method in identifying levels of development see Prabhu and Sarker (1992).

7. The component scores were calculated by making the indicators scale free by dividing each indicator by its arithmetic mean. The normal procedure of using standardised variables for calculation of component scores was not adopted in view of the fact that such a procedure distorts the dispersion of the original series (Kundu, 1980).
8. The following regression was obtained with life expectancy of states as the dependent variable.  
$$\begin{array}{l} LE = 69.56 - 8.22 \text{ MOR} + 2.07 \text{ NUT} \\ \quad \quad \quad (-11.53) \quad \quad \quad (2.25) \end{array}$$
$$n = 15, R^2 = 0.927$$

Figures in parenthesis are t-values  
where LE stands for life expectancy in 1985-86, MOR stands for mortality index in 1983-86. NUT stands for nutritional attainment in 1983-86.
- 9) Ravi Shankar (1988) states, "The problem of leakages in public educational expenditures is more than what could be called an "abuse of the system", it is engendered by the system itself." p.17.
10. The data on income distribution adjusted SDP of states were taken from Tarun Das (1992).

## REFERENCES

1. Akin John and Birdsall Nancy, 1987, "Financing of Health Services in LDCs", *Finance and Development*, Volume 24, Number 2, pp.40-43.
2. Antia, N.H., 1985, "An Alternative Approach to Health", Lecture delivered at the J.P. Naik Memorial Seminar held at the Indian Institute of Education, Pune on March 14, 1985.
3. Behrman, J.R., 1991, "Nutrition, Health and Development", in G. Psacharopoulos (ed) *Essays on Poverty, Equity and Growth*, Pergaman Press.
4. Bharadwaj, R., and K.K. Balachander, 1992, "Social Investment in Education and New Economic Policy Paper presented at the Meeting on New Economic Policies and Financing Education held at the National Institute of Educational Planning and Administration, New Delhi, September 28-30, 1992.
5. Centre for Monitoring Indian Economy, 1991,1992, *Basic Statistics Relating to Indian Economy*; Vol.I All India, Vol.II : States, Bombay.
6. Cochrane, Susan, 1979, *Fertility and Education : What Do We Really Know*, World Bank Staff Occasional Papers, Number 26, Published for the World Bank, The John Hopkins University Press.
7. Colclough, Christopher, 1980, *Primary Schooling and Economic Development : A Review of the Evidence*, World Bank Staff Working Paper 399, Washington D.C., World Bank.
8. Colletta Nat J. and Sutton Margaret, 1989, *Achieving and Sustaining Universal Primary Education : International Experience Relevant to India*, World Bank, Working Paper Series 166.
9. Dandekar V.M. and Nilkanth Rath, 1971, *Poverty in India*, Indian School of Political Economy.
10. Das, Tarun Kanti, 1992, "UNDP Human Development Index : Some Methodological Issues and Alternative Measures" Paper presented at the Conference of the Econometric Society of South and South East Asian Countries held at Bombay, December, 1992.
11. Demery L. and Demery D., 1991, "Poverty and Macroeconomic Policy in Malaysia, 1979-87", *World Development*", Vol.19, No.1. pp. 1615 - 1632
12. Duggal, Ravi, 1992, "Health Care Services and Financing in India", A Report for the Health Financing Review Mission of World Bank, Foundation for Research in Community Health, Mimeo.

13. Duggal, Ravi and S. Amin, 1989, "Cost of Health Care", Foundation for Research in Community Health, Bombay.
14. Foundation for Research in Community Health (FRCH) 1992, *State Sector Health Expenditures : A Data base All India and States*, FRCH, Bombay.
15. Gill, Sonya (ed), 1986, *Health Status of the Indian People - A Supplement to the ICSSR/ICMR Report Health for All : An Alternative Strategy*, FRCH, Bombay.
16. Gillespie S., and G. McNeill, 1992, *Food, Health and Survival in India and Developing Countries*, Oxford University Press, New Delhi.
17. Gopalan et al, 1981, *Nutritive Value of Indian Foods*, National Institute of Nutrition, Hyderabad.
18. Government of India, 1946, *Report of the Committee on Health Survey and Development (Bhore Committee)*, New Delhi.
19. Government of India, 1966, *Report of the Education (Kothari) Commission*, 1964-66, New Delhi.
20. Government of India, 1985, *Challenge of Education - A Policy Perspective*, New Delhi.
21. Government of India, 1986, *National Policy on Education, 1986*, New Delhi.
22. Government of India, 1989, *National Health Policy*, Lok Sabha Secretariat, Third Revised Edition.
23. Government of India, 1991a, Central Bureau of Health Intelligence, *Health Information of India*, Directorate of Health and Family Welfare, New Delhi.
24. Government of India, 1991b, Committee for Review of National Policy on Education, 1986, (Ramamoorthy Committee), New Delhi.
25. Government of India, 1991c, *Literacy Digest*, Ministry of Human Resources Development.
26. Griffin Charles C., 1992, *Health Care in Asia : A Comparative Study of Cost and Financing*, World Bank Regional and Sectoral Studies, The World Bank, Washington, D.C.
27. Haq, Mahboob-ul, 1992, "Human Development in India", Keynote address delivered at the Symposium on Economic Growth, Sustainable Human Development and Poverty Alleviation in India, Bombay.

28. Harman, H.H., 1960, *Modern Factor Analysis*, University of Chicago Press, Chicago.
29. Hoeven, Ralph Van Der, 1991, "Adjustment with a Human Face: Still Relevant or Overtaken by Events?" *World Development*, 19 (12), pp.1835-45.
30. Indian Council of Social Science Research (ICSSR) and Indian Council of Medical Research (ICMR), 1981, *Health for All : An Alternative Strategy*, Indian Institute of Education, Pune.
31. Kolhatkar, M.R., 1988, "Education Expenditure in India in Relation to National Income' (1980-1988) Trends and Implications" *Journal of Education and Social Change*, Vol.II(2), July-September 1988, pp 104-119.
32. Kundu, A., 1980, *Measurement of Urban Processes : A Study in Regionalisation*, Popular Prakashan, Bombay.
33. Lockheed, Marlaine, E., Jamison, Dean, T., and Lau, Lawrence, J., 1980, "Farmer Education and Farm Efficiency : A Survey" in Timothy King (ed), *Education and Income*, World Bank Staff Working Paper 402, Washington D.C., The World Bank.
34. Meller, P., 1991, "Adjustment and Social Costs in Chile During the 1980s", *World Development*, Vol.19, No.11 pp. 1545-61.
35. Minhas, B.S., 1991, "Educational Deprivation and its Role as a Spoiler of Access to Better Life in India", Technical Report No.9104, Indian Statistical Institute, New Delhi.
36. Mundel Sudipto and M. Govinda Rao, 1991, "Volume and Composition of Government Subsidies in India", 1987-88, *Economic and Political Weekly*, Vol.XXVI, No.14 pp. 1157-72
37. National Council for Educational Research and Training (NCERT), 1989, *Fifth All India Educational Survey*, New Delhi.
38. National Council of Applied Economic Research, (NCAER) 1992, *Household Survey of Medical Care*, New Delhi.
39. National Sample Survey Organisation (NSSO) 1989, Fortysecond Round (July 1986-June 1987) Report No.365, *Participation in Education Part II : Major States*.
40. Panchamukhi, P.R., 1987, "Leading Issues in Human Resources Development in India" in Brahmananda P.R., and V.R. Panchamukhi, (ed), *The Development Process of the Indian Economy*, Himalaya Publishing House, Bombay, pp. 1060-1108.

41. Planning Commission, 1992, *Eighth Five Year Plan 1992-97*, Planning Commission, New Delhi.
42. Prabhu, K.S., 1992 "Regional Dimension of Human Development in India : Implications for the Eighth Plan", mimeo, paper presented at the Seminar, "Issues Pertaining to the Eighth Plan" at the University of Bombay, April 16.
43. Prabhu K.S. and P.C. Sarker, 1992, "Identification of Levels of Development : Case of Maharashtra", *Economic and Political Weekly*, Vol.XXVI (36), pp. 1927-37.
44. Prabhu, K.S. and Sangeeta Kamdar, 1993, "Structural Adjustment with A Human Face : Inferences for India", Paper presented at the Seminar on 'New Economic Policy', Lala Lajpatrai College, Bombay, January 9.
45. Psacharopoulos, George, 1985, "Returns to Education : A Further International Update and Comparison", *The Journal of Human Resources*, Vol.20, No.4, pp.583-604.
46. Ramirez F.O. and J. Boli-Bennett, 1982, "Global Patterns of Educational Institutionalisation" in Altbach, P.G., R.F. Arnave and G.P. Kelly (ed), *Comparative Education*, Macmillan Publishing Co., New York.
47. Rao, Bhanoji, 1992, "A Note on Financing Education : Towards a Strategy for the 1990's and Beyond", *Journal of Educational Planning and Administration*, VI(1), January 1992, pp. 73-78.
48. Rao, Hemlata, 1984, *Regional Disparities and Development in India*, Ashish Publishing House, New Delhi.
49. Ravishankar, 1988, "India : Government Expenditures on Social Services : 1976-77 - 1986-87", World Bank New Delhi, Resident Mission, Mimeo.
50. Sawant. S.D., 1982, "Incidence of Under-Nutrition in Rural India : An Inter-Regional Perspective" *Indian Economic Journal*, 29 (4) April-June 1982. Pp.19-48.
51. Sen, A.K., 1983, "India : The Doing and Undoing" *Economic and Political Weekly*, Vol.XVIII(7), pp 237-240.
52. Sen, A.K., 1986, "How is India Doing?" in Basu, Dilip K. and Sisson Richard (ed.) *Social and Economic Development in India : A Reassessment*, Sage Publications, New Delhi,
53. Stewart, Frances. 1991, "The Many Faces of Adjustment", *World Development*, Vol.19, No.12 pp. 1847-1864.

54. Subbarao, K., 1989, *Improving Nutrition in India*, World Bank Discussion Paper No.:49, Washington D.C.
55. Sukhatme, P.V., 1982, "Poverty and Malnutrition" in P.V. Sukhatme (ed.), "Newer Concepts in Nutrition and their Implications for Policy", Maharashtra Association for Cultivation of Science, Pune.
56. Tan Jee-Ping and Mingat Alain, 1992, *Education in Asia : A Comparative Study of Cost and Financing*, World Bank Regional and Sectoral Studies, The World Bank, Washington D.C.
57. Tilak, Jandhyala B.G., 1990, "Expenditure on Education in India", National Institute of Educational Planning and Administration, mimeo.
58. Tilak, Jandhyala B.G., 1992, "Education and Structural Adjustment", Adjustment and International Co-operation, Paris, UNESCO.
59. Tilak, J.B.G., and N.V. Varghese, 1992, "Financing Elementary Education in the Eighth Five Year Plan", Background Paper prepared for Meeting on New Economic Policies and Financing Education, September, 1992, National Institute of Educational Planning and Administration, mimeo.
60. Tulasidhar, V.B., 1992, "States' Financing of Health Care in India : Some Recent Trends", National Institute of Public Finance and Policy, New Delhi, mimeo.
61. United Nations Development Programme 1991, 1992, *Human Development Report*, Oxford University Press, New York.

## **APPENDIX I**

### **A. Sources of Data on State Government Expenditures**

The major source of data on State Government Expenditures for this study are the annual articles on the "Finances of the State Governments" published in the RBI Bulletin. These have been supplemented by State Government budget documents as well as the combined Finance and Revenue Accounts of the Union and State Governments for details on intra-sectoral allocations of expenditures on education and medical and public health for certain years. The Combined Accounts have also been used to obtain the details necessary to adjust data according to a uniform classification. These are described subsequently. These sources have been supplemented by the data-base on State Sector Health expenditures brought out by the Foundation for Research in Community Health (FRCH).

2. Data on respective States' net domestic product for various years have been taken from the 'Statistical Appendix in the Economic Survey as well as the CSO's own publications. The Economic Survey has also been used to obtain the (General) CPI for Industrial Workers for different years. Data on population of the States for benchmark years i.e. 1981 and 1991 have been taken from Census 1991. The data for intermediate years have been estimated using figures on annual growth rates provided in Census 1991.

### **B. Adjustments in Data on State Government Expenditures**

On account of the revision in the classification of Government accounts, data on expenditures for the years 1985-86 (Accounts) and onwards are not strictly comparable with those of the earlier period. From the point of view of the present study, the major revisions relate to the shifting of expenditure on "Civil Supplies" (comprising consumer subsidies) from Social Services to Economic Services and the creation of a separate budget head for expenditure on "Nutrition" under Social Services as against the earlier practice of reporting it under the head "Food and Nutrition" under Economic Services. In our analysis, we have for the purpose of obtaining a uniform data set, excluded the (revenue) expenditure on Civil supplies, from the expenditures on Social Services for the years 1974-75 to 1984-85. For the same years, the expenditure on "Nutrition and subsidiary food" (NSF) have been added on to the expenditures on

Social Services. It may be mentioned here that for the years 1974-75 to 1984-85 data on "Food and Nutrition" included allocations for food subsidies and procurement and supply, both of which continue to remain part of Economic Services under the revised classification. The remaining expenditure on "Food and Nutrition" related to Direction and Administration, NSF etc. We have taken NSF as a proxy for Nutrition in the period 1974-75 to 1984-85. In any case, allocation for NSF during 1974-75 to 1984-85 formed a very small part of total expenditure for all States except Tamil Nadu and that too since 1982-83.

### C. Definitions and Concepts

Budget documents classify expenditures (and receipts) under Revenue and Capital Accounts; the former representing disbursements for current purposes and the latter for creation of assets, repayment of debts and loans and advances to others. For our analysis, we have obtained total public expenditure and social sector expenditures as the sum of revenue and capital disbursements including loans and advances. Social sector expenditures comprise allocations for education, medical and public health, water supply and sanitation, nutrition, housing and urban development, welfare schemes for backward classes etc. With respect to expenditures on education and health, we have ignored the loan component as it forms a small part of the total expenditure on these heads. Furthermore, expenditure on education is taken to include Sports and Youth Services and Art and Culture, items which, again, account for a minor share of total expenditure on education. The analysis of the intra-sectoral allocations of education (Section IV) has been restricted to revenue expenditures only as it constitutes the predominant share in total allocations for education. For the same reason, the intra-sectoral analysis of health expenditures in this Section is confined purely to the revenue expenditures on the budgetary heads, "medical", "family welfare", and "public health". With respect to "water supply and sanitation" however, capital disbursements (alongwith revenue expenditures) are also included for they are quite significant in a number of States. Social priority expenditures referred to in the Study, relate to the revenue expenditures on (1) elementary education (2) preventive health care (3) nutrition and (4) both revenue and capital disbursements on water supply and sanitation. Revenue expenditure on public health and family welfare (excluding certain items such as training, research and statistics) have been taken as preventive health expenditures.

## APPENDIX II

The Indicators used for the Attainment and Infrastructure Indices for 1983-86 and 1988-91 are given below :

I] **Attainment Indices :-**

A) **Education Attainment Indicators.**

- 1) Adult Literacy Rate (1984-85), (1990-91)
- 2) Female Literacy Rate (1984-85), (1990-91)
- 3) Average No. of years of schooling. The average number of years of schooling of a cohort was calculated as follows in three simple steps.
  - a. Current enrollment ratio in secondary schools X 4 years;
  - b. [(Enrollment ratio in primary schools four years earlier) minus (the current enrollment ratio in secondary schools)] X 5 years;
  - c. In the third stage the number of years obtained in steps A and B were added to obtain the average years of schooling.

This exercise was carried out with primary school enrollment ratios in 1980-81 and 1984-85 and secondary school enrollment ratios in 1984-85 and 1987-88 for the two time points.

B) **Health Attainment Indicators**

- 1) Crude death rate - 3 years average : (1984-86) (1988-90);
- 2) Infant Mortality Rate - 3 years average : (1984-86) (1988-90).

C) **Nutrition Attainment :**

**Indicators.**

- 1) Consumption expenditure per capita on cereals, gram and cereal substitutes. : (1983), (1986-87)
- 2) Consumption expenditure per capita on pulses : (1983), (1986-87)

- 3) Consumption expenditure per capita on milk & milk products : (1983), (1986-87)
- 4) Consumption expenditure per capita on meat, eggs & fish : (1983), (1986-87).

For calculating the index these indicators were divided in two groups: (i) per capita consumption expenditure on calories (ii) per capita consumption expenditure on proteins.

Per capita consumption expenditure on calories = per capita consumption expenditure on cereals, grams and cereal substitutes;

whereas Per capita consumption expenditure on proteins = per capita consumption expenditure on pulses, milk & milk products, meat, eggs and fish.

## II] Infrastructure Indices

### A) Education Infrastructure Indicators

- 1) No. of primary schools & secondary schools per 100 sq.km. : (1985-86) (1990);
- 2) No. of primary schools & secondary schools per lakh population : (1985-86) (1990);
- 3) No. of teachers (Primary + secondary; both trained and untrained) per 10,000 students (primary + secondary) (1985-86) (1987-88).

### B) Health Infrastructure Indicators

- 1) No. of dispensaries per 100 sq.km. : (1985), (1989)
- 2) No. of primary health centres per 100 sq.km. : (1985), (1989)
- 3) No. of hospital beds per lakh population : (1985), (1989)
- 4) No. of dispensaries per lakh population : (1985), (1989)
- 5) No. of primary health centres per lakh population : (1985), (1989)
- 6) No. of doctors per lakh population : (1985), (1987)
- 7) No. of nursing persons per lakh population : (1985), (1987).

### C) Nutrition Infrastructure Indicators

- 1) Fair price shops per lakh population (2 years average) : (1985, 1986), (1990, 1991)
- 2) Per capita foodgrains production (Kg.) (3 years average) : (1984-86), (1988-91)
- 3) Per capita production of milk (Kg.) : (1985-86) (1989-90)
- 4) Per capita production of fish (Kg.) : (1985-86), (1989-90)

### Sources of Data

1. Centre for Monitoring Indian Economy (Vol.II) : States; Various Issues.
2. Central Statistical Organisation, Statistical Abstract of India, various issues.
3. Das, Tarun Kanti, 1992, "UNDP Human Development Index - Some Methodological Issues and Alternative Measures".

### UNDP's Methodology for Constructing the Human Development Index

The Human Development Index (HDI) combines three main components of development, viz., longevity, knowledge and income. Longevity is represented by life expectancy at birth. Educational attainment is a weighted average of two educational stock variables, adult literacy and average years of schooling, the weights being two-third and one third respectively. Income is adjusted using Atkinson's formulation of the utility function.

A country's deprivation with respect to each of the above indicators is calculated using the following formula :

$$I(i,j) = \left[ \frac{\{ \text{Max } X(i,j) - X(i,j) \}}{\text{Range}(i)} \right]$$

where

$I(i,j)$  = Deprivation indicator for jth country  
with respect to ith variable;

$X(i,j)$  = Value of ith variable for jth country

$\text{Max } X(i,j)$  = Maximum of  $X(i,j)$  across countries

$\text{Range}(i)$  = Range of the ith variable across countries.

In the next step, an average deprivation indicator  $I(j)$  for each country is calculated by taking a simple average of the deprivation indicators :

$$I(j) = \frac{1}{3} \sum_{i=1}^3 I(i, j)$$

The human development index for the  $j$ th country is then derived as  
(1 - average deprivation index) i.e.  
 $HDI(j) = 1 - I(j)$

## **APPENDIX III**

### **Nutrition Infrastructure : A Revised Index**

Nutrition infrastructure in this study was deemed to consist of the following indicators :

- (1) per capita production of foodgrains
- (2) per capita production of milk
- (3) per capita production of fish
- (4) fair price shops per one lakh population.

As is evident, the indicators used contain aspects of production as well as distribution. The variable which affects nutritional intake more directly is per capita availability of foodgrains, milk, fish etc., rather than their mere production within the state. However, in the absence of data regarding net availability of food products at the state level for the requisite time points, production figures were used instead. This procedure therefore, makes no allowance for inter-state movement of food items. Other researchers in the field (Sawant, 1982, and Subbarao, 1989) have also adopted a similar procedure while analysing state level nutritional status.

In the case of distribution of foodgrains, it is obvious that the mere existence of fair price shops does not guarantee the availability of foodgrains and other articles through these outlets. Data regarding the percentage of total purchases of households obtained through the Public Distribution System (PDS) were available through NSS data on 'Utilisation of Public Distribution System' published in Sarvekshana, April-June, 1990. The data relate to the year 1986-87. These data have been used to construct a revised index of nutrition infrastructure for one time point, *viz*, 1983-86. Details regarding the procedure following are given below.

Two separate indices representing production and distribution of food were constructed using the principal components method for 15 major states for the period 1983-86. The indicators used in the analysis are listed below.

### **Production Index**

- (1) Per capita production of foodgrains (PCPG)
- (2) Per capita production of milk (PCPM)
- (3) Per capita production of fish (PCPF)

### **Distribution Index**

- (1) Percentage of total quantity of rice purchased through PDS - Urban (PDSRU)
- (2) Percentage of total quantity of wheat purchased through PDS - Urban (PDSWU)
- (3) Percentage of total quantity of rice purchased through PDS - Rural (PDSRR)
- (4) Percentage of total quantity of wheat purchased through PDS - Rural (PDSWR)
- (5) Number of fair price shops per lakh population (FPSLP)

The loadings of the indicators on the first principal component were as follows:

<u>Production Index</u>		<u>Distribution Index</u>	
Indicators	Component Loadings	Indicators	Component Loadings
1. PCPG	0.9586	PDSRR	0.8688
2. PCPM	0.90207	PDSWR	0.9247
3. PCPF	-0.7138	PDSRU	0.9172
4.		PDSWU	0.8654
5.		FPSLP	-0.2171

The ordering of the states on the basis of the component scores (calculated with the help of the component-loadings) is given below.

Descending Order of States in

Sr. State No.	Production Index		Distribution Index	
	State	Component Score	State	Component Score
1. Punjab	6.6879	Kerala		11.0119
2. Haryana	4.2555	Tamil Nadu		6.0142
3. Rajasthan	2.1778	Gujarat		5.6376
4. Uttar Pradesh	1.7622	Karnataka		5.4529
5. Madhya Pradesh	1.5305	West Bengal		5.1230
6. Bihar	0.6610	Maharashtra		4.8856
7. Andhra Pradesh	0.5844	Andhra Pradesh		4.8791
8. Assam	0.4777	Rajasthan		1.7744
9. Orissa	0.4529	Assam		1.7171
10. Karnataka	0.1999	Madhya Pradesh		1.1823
11. Gujarat	0.1163	Orissa		1.1116
12. Maharashtra	-0.0658	Uttar Pradesh		0.7660
13. Tamil Nadu	-0.0677	Haryana		0.6992
14. West Bengal	-0.1414	Bihar		0.0806
15. Kerala	-1.3182	Punjab		0.0471

As is evident, the ranking of Kerala changes dramatically with respect to production and distribution. The State's lowest position with respect to production is adequately compensated by a well distributed and relatively

effective public distribution network which enables it to obtain the highest rank with respect to distribution. The same observations are true, though to a lesser extent, with respect to Karnataka, Tamil Nadu, Gujarat and West Bengal. In general, the States with low ranks with respect to production fared relatively better in terms of distribution. The scores of both the production and distribution indices were combined giving equal weights so as to obtain the ordering of states with respect to nutrition infrastructure. The ranking of states using the revised index along with the ranking obtained by earlier in the study are set out in the following Table.

**Ranking of States According to  
Nutrition Infrastructure - 1983-86**

Sr. No.	S t a t e s	<u>Nutrition Index</u>	
		<u>Original</u>	<u>Revised</u>
1.	Andhra Pradesh	5	6
2.	Assam	3	13
3.	Bihar	7	15
4.	Gujarat	15	4
5.	Haryana	2	8
6.	Karnataka	11	5
7.	Kerala	14	1
8.	Madhya Pradesh	6	11
9.	Maharashtra	10	9
10.	Orissa	4	14
11.	Punjab	1	2
12.	Rajasthan	8	10
13.	Tamil Nadu	12	3
14.	Uttar Pradesh	9	12
15.	West Bengal	13	7