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NATIONAL MASTER PLAN INDIA

INTERNATIONAL DRINKING WATER
SUPPLY AND SANITATION DECADE
1981-1990



MINISTRY OF WORKS AND HOUSING
GOVERNMENT OF INDIA
NEW DELHI
JULY, 1983

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INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

GOVERNMENT OF INDIA

NATIONAL

MASTER PLAN

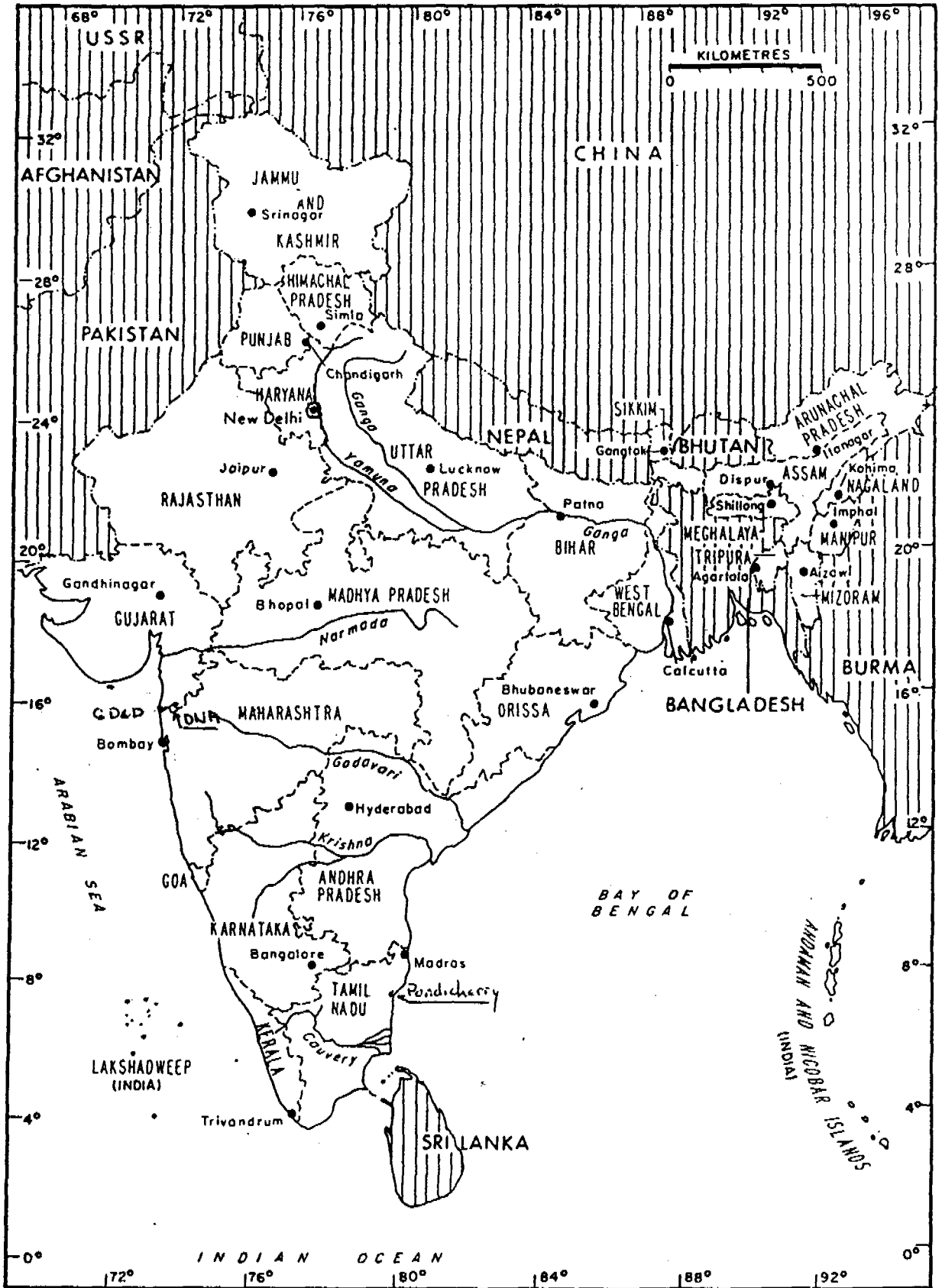
FOR

WATER SUPPLY AND SANITATION
(APRIL 1981 - MARCH 1991)

JULY 1983

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UNION TERRITORY DECADE PROGRAMMES

STATES

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Bihar	Nagaland
Gujarat	Orissa
Haryana	Punjab
Himachal Pradesh	Rajasthan
Jammu & Kashmir	Sikkim
Karnataka	Tamil Nadu
Kerala	Tripura
Madhya Pradesh	Uttar Pradesh
Maharashtra	West Bengal

UNION TERRITORIES

Andaman & Nicobar Islands	Delhi
Arunachal Pradesh	Goa, Daman & Diu
Chandigarh	Lakshadweep
Dadra & Nagar Haveli	Mizoram
	Pondicherry

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PART I

NATIONAL MASTER PLAN OF WATER SUPPLY AND SANITATION

INTRODUCTION

The United Nations Conference on Human Settlements held in June 1976 at Vancouver, British Columbia, recommended that safe water supply and hygienic waste disposal should receive high priority from Governments and International Agencies to enable Governments to achieve the target of serving all the population by 1990. These objectives were reiterated in the United Nations Water Conference at Mar del Plata, Argentina, in March 1977 and when it was further, declared that the ten year period 1981-90 be designated as the 'International Drinking Water Supply and Sanitation Decade'. The Conference requested closer co-operation among international organisations, and increased technical and financial assistance from external bilateral and multi-lateral agencies, in order to achieve the goals of safe water supply and adequate sanitation by the year 1990.

The 31st United Nations General Assembly, meeting in late 1977, approved the recommendations of the Water Conference. The International Conference on Primary Health Care at Alma Ata, USSR, in September 1978, emphasised that water supply and sanitary facilities must be provided to the people in the developing countries, since a preponderant percentage of the sickness and disease in the developing countries is attributable to contaminated water and inadequate sanitation.

India was a party in all these conferences and subscribed to the Resolution of the 31st United Nations General Assembly, pledging its full support for the International Decade Programme.

India arrives at the launching of the Decade with 50 years or more of organised efforts on the part of the Government showing steady progress in providing water supply and sanitation services to her many millions of inhabitants.

Organised water supply systems were attempted first in the three Presidency Towns of Calcutta, Bombay and Madras in the late '18-seventies'. Through the subsequent decades, measures to secure better health for the people found emphasis on the curative side. Water-borne and filth-borne epidemics were combated with drugs and vaccines. Preventive health measures were organised as palliatives in order to ward off periodic epidemics. A few towns came in for the benefit of protected water supply more due to the stress of local urgency and recurring epidemics, than under any organised plan or programme.

The responsibilities for health and health measures were transferred by the Central Government to the Provincial Government, who in turn, transferred the burden on to the local-bodies. As a result, the history of the struggle of the local-bodies for these essential amenities - safe water supply and sanitation measures - for over half a century was difficult resulting in few systems. A few of the local-bodies, however, succeeded in prevailing on the Provincial Government to install limited water supply systems, most of them heavily subsidised by the Governments. Local-bodies kept these systems going through the years without any improvements necessary to meet the growing demands from the increasing populations. These few water supply systems soon reached acute stages of inadequacy for the needs of the towns.

(ii)

With the advent of popular Ministries just before the Second World War, there was a sharp spell of an intensive programme to meet the challenge of water supply, particularly in the rural areas, in Bengal, Madras, Bombay and Mysore (old designations). A programme of rural water supply on a province-wide basis was planned and a tangible measure of progress achieved before the war intervened.

In the Post-War Developmental era, the Bhole Committee came into being and for the first time pin-pointed attention to the importance of safe water supply and sanitation measures on a country-wide basis. They assumed importance in the National Developmental Plans. The Madras Government followed by appointing a Committee - in 1947, to examine and report on the question of water supply and drainage for urban and rural areas in the entire State. The Committee came out with far-reaching recommendations in regard to organisation, finance, materials of construction and priorities.

The Environmental Hygiene Committee (1948-49) appointed by the Union Government was the first agency of its type charged with an overall assessment of the country-wide problems in the entire field of Environmental Hygiene. The Committee made notable recommendations in the broader field of Environmental Hygiene and urged for greater activity in this direction. They recommended specifically a comprehensive plan to provide water supply and sanitation facilities for 90 per cent of the population within a period of 40 years and also suggested a scheme of priorities for certain areas.

As part of the post-war reconstruction activities, some of the States initiated their Five Year Plans in which provision was included for the implementation of urban and rural water supply and sanitation schemes. Some headway was being made in this direction, but the States soon came up against formidable obstacles in the way of raising finances for such schemes, building up of organisations, and in the procurement of proprietary materials needed for such schemes.

Over the past 30 years from 1951, through five Development Plans and several intervening Annual Plans, to 1981 and start of the Decade, water supply and sanitation sector expenditures compared with total Development and Annual Plan outlays increased by over 2.5 times, and population coverage in urban and rural water supplies and urban sanitation services reached over 75 percent, 30 percent and 25 percent, respectively. This gives some indication of the high priority that the Government has given to the water supply and sanitation sector - and bodes well for the success of the Decade Programme.

In preparation for the India Decade Programme many activities in pursuit of Decade objectives have been and are now being carried out. Important at the outset among these activities was the Government's decision in its selection of the Central Public Health and Environmental Engineering Organization (CPHEEO) of the Ministry of Works and Housing as the Technical Office to serve as the National Coordinator and focal point in respect of activities connected with the International Drinking Water Supply

and Sanitation Decade. The CPHEEO provides guidelines and assistance to the 22 States and 9 Union Territories in the development of their Decade programmes, and convenes national and regional conferences of chief and senior public health engineers and other sector authorities to promote and advance Decade activities. It collaborates with various multi-lateral organizations as the UNDP, WHO, UNICEF, ESCAP and the World Bank in the furtherance of these activities.

Additionally, during the preparatory phase:

- rapid assessment was made of the status of drinking water supply and sanitation, in collaboration with the World Health Organization;
- sector studies and briefs were prepared in respect of almost all the States and Union Territories;
- a series of Conferences of Chief Engineers/Public Engineers of all States and Union Territories were convened at Delhi, Nagpur, Trivandrum, Ootacamund and Hyderabad from November 1978 to December 1980;
- two Conferences of State Ministers, Secretaries and Chief Engineers were held in February 1982 and January 1983 respectively wherein the Decade goals were accepted and the recommendations of the three Working Groups of the Apex Committee have also been endorsed.
- a regional consultation meeting was held at New Delhi by WHO in November 1979 to enable participants from countries of the South-East Asia Region and international agencies to review preparatory actions for the Decade. India attended with representation from the Planning Commission, CPHEEO and Technical Cooperation, Ministry of Finance. A follow-up regional consultation meeting was held in September/October 1981 wherein support programmes such as manpower development, community education and participation, operation and maintenance of water supply projects as well as water quality surveillance were discussed.

Recognising the need for coordinated action and approach to achieve the targets, the Government of India on 16 October 1980, constituted an Apex Committee under the direction of the Secretary, Ministry of Works and Housing. This Committee is responsible for national policy formulation and guidance, and overview of the programmes to be undertaken during the Decade.

The Apex Committee established three Working Groups, (1) Programmes and Manpower, (2) Financial Resources and (3) Materials and Equipment, to develop specific and comprehensive recommendations on these activities. The Apex Committee has agreed that targets established for the Sixth Plan period as well as those for the remaining years of the Decade could be adopted in preparing the National Master Plan Document.

The foregoing historical review shows the importance attached to drinking water supply and sanitation by the Union of India - both the Central and the State Governments. In fact, this sector, particularly rural water supply, is one of the elements in Government of India's 20 - Point Programme for socio-economic development. The inspiring message given by the Prime Minister of India (attached to this introduction) through World Health, the official magazine of the World Health Organization, to the international community thus comes as no surprise.

The preparation of National Master Plan for the water and sanitation sector for a country of nearly 700 million population is not an easy task, especially as the responsibility for planning and implementing in this subject area rests with the State Governments and Union Territories, with the Union Government providing broad guidance and directives and financial allocations as well as coordination at the national level. There are programmes such as the Accelerated Rural Water Supply Programme, which are directly centrally funded but water supply and sanitation is essentially a State subject. The National Master Plan is really a composite of the 31 State and 9 Union Territory Decade plans providing guidelines to action and programme goals, policies, priorities and funding. This explains why an extensive and intensive process of consultation within the States and between the States and the Union Government had to take place before the Plan document could be finalised. The tremendous volume of work that has been involved in preparation of this Master Plan document has been done mainly by the State Governments and the Union Government of India (Ministry of Works and Housing and the Central Public Health and Environmental Engineering Organization under that Ministry) with the collaboration of the World Health Organization and the United Nations Development Programme.

The International Drinking Water Supply and Sanitation Decade for India is from 1 April 1981 to 31 March 1991. This Decade period is coordinated with three Development Plans, embracing the last four years of the current Sixth Development Plan (April 1980 - March 1985), all five years of the Seventh Development Plan (April 1985 - March 1990) and the first year of the Eighth Development Plan (April 1990 - March 1995).

The Water Decade 1981-1990

Divine Waters

by the Right Honourable Mrs Indira Gandhi
Prime Minister of India



*Gracious be divine Waters for
our protection, be they for our drink,
And stream on us bliss and happiness.
Sovereigns over precious things
and Rulers over men, Waters!
We seek healing balm of you.*

This is an invocation from India's ancient religious book, the *Rigveda*.

Water is essential to life, and civilization is something of a dialogue between man and water. The earliest humans settled on river banks, besides lakes and on the sea coast, and there too flourished agricultural and much of industrial activity. The proper management of water, for domestic and economic purposes, is a basic aspect of social management and government.

A distinguishing characteristic of an advanced country is the provision of clean drinking water to its people in urban and rural areas. Economically backward societies, most of which are in tropical or desert zones, have a high incidence of water-borne disease. But they do not have the large financial, technological and managerial outlays which modern sanitation demands. Their people also lack the education and the means to change their personal habits.

Historians remind us that in the middle of the nineteenth century, when Britain was the world's dominant industrial and military power, its rivers were open sewers and cholera, dysentery and typhoid were widely prevalent. Sanitation follows scientific progress. This fact has to be remembered when the poor sanitation in developing countries is commented upon caustically. I am told that as late as 1960 there were areas in Scotland which had neither drinking water nor electricity.

Today mankind as a whole has the knowledge and the means to ensure basic sanitation all over the world. International cooperation can and must supplement the inadequate resources of poor countries to ensure the supply of clean drinking water and improve their arrangement for sewage disposal. I welcome the plans of the World Health Organization to

observe the "International Drinking Water Supply and Sanitation Decade". Every nation should offer its fullest cooperation to the Organization so that the World Health Assembly's resolve to provide clean water for all the people of the world by 1990 can be a reality.

Science can be a tremendous help to mankind but wrong or shortsighted short-term uses can cause incalculable harm. Modern technology may have cleared the dust of poverty but it has spread its own pollution which is destroying our environment. The vast arsenals of armaments are a hideous hoard of death and devastation. New chemical poisons are affecting even the unborn, crippling and deforming children. The ozone layer is already being recklessly endangered. Man is sullyng the oceans and scattering garbage in outer space!

In many countries, unregulated development has meant private affluence and public squalor. The developing countries have rightly adopted the planned approach, which combines public and private good. Technology as developed in the West has involved the mechanization of many functions, and also the input of vast quantities of energy, both calling for large investments. Developing countries need employment-creating and energy-conserving technologies, also the more natural ones which have not yet been fully developed. Fortunately, waste-disposal can itself be a major generator of energy, supporting numerous small crafts and industries.

In a world where fossil fuels are being fast depleted, organic human and cattle residues can produce biogas which can be utilized as fuel. We in India have undertaken indigenous research in this field. We should encourage programmes to promote cleanliness along with prosperity. One of our major objectives is to provide safe drinking water to all of our 560,000 villages.

May the United Nations Water Decade prove to be an example of international cooperation in helping people everywhere to realize one of their basic needs—a clean living environment.

Indira Gandhi

1. SOCIO-ECONOMIC AND HEALTH SITUATION

1.1 Socio-economic

The basic indicators for the States and Union Territories are shown in Table 1, Appendix I. The total population of India as at March 1981 has been estimated at 672.0 million and is the figure used in the development of the State and Union Territory Decade Programmes. India's population is forecast to reach one billion by the year 2000, even though at that time the rate of growth would decline to around 1.7 percent from the current 2.2 percent. Table A1 shows the estimated population at the beginning of the Decade Programme and at the end of Phase I and Phase II:

Table A1

ESTIMATED DECADE PROGRAMME POPULATION (in millions)			
Decade Programme	Urban	Rural	Total
Initiation, April 1981	148.4	523.7	672.1
End Phase I, March 1985	164.8	556.0	720.8
End Phase II, March 1991	194.4	604.6	799.0

India, with an area of 3.29 million square kilometers, has a population density of over 200 per square kilometer. The rural population accounts for 78 percent of the nation's total.

The country's economy performed well in 1981/82 and completed the recovery begun in 1980/81 from the severe draught and the sharp petroleum price increase of 1979/80. Agricultural production, the backbone of the nation's economy grew by four percent and the rapidly expanding industrial sector by more than eight percent. The country's Five-Year Development Plans have brought about technological transformation in its agriculture and industry and has provided a large reservoir of trained manpower, together with steady progress towards self-reliance.

While per capita income is relatively low it has shown an increase over the past decade. Under World Bank listing, India classified as a low income country, had a per capita Gross National Product (GNP) of US \$240 in 1980 prices and an annual growth rate of 1.4 percent. Table A2 provides information on the per capita Net National Product (NNP) over past years.

Table A2

Year	Current Prices (Rs.)	1970/71 Prices (Rs.)
1970/71	632.8	632.8
1974/75	1,005.9	617.6
1979/80	1,316.0	661.0
1980/81	1,536.9	696.3

The country's annual per capita income, while it has increased, remains low and generally reflects the problem of poverty which the Government continues to regard as the core of its development policies. Approximately, 48 percent of the total population live below the poverty line, over 50 percent in the rural area and 38 percent in urban communities. This has inevitably caused the Government to focus its attention to resolving the many problems of this half of the nation.

1.2 Health

Of these problems, health and social welfare, among others, are paramount to any real development. A significant majority of illness in the country is due to water-borne and water and sanitation related diseases. Poor socio-economic conditions and lack of sufficient safe water supplies and adequate sanitation contribute to this situation.

High infant mortality rates exist in most of the States and Union Territories, being very high especially in the rural areas. These rates have remained at high levels for many years. Table A3 gives infant mortality data from 1970 to 1978, the latest year of record:

Table A3

Infant Mortality (per 1,000 live births)			
Year	Urban	Rural	Combined
1970	90	136	129
1971	82	138	129
1972	85	150	139
1973	89	143	134
1974	74	136	126
1975	84	151	140
1976	80	139	129
1977	67	142	129
1978	74	137	127

Diarrhoeal diseases of children and severe malnutrition are major contributors to the high proportion of deaths in infancy and childhood. Dysentery, cholera and Guinea-worm along with amoebic infections are widely prevalent in the country.

Acute diarrhoeal diseases incidence is estimated to be 500 per 1,000 in infants and 200 per 1,000 in pre-school children. About 1.5 million children under 5 years of age die each year. The incidence is higher in the age-group of 3-16 months and the peak incidence is 6-9 months. The important entero-pathogens are E. Coli Salmonella, Shigella, V. Cholerae and certain intestinal parasites. Rota-virus has emerged as an important cause of diarrhoea in infants. The important cause of death in all cases of diarrhoea is dehydration, with fatality in untreated cases of severe dehydration as high as 60 to 70 percent.

In 80 districts of seven States, there are 12.2 million inhabitants in over 10,500 villages with endemic guinea-worm. A list of the affected villages has been prepared by State public health engineering and environmental organizations and health directorates providing priority for the provision of water supplies and for the improvement of water sources.

1.3 20-Point Programme

For bringing the health and general social welfare problems of the nation into sharper focus, especially in the rural areas and some urban fringes, the Government, in addition to general programmes of development, initiated

a special activity in 1975, the 20-Point Programme. Through this programme, the Government continues to pursue a long-term comprehensive development plan across the broad spectrum of health, social welfare and education along with other sectors. The successful fulfillment of several targets brought about changes in economic and social areas necessitating a redefinition of the programme in January 1982.

Point No. 8 of the 20 Point Programme, regarding the supply of drinking water to all problem villages is extremely vital to the water supply and sanitation sector and the Decade Programme, since this particular Point has been assigned the highest priority of eight priorities in the State and Union Territory sector programmes. Other Points relating to irrigation systems (1) strengthened and expanded coverage of integrated rural development (3) and the accelerated programmes for the development of scheduled castes and tribes (7) are all indirectly linked to the rural water supply programme for each State and Union Territory. Resources for the execution for the sector segment of the 20-Point Programme have been allocated in the current Sixth Development Plan.

2. SECTOR POSITION

2.1 Water Supply and Sanitation

Table 2, Appendix I provides information on the status of the population served as of March 1981 with water supplies and sanitation in the States and Union Territories, and the Decade Programme coverage goals at the end of Phase I, March 1985 and Phase II, March 1991.

The sector position in 1981 on a nation-wide basis and the position in 1970 and 1975 of the estimated population served with water supplies and sanitation is shown in Table B1.

The progress made in total water supply coverage in the country since 1970 in both urban and rural areas was almost 2.5 percent annually, slightly over the annual growth rate in the nation's population. This was due in large part to the gains made in rural water supply, the growth rate in coverage reaching about 1.5 times that in the urban area. The urban water supply coverage was well below the annual population growth rate at 1.7 percent and did not keep pace. There are several reasons for this, but the main reason is probably the emphasis placed in sector planning in rural area development, where 78 percent of nation's inhabitants reside.

In sanitation, the situation is quite different and much more severe, especially in the rural areas in terms of reaching each individual or family with adequate sanitary facilities. While the service in technical terms is simple and primary, the large dispersed population, in some 576,000 villages, all with various cultural, social and religious practices, and low levels of literacy, constitutes a formidable problem.

Table B1

Population Served (in millions)						
Category	1970		1975		1981	
	Population	%	Population	%	Population	%
Water Supply						
Urban	66.3	60.8	107.0	83.8	115.48	77.8
Rural	25.0	5.7	86.0	17.9	162.07	30.9
Total	91.3	16.7	195.0	32.1	277.55	41.3
Sanitation						
Urban	30.0	27.5	35.5	27.8	39.93	26.9
Rural	.5	.1	1.7	.4	2.80	0.5
Total	30.5	5.6	37.2	6.1	42.73	6.4

By contrast, urban sanitation services to the population residing in cities is more manageable from a project view point and can be provided with these services on a community or group-wise basis. This fact alone encourages action on the part of sector authorities, even though systems are more technically complex and more costly. From 1970 to 1981, an estimated average of over 30 percent had sanitation coverage in urban areas, whereas in the rural areas adequate sanitation was around one percent and at 1981 was 0.5 percent. Statistical information regarding sanitation in the rural areas is almost non-existent, so that even the reported 1981 coverage may not be correct.

2.2 Development Plan Allocations and Expenditures

In terms of budgetary expenditures during the past two decades, Table B2 provides information on total development plan outlays and the allocations in those plans to the water supply and sanitation sector:

The percentage of sector expenditures to total development plan outlays has been increasing from a modest 1.23 percent in the Third Development Plan to 4.01 percent in the current Plan. The amount of funds to the sector in the current plan is the anticipated allocation with the percentage as shown. The progress of expenditures during the first three years of the Sixth Development Plan and the proposed outlays for the fourth year are as in the Table B3.

Table B2

Development Plan	Total Plan Outlay ¹	WS & S Sector ¹	
	(Rs. crores)	(Rs. crores)	% of total
Third (1961-66)	8,576.5	105.7	1.23
Annuals (1966-69)	6,625.4	102.7	1.55
Fourth (1969-74)	15,782.5	458.9	2.91
Fifth (1974-79)	39,462.2	1,091.6	2.77
Annual (1979-80)	12,176.5	387.6	3.18
Sixth (1980-85)	97,500.0	3,907.8	4.01
Total	180,087.1	6,054.3	3.36

¹ Government of India, Economic Survey 1982-83

Table B3

Year	Total Plan Outlay	Actual/Anticipated Expenditure/Outlay	As % of the total
1980 - 85	3,907.80	-	-
1980 - 81	-	524.20	13.4
1981 - 82	-	659.31	16.9
1982 - 83	-	717.59	18.4
1983 - 84	-	913.46	23.3
Total for 1980 - 84		2,814.56	72.0
Balance to be provided for 1984 - 85		1,093.24	28.0
Rupees in Crores			

Considering the increase of expenditures in successive years of the plan period going from 13.4% to 23.3%, it can safely be assumed that provision of the full outlays for the Sixth Development Plan covering Phase I of the Decade Programme, will be achieved. The remaining six years of the Decade Programme or Phase II will require a sector percentage of total Plan outlays of at least six to seven per cent.

3. DECADE PROGRAMME GOALS

3.1 General

The Decade Programme should not be interpreted merely in terms of higher physical targets and more finances, but more importantly as an opportunity to carry out much-needed reforms in the processes of planning, implementation, monitoring, operation and maintenance of water supply and sanitation projects, so that facilities that are constructed and maintained efficiently and at reasonable cost are assured particularly to the rural and urban poor who need them critically. In the absence of such reforms, additional finances may not be used effectively or may remain unutilised or may even be diverted to benefit groups other than those who need these basic facilities most.

3.2 Water Supply and Sanitation

As at the end of the first year of the Sixth Development Plan, 31 March 1981, the start of the Decade Programme, an estimated 395 million population or about 58.7 percent of the total population were without safe water supplies, 302 million in the rural area and 93 million in the urban. In sanitation, the problem is even more severe in that there were some 629 million population or 94 percent of the country's total inhabitants without an adequate and sanitary means of excreta disposal, 521 million or practically the entire rural area and 108 million or 73 percent of the urban population.

In view of these low levels of coverage, particularly in the area of sanitation, and to bridge the existing wide gap in service, the following Decade targets to be reached by March 1991, have been agreed to by the Central Government in concert with the States and Union Territories:

<u>Sector Category</u>	<u>Coverage</u>	<u>Level of Service</u>
Urban Water Supply	100%	Piped water supplies in all communities, where feasible; demand range 70-250 lpcd, average 140 lpcd. Standposts in fringe areas, if necessary at strategic locations; demand range 25-70 lpcd, average 40 lpcd.

<u>Sectory Category</u>	<u>Coverage</u>	<u>Level of Service</u>
Rural Water Supply	100%	Piped water supplies for 30% of the population; demand range 25-70 lpcd, average 40 lpcd. Spot source water supplies for 70% of the population in the form of dug or tubewells with handpumps and/or power pumps; average demand 40 lpcd.
Urban Sanitation	80%	100% coverage for Class I cities with sewerage and sewage treatment facilities; low cost sanitation methods in other towns. Overall coverage of 80% in all cities and towns.
Rural Sanitation	25%	Low cost sanitary methods of disposal.

4. COVERAGE PROGRAMME POLICIES

4.1 General

The task is one of great magnitude and calls for careful planning and programming in achieving the Decade targets. The selection of projects for providing water supply and sanitation services must be realistic and determined by the resources available, commensurate with the minimum needs of the population to be served. The projects should serve the maximum population at appropriate service levels with minimum investment. Concepts of low cost and appropriate technology suiting local conditions will, therefore, play a crucial role.

The agencies responsible for the planning and implementation of water supply and sanitation programmes at times adopt varying norms and standards which may result in increased project costs. Also there are different methods used in projecting contingencies, price escalations and provision for maintenance expenditures in preparing capital cost estimates. As far as possible, the norms and standards specified by the Government of India must be followed.

4.2 Water Supply

4.2.1 Urban

In cities, the affluent sections of the population can afford and should, wherever possible, be provided with house connections. In urban fringe areas and for the economically weaker sections, standposts may be

provided at strategic locations. The water supply to uncovered towns should receive very high priority along with problem villages. The rehabilitation of urban water supply systems should also receive special consideration, since in many of the urban communities, the systems have deteriorated due to age and usage. In such cases this will call for small investments as compared to the investment required for new systems, and will substantially reduce maintenance and operation problems.

4.2.2 Rural

The rural population accounts for nearly 78 percent of the country's total population. There is a considerable backlog of projects for the provision of drinking water to the rural areas. The highest priority, therefore, will be given to the rural areas in the provision of water supply, particularly in regard to the problem villages. Special attention, must be given to hilly, desert and island areas, and to disadvantaged communities, such as the scheduled castes and tribes.

The pattern of coverage to be followed would provide 30 percent of the population with piped water supply and 70 percent through spot sources. In general, the water supply in rural areas will be from tube wells fitted with handpumps or power pumps.

Different approaches will be necessary due to problems of site location. In hilly areas preference has to be given to gravity systems, so as to reduce overdependence on power supplies and to minimise operation and maintenance costs. Wherever feasible, devices such as hydraulic rams could be employed for lifting water for small rural communities. In desert areas, there is the possibility that the only available water sources exist at depths greater than 150 metres. In such cases water supply will have to be arranged through tankers until alternative economical and feasible schemes are devised and implemented. In the island areas, the ground water quality may be impaired and may be unfit for human consumption, due to the intrusion of sea water. In such situations, it may be necessary to resort to various methods of desalination of sea water, with per capita demands reduced very substantially to lower levels because of high production costs. Also in areas where the water quality is affected by excess fluorides and other toxic substances, reduced per capita demands may have to be ordered.

4.3 Sanitation

4.3.1 Urban

In regard to urban sanitation, Class-I cities must be provided with sewerage and sewage treatment facilities. However, in the fringe areas of these cities, community toilets may have to be provided; moreover in areas where sewerage systems are not possible, low cost sanitation methods have to be adopted. The other urban areas, Class-II through Class-VI cities, will be provided with low cost sanitation facilities.

Low cost sanitation technology must be considered especially in rural/urban settings frequently referred to as urban, as sewerage systems are not economically feasible for the majority of communities in these areas.

4.3.2 Rural

In regard to rural sanitation, simple sanitary latrines will be used. Small per capita cash provision could be made as an incentive for the construction of sanitary latrines. Since such cash provision is not expected to meet the full cost of latrine construction, these payments are considered as subsidies only. In view of this, the mobilisation of local manpower under self-help programmes and the acquisition of materials for latrine construction will be required. Proper care should be exercised to see that water sources are not contaminated by latrines and that, wherever necessary, community latrines are provided with attendants.

4.4 Financial

4.4.1 Source of Funds

The financial resources required for implementation of water supply and sanitation programmes during the Decade, to enable India to reach its established targets by March 1991, will be made available from the States, Union Territories and Central Government's sector allocations of the Sixth, Seventh and Eighth Development Plans.

The funds for sector investment for the Sixth Development Plan have already been fixed and amount to slightly over four percent of the total outlay. These funds will be made available for all programmes of the first four years of the Decade or to the end of the Sixth Development Plan on 31 March 1985.

The resources expected to be available during the remaining period of the Decade, 1 April 1985 to 31 March 1991 will come from:

- related programmes of the Centre, States and Union Territories;
- funds generated by local bodies through optimum exercise of their existing powers;
- loans through the Life Insurance Corporation (LIC), Housing and Urban Development Corporation (HUDCO), and commercial banks; and
- external assistance from bi-lateral and multi-lateral agencies and organizations.

4.4.2 Development Plans

Due to the large financial requirements of the Decade, a higher priority has to be given to programmes under this sector. The plan provisions are to be stepped up in the future to provide adequate resources to achieve the targets of the Decade. The Development Plan outlays therefore, for the water supply and sanitation sector are to be increased from four percent in the Sixth Development Plan to a minimum of six percent of the total outlays of the Seventh and Eighth Development Plans.

4.4.3 Minimum Needs Programme (MNP)

Although rural water supply is getting a priority among the programmes listed under the Minimum Needs Programmes, yet it is necessary that rural sanitation alongwith rural water supply should be given the highest priority among these programmes and allocated not only the maximum but a much larger share of funds within the sector allocations for Minimum Needs.

Such larger allocations could be made during the remaining period of the Sixth Development Plan as well as in the Seventh and Eighth Plans.

4.4.4 State Government, Union Territories and Local Bodies

In providing for large and expanding urban and rural populations, resources must be found not only for capital investment, but also for maintenance and operational costs and depreciation charges. Since the programmes are implemented entirely within individual States and Union Territories, these Governments must take up effective and innovative measures for raising additional resources.

Local governmental bodies are hesitant to raise water rates, but they must be persuaded to accept the concept of selling water as a commercial commodity based on its cost of production and the management of the service. Reserve funds, in addition to current operational costs, must also be created for the renewal and replacement of the water supply schemes.

State and Union Territory Governments must establish water rates to ensure repayment of loans and interest, as well as the recovery of operation and maintenance costs, and provisions for building reserve funds. Surplus net revenues from water supply service for industrial and commercial purposes are to be utilised as subsidies for sewerage and rural water supply systems.

Active participation of urban local bodies is to be secured. Minimum contributions of 10 to 25 percent of capital costs are to be secured from such local bodies, depending on their size and their resources.

In the case of rural water supply schemes, the State and Union Territory Governments should stipulate minimum contributions by the people/ Gram Panchayats of at least 10 percent of systems costs. These contributions should be substantially raised in suitable cases depending upon the public's response and the resources of the Gram Panchayats concerned.

The State and Union Territory Governments should consider imposing a Special Purpose Cess as a surcharge on selected taxes, such as land revenue sales tax, passenger tax, motor vehicle tax, etc. All revenues received from such a cess should be utilised exclusively for water supply and sanitation schemes.

4.4.5 Life Insurance Corporation (LIC)

The Life Insurance Corporation provides loans upto a maximum of two-thirds of project costs, for the first one crore of the cost, 50 percent for the next one crore, 40 percent for the next three crores and 25 percent

of project costs in excess of five crores. Under this broad pattern of assistance, the LIC has made substantial funds available for the water supply and sanitation sector. Considering the magnitude of the Decade Programme, however, a substantial increase of 15 to 20 percent annually in the provision of funds from the LIC will be necessary for project financing.

The LIC should, therefore, be persuaded to earmark at least ten percent of their investible funds for the sector in comparison to their current practice of eight percent.

4.4.6 Other Avenues of Generating Sector Funds

4.4.6.1 Rural Development Fund

Expenditure directly incurred on approved Rural Development Programmes by companies and cooperative societies is eligible for full exemption from income tax. According to the latest policy decisions of the Government of India, it has been decided to set up a Rural Development Fund at the Central level and all contributions made to this Fund after April 1, 1983 by individuals, associations or corporate bodies will be entitled for cent per cent exemption from income tax. The Fund will be centrally administered and allocations made from it for carrying out schemes of rural development, including schemes for drinking water supply and sanitation. Since programmes of rural water supply and sanitation already enjoy a high priority in the Minimum Needs Programme and in the 20 Point Programme of the Prime Minister, a substantial and specified share of the Fund should be earmarked for these programmes and allocations made from it according to the needs of the various States as an additionality to their Development Plan outlays under the Central and the State Sectors.

To augment the Rural Development Fund industrial houses, philanthropic individuals, charitable trusts and other public spirited bodies should be persuaded and enthused to contribute generously to the Fund. If the donors indicate a preference for a particular category of schemes, such as those for drinking water supply, their wishes may be given due consideration in allocation of resources to the Sector programmes.

4.4.6.2 External Assistance

According to current practice, 70 percent of the external assistance received from the World Bank, other multi-lateral agencies and/or bilateral donors is passed on to the States and Union Territories as additionality to their plans. During the Decade Programme, this additionality should be earmarked specifically for water supply and sanitation projects, for which it is provided. This will ensure that such external assistance available for schemes under this sector is not diverted to other sectors.

The United Nations Agencies headed by the United Nations Development Programme have held several discussions with donor countries, who have expressed strong interest to assist member nations in achieving the targets established for water supply and sanitation in the Decade Programme. The provision and distribution of external assistance funds, as received by the Government of India is on the basis of approved projects only. There is no sector-wise earmarking or reserving of such funds on a general basis.

The State Governments and Union Territories must prepare a shelf of priority projects which can be proposed to external agencies for provision of credit assistance during the Decade Programme. Under these conditions, funds passed on to the States and Union Territories from external sources are to be used exclusively for the specified projects.

4.4.6.3 New Financing Institution for Sector Development

For the implementation of water supply and sanitation projects, credits or loans at present are available mainly from the State and Union Territory Governments and the LIC. In some projects, external assistance is available from the World Bank and bilateral donors, which is routed through the Central Government. Other financial institutions and commercial banks provide very little if any financial support for sector projects and no organized attempt has so far been made to explore this source of funds.

The effort in obtaining financial assistance is mainly left to local and/or State and Union Territory Governments, who have to promote support for individual projects. There is no established system nor central institution to coordinate, regulate, guide or monitor, the flow of financial services to the water supply and sanitation sector equal to those existing institutions that provide such services for agricultural development (ARDC), rural electrification (REC) and housing and urban development (HUDCO).

In order to streamline the institutional arrangements for financing of water supply and sewerage schemes, an institution must be established at the national level. The new institution must be empowered to raise loans from LIC, GIC, and other financial agencies and commercial banks, and to raise funds from the open market by issue of debentures. This institution would serve as a vehicle for the routing of funds from the Government of India, national agencies and external sources to the various organizations implementing water supply and sewerage schemes. The institution would help to coordinate financial arrangements and greatly facilitate the flow of funds and would bring about a greater measure of financial discipline and attention to economic viability of projects.

A national level financing institution needs to be established along the lines of HUDCO or REC to serve as the aforementioned central agency. The magnitude of the Decade Programme is of such scale that a separate national level institution would be fully justified.

5. SUPPORT PROGRAMME POLICIES

5.1 Administration and Management

The agencies responsible for planning and implementation of the Decade Programme are the public health engineering departments and water supply and sewerage boards in the States and Union Territories. Some States have separate organisations for urban and rural water supply and sanitation programmes. It would be desirable for one organisation at State and Union Territory levels to be responsible for all water supply and sanitation activities. This would bring about better implementation and control of the Decade Programme. At the Secretariat level, different departments handle urban and rural schemes or one department controls the public health engineering staffs and another the programmes. The staff working in water supply and sanitation are often split on rural, urban or municipal lines. It is necessary to have an integrated administrative framework from the programme planning and formulation stage to execution of schemes and technical guidance and support in operation and maintenance.

The administrative process in the Government must be streamlined and made flexible, keeping in view the importance of the Decade Programme. At present there is considerable delay due principally to inadequate delegation of powers to sanction schemes and incur expenditures for the purchase of material and equipment and for the appointment of staff. The purchase of materials is not well organized and often tied to different schedules of other departments. Delays in formal sanction of schemes result in escalation of costs and start up problems. Necessary changes must be introduced in the present system after thorough study has been made of the situation.

There are frequent transfers of senior officers who are in charge of water supply and sanitation activities in the State and Union Territory Governments. While transfers in some circumstances cannot be helped, it would be advisable not to transfer senior personnel too frequently in the interest of continuity and efficiency. It is suggested that, as far as possible, senior personnel should be allowed terms of at least three years in a post.

In many of the States, where water and sewerage boards exist, non-officials are often posted as Chairmen. To enable them to discharge their functions more efficiently, it will be desirable for them to participate in appropriate training courses and seminars. Similarly elected members in local bodies (municipal chairmen, village pradhan, etc.) should also be enrolled in such courses and seminars.

5.2 Manpower

The development of manpower is to be achieved basically in two ways, by improving the number and quality of trained persons at all levels and by recruiting categories of persons, where needed, who are in short supply for systems construction and for the operation and maintenance of the services.

5.2.1 Engineering Staff

The development of engineering personnel for the sector will require that:

- civil engineering curriculae be restructured to include elective courses in environmental engineering, and that graduates with such electives be given preference in recruitment for posts in the various Public Health Engineering Departments of State Government and Union Territories;
- diploma courses in civil engineering be remodeled to embrace environmental engineering subjects; and
- graduates be attracted to the sector, by improving service conditions, providing incentives of increased remuneration and benefits, opportunities and advancement and career development.

5.2.2 Technicians, Craftsmen and Skilled Workers

The personnel at grass root levels of public health engineering departments and water and sewerage boards are the technicians, craftsmen and skilled workers, who are employed in the execution of water supply and sanitation schemes, and in their operation and maintenance. These personnel should have detailed orientation towards water supply and sanitation during their course of basic studies, and should have opportunities of continuing education through in-service training to update and upgrade skills. State public health engineering departments should coordinate and develop courses to suit the needs of sector activities with existing industrial training institutes in the States.

5.2.3 In-house Expertise

In the planning and preparation of projects for the water supply and sanitation sector, there is a tendency to depend on outside or foreign consultants. It will be advisable to reduce such dependence and to develop instead project planning and preparation units in public health engineering departments and water and sewerage boards. Some of the expertise needed in the field of project appraisal, financial analysis and monitoring could be transferred from various industries and irrigation agencies, where these particular functions have been part of their project planning and preparation. Foreign technical assistance could still be used to develop training capability in state level institutions and local and foreign consultants could be retained for project preparation where this is proved to be the most feasible procedure.

5.2.4 In-service Training

It is very essential that present programmes of on-the-job training in public health engineering be continued with increasing intensity and emphasis during the Decade period. Planners, administrators, engineers, subordinate engineers, plant operators, laboratory personnel and community workers should undergo training with respect to their special needs.

5.3 Materials and Equipment

5.3.1 General

Sector materials and equipment necessary to meet Decade requirements are to be produced from indigenous or external sources, keeping in view, inter alia, existing capacities, increased production, new facilities and the Government's desire for the sector to remain self-sustaining by utilization of natural resources.

5.3.2 Specific Considerations

Specially and to the maximum extent possible, the sector will:

- use only indigenous raw materials in the manufacture of equipment and production of materials that will be required;

- import only that equipment or those materials that cannot be produced internally, are not existing within the country, or by reason of price, can be secured at less cost from external sources;
- urge the Government to reduce substantially or eliminate entirely import and/or excise duties now in effect or to be imposed on any equipment or material vital to this sector, which by reason of such duties and restrictions prohibit or prevent their utilization because of resulting higher product costs; and
- urge the Government through the Ministry of Energy, the Ministry of Petroleum, Chemical, and Fertilisers, the Ministry of Industry and the Ministry of Transportation to earmark or reserve at appropriate periods, in accordance with State Government and Union Territory Decade Plans, sufficient supplies in advance to meet the requirements of electric power, petrol, diesel and lubricating oils, cement, steel, pipes and vehicle wagon capacity and priority for the transportation of sector materials and equipment on the national railway system.

5.4 Operation and Maintenance

The operation and maintenance of water supply and sanitation systems is a specialised field and requires a high degree of responsible attention in order to conserve and prolong to the maximum extent, the useful service life of all facilities. The following aspects must be considered:

- adequate attention should be paid, during the planning and the design of systems to matters which will facilitate efficient operation and maintenance, such as, access roads, maintenance schedules, measuring devices, testing and communication facilities;
- preventive maintenance rather than corrective maintenance should be emphasised with proper supervision of all staff as one of the most vital and important functions;
- field staff should be properly qualified and experienced, and given status and authority;
- adequately trained operation and maintenance staffs should be assigned at the time of installation of the plants and equipment;
- provision should be made for appropriate maintenance depots, workshop stores, tools and equipment, spare parts, transport and communication facilities and training establishments for service personnel.

5.5 Research and Development of Appropriate Technology

In spite of the considerable research activity now on going in the water supply and sanitation sector, there have been communication gaps and research benefits have not filtered down to field engineers, who could fruitfully employ such research findings to better advantage. Research activities need orientation towards the development of appropriate technology in water supply and sanitation projects, utilising information available in developed and other developing countries and modified to suit local conditions, so that the cost of implementation could be minimised. A case in example is the programme of low cost sanitation project in collaboration with UNDP, which is an appropriate technology relevant to the country's needs.

Moreover, due to the absence of a Central coordination agency, there is insufficient collaboration among the institutions which undertake research activities, resulting in considerable overlap of efforts. It is necessary to establish a national body to overview and guide research activities. If necessary, established zonal centres could investigate the areas in which research work is needed and select programmes according to their importance and priority. Regarding the selection of subjects for research, State service departments are to be consulted to enable them to classify the selection as to priority. If possible, local bodies should be consulted, particularly in cases involving rural areas.

Laboratory model projects undertaken for research studies can be demonstration projects and operated jointly by service departments and research institutes. During such exercises, working and design manuals should be prepared and sent to all the service departments, laboratories and local bodies. In initiating demonstration projects, zonal centres should advise nearby states so that they may participate in these projects.

It is suggested that the Central Public Health Engineering and Environmental Organization in the Ministry of Works and Housing be appointed as the Central Coordinating Agency.

5.6 Management Information System

For sound planning, implementation, operation and maintenance of the water supply and sanitation projects an improved and effective management information system is to be introduced at the State and National level.

5.6.1 Information System/Data Bank

It is necessary to develop a data bank on the various schemes in water supply and sanitation undertaken by the States and Union Territories. The data is to be reported and compiled at the State levels and transmitted to the national data system maintained at and by the CPHEEO. Particular emphasis must be given on schemes of water supply to problem villages. The data must be organised in terms of geographical coverage, physical targets, costs for completion, people benefitted, levels of service and the overall achievements in physical and financial terms. These data are to be computerized with the help of the information centre for the purpose of storage and retrieval.

Many separate programmes can be accommodated at the central data bank once the system is operating and after base-line data has been prepared and stored. Conversion to the new system from manual data system will proceed at a pace commensurate with acquired expertise of the reporting units. The present M & I units, may be trained and sanctioned for this purpose and the information specialists in the CPHEEO should assist the State and Union Territory Governments to set up the system. Without the benefit of timely and adequate data concerning the schemes executed by the different agencies it will be difficult to adequately monitor the progress of Decade programmes.

5.6.2 Documentation

Documentation, one of the most vital and important steps in management information system design, is the physical record generally in written or printed form, describing the structure, operation and method for testing and revising the information system. Documentation provides description of the system from general to the fine detail. It will consist of the following data in regard to water supply and sanitation projects:

- summary flow charts of more detailed charts;
- operation activity sheets;
- specification of the data base or master files;
- hardware and software requirements, personnel requirements by type of skill and discipline;
- final (updated) performance specifications, cost of implementation and operation of the system;
- programme for modification or termination of the system; and
- an executive digest of the information system design, so that the top management can be advised regarding the system, its potential, its cost, and general configuration.

Documentation is necessary in respect of various reports and studies generated in the process of formulating various schemes, revaluations, internal control reports, consultancy studies, socio-economic studies, etc. This enables the exchange of experience and information for better performance. The CPHEEO should organise the international documentation unit for dissemination. Over a period, these data could be stored on microfilm.

5.6.3 Transfer of Technical Information

The technical cooperation among developing countries (TCDC) is very much essential to facilitate active implementation of decade programmes. The subject areas where TCDC is needed include information transfer, appropriate technology, programme development and formulation, experience in financial aspects and other policies, standardisation of design criteria and legislation on water supply and sanitation.

The information available on common problems in the region or States could be usefully gathered and disseminated to all concerned. Similarly liaison with countries in other regions may be required on subjects such as ground water recharge as practiced in some South American countries, package programmes for community water supply and sanitation adopted in South-Korea and desalination technology using solar energy in the Carribean Islands, to list only a few of the many examples of appropriate technology. Such transfer of technology would indeed prove beneficial. The CPHEEO at the Centre, through its international documentation unit, when operational, would transfer the information as required.

5.7 Coordination with Other Sectors

5.7.1 General

There are many activities in the various Ministries and Departments of the States and Central Government, which have a direct or indirect bearing on the water supply and sanitation sector. The dovetailing of these activities will maximise the inputs and strengthen the sector.

5.7.2 Irrigation Programmes

Under the major and medium irrigation projects, reservoirs, canal systems and tubewells are being constructed. All sources can quite easily supply village drinking water requirements in addition to fulfilling their main irrigation purposes. In such cases the supply of drinking water will be assured at all times including drought periods. The villages near embankments of major and medium irrigation projects and those situated on the banks of irrigation canals should be provided with drinking water supply from such schemes free of cost, as far as possible, and many water supply schemes can well be integrated as parts of irrigation projects. Thus maximising the utilisation of financial resources of the sector. Therefore, where the requirements of water supply schemes are small, water should be provided by irrigation tubewells and where feasible, should also be stored in sumps and distributed at the desired pressures. Since drinking water supply needs are small compared to irrigation demands some portion of the irrigation water should be allocated to water supply departments. Where the costs of such schemes are not substantial, they could be constructed by Irrigation Departments with their own funds and given to the village communities for operation and maintenance. In large urban projects, charges for water supply for drinking purposes from irrigation projects should not exceed the rates at which water is supplied for irrigation. The State Governments should advise their Irrigation Departments to integrate drinking water supply schemes and set apart a portion of the water for drinking purposes as a part of irrigation projects in all possible areas.

5.7.3 Public Agencies

Agencies like the railways and public sector corporations, are constructing water supply schemes for their colonies. Various industrial development corporations as well are also providing water supply and sewerage for their areas. These activities and the sector activities of public sector townships constitute an additionality to the Decade Programme and should be integrated and coordinated with the sector programmes of their respective State Governments and Union Territories.

5.7.4 Ministry of Rural Development

The National Rural Employment Programme of the Ministry of Rural Development is basically geared to provide employment in the rural areas and in the process to create durable community assets through utilisation of provisions for the labour component of the project. Through these same provisions, rural water supply and sanitation schemes can be implemented.

Although at present there is no earmarking of funds under this Programme for drinking water supply schemes or sanitation schemes, the State Governments and Union Territories are at liberty to select any of the works mentioned in the guidelines for implementation of projects under this Scheme, including drinking water supply and sanitation. If necessary the guidelines could be suitably amended. Community participation should also be secured for systems maintenance arrangements through the Block Development Administration and through the Panchayat Samities (Village Councils).

5.7.5 Ground Water Boards

Central and State Ground Water Boards play an important role in identification of needed raw water sources that must comply with quantity and quality specifications of water supplies. The Public Health Engineering Departments of the States and Union Territories should enlist the personnel and coordinate the services of these Boards. Since, adequate numbers of senior hydrogeologists and geophysicists are not available in the States and Union Territories, senior personnel from the Central Ground Water Board should take up the work of site location and the scientific prospecting of ground water. Gradually, the States and Union Territories and their Ground Water Boards can develop their own cadre of hydrogeological staff.

5.7.6 Ministry of Health and Family Welfare

In providing basic health care services, it is essential to establish training programmes for all levels of health personnel, in regard to the important aspects of safe water supply and adequate sanitation. It is important in turn to educate the public with regard to these aspects through the facilities and services of Primary Health Care Centres, Block Development Offices and Community Health Volunteers.

The Ministry has formulated targets for training and employment of health personnel and the establishment of health facilities which are necessary to provide primary health care to the people under the programme of 'Health for All' by the year 2000 AD.

The Ministry has already trained over 170,000 health guides to impart health education among the rural people and there is a proposal to train at least one health guide for every village by the end of the Sixth Development Plan. These health guides possess the necessary training to educate the rural masses in the proper maintenance of drinking water supplies from source to use. They are also equipped to motivate the community and initiate action in the conversion of open wells into sanitary ones, and use of water seal toilets followed by septic tanks and soak-pits for sanitary disposal of human

wastes. The Ministry through the Primary Health Care Centres will act as the liaison and coordinating agency in the execution of education campaigns in the required rural areas.

5.8 Health Education/Community Participation

In the implementation of the Decade Programme, support programmes like 'Health Education' and 'Community Participation' will have to play crucial roles. It is a known fact that without proper education, there will be little impact on community health despite huge investments on water supply and sanitation facilities. Health education and community participation will be carried out by the Primary Health Care Centres, Block Coordination Committees and trained health workers and community health volunteers.

5.8.1 Health Education in the School

As a part of the Primary Health Care Programme the following objectives would be pursued:

- teachers trained to recognise defects and ailments in children at an early stage;
- school authorities advised as regards safe water, sanitary latrines; and
- health education programmes arranged involving the children, teachers and parents.

5.8.2 Health Education in the Community

Trained community health volunteers would be working with the panchayat personnel and community leaders in planning for:

- selection of community representatives for training in maintenance and repair of hand-pumps and construction of sanitary latrines and soak-pits; and
- health education programmes; and campaigns for safe water supply and environmental sanitation.

Health education programmes in the community by health workers and community health volunteers should lay greater stress on the following needs:

- safe water supplies and proper chlorination;
- maintenance of wells and hand-pumps by the community, and to prevent contamination of water sources by bathing and washing of clothes, etc.;
- prevent accumulation of sullage water around dwellings; and to dispose of refuse in an hygienic manner; and

- construct and use sanitary latrines and to maintain them properly.

Mass media such as radio, television, films and papers will augment the efforts in this direction.

5.8.3 Block Coordination Committees

Action programmes of health education and community participation can be effectively executed by Block Coordination Committees whose principal functions, among other activities, would be to:

- organise cleanliness campaigns;
- arrange for the community to procure at reasonable prices, materials for the construction of latrines and soakpits; and
- arrange for the training of community members in the maintenance and repair of hand-pumps and construction of sanitary latrines and soakpits.

5.9 Non-Governmental Organizations (NGOs)

Non-governmental Organizations play a significant role in enlisting community participation and in developing skills and activities which complement the implementation of government programmes. This complementarity can be enhanced by providing means and mechanisms for a larger Non-governmental Organization participation.

5.9.1 Non-Governmental Organization Capability

A recent survey by the UNDP of a sample group of 14 NGOs representing a significant cross-section of these agencies in the country found that:

- several had developed complete capabilities in the provision of drinking water and sanitation in urban and/or rural areas;
- most had attempted community involvement and several had successfully developed people's unions and organizations (Sangams, Sangathans etc.) for the promotion of activities in their areas;
- they had experimented with and innovated appropriate low cost technologies in drinking water and sanitation facilities;
- all had experience of working with government departments and agencies and many were represented on different committees of the State and Central Government;
- most emphasized that maintenance of drinking water and sanitation facilities should be an on-going responsibility of the local community, although the training of local persons and provision of necessary minimum spares are critical for this to succeed;

- greater dissemination of information was necessary regarding the Decade and other government plans and programmes to enable more effective collaboration with government agencies in achieving national goals; and
- providing printed educational materials was necessary on drinking water and sanitation for motivating and educating the community as well as field level workers.

5.9.2 Non-Governmental Organization Involvement

To ensure a greater involvement of the NGOs in sector programmes, it is necessary for them to be adequately represented both at the State and Central Government levels. Further, a committee of NGO representatives must be formed, which should:

- prepare a resource profile of all NGOs for the information of the Central and State Governments indicating the nature of their activities;
- periodically review and monitor the implementation of the Decade Programme in areas of NGOs collaboration;
- identify the manner and type of NGOs involvement;
- promote community participation;
- assist in the development and supply of educational materials for educating communities and project staffs in the local areas;
- identify areas of research and make social-economic assessment of programme needs;
- involve women's organizations as educators and motivators of community households especially women and children, and
- establish implementation/coordination committees at State/District levels, which should include women representatives as well as elected representatives and government officials.

5.9.3 Government Recognition and Support

To enlist the support of the Non-governmental Organizations in the area the Central government should:

- provide appropriate recognition of NGOs as training resources, both at the national and state levels;
- involve NGOs in producing training materials, integrating health educational materials with other sectoral materials, etc.; and
- assist in the provision of visual aid equipment for utilising above materials.

As some NGOs are already cooperating with government at State and local levels in training and materials development and use, certain model experiences and examples of such cooperation should be replicated elsewhere in the country. These pilot projects should be part of a strategy to expand the effectiveness of water supply and sanitation efforts in the country.

6. DECADE PROGRAMME PRIORITIES

6.1 Priority Areas for Implementation

The following priorities should be adhered to by all State Governments and Union Territories in drawing up and implementing the Decade Programme:-

- i) safe drinking water to problem villages;
- ii) safe drinking water to uncovered towns or uncovered urban areas;
- iii) rehabilitation of old urban water supply schemes;
- iv) low cost sanitation to towns other than Class I cities;
- v) safe water supply to non-problem villages;
- vi) augmentation of urban water supply systems;
- vii) sewerage facilities to Class I cities lacking them at present; and
- viii) sanitation in rural areas.

6.1.1 Special Priority Considerations for Water Supply

The 231,000 problem villages is the planned target coverage under the State Sector Minimum Needs Programme and the Central Sector Accelerated Rural Water Supply Programme during the Sixth Development Plan.

In the implementation of the rural water supply programme, the needs of the scheduled castes and scheduled tribes must be given high priority. Every new source of drinking water in a village should be located in the scheduled castes habitation, open to all communities, where it is logistically and technically possible to do so.

The following guidelines must be followed in the implementation of all rural water supply schemes, in view of the limited resources available:

- first priority must be accorded to no-source villages which have remained so far without water supply facilities;

- all villages which have sanitary dugwells as existing sources of water supply must be identified and deleted from the list of problem villages already sent by the State Governments. Moreover, problem villages that have been provided with permanent safe water supply facilities under the advance plan assistance programme for natural calamities, must also be deleted from the list. In the remaining problem villages, first priority must be accorded to villages with no sources of supply. At least one source of potable water must be available throughout the year in every problem village;
- where the population of villages is more than 300, additional sources should be provided on the basis of one source per 250/300 inhabitants. New sources of supply should be provided preferably in harijan bustees;
- for hard rock areas, tubewells with handpumps must be the first preference. Piped water supply schemes might be necessary in places where water is brackish or source of water is at a distance. However, piped water supply schemes or power pumps should be the last alternative;
- suitable engineering solutions must be worked out and most economical alternatives adopted in hilly areas, deserts and other strategic places;
- in hilly areas, gravity flow systems or devices like hydraulic rams can be considered as economic alternatives; and
- augmentation of rural water supply schemes should be avoided at least until all unserved villages are covered.

6.1.2 Special Priority Considerations for Sanitation

In urban sanitation, only the Class I cities are to be provided with complete sewerage systems. Even in these cities community toilets and public latrines with attendants will have to be provided to meet particular needs and circumstances. For other classes of towns, only low-cost sanitation techniques are to be considered as viable solutions.

Low cost sanitation techniques would provide flush toilets by:

- converting all dry latrines feasible into sanitary latrines;
- providing pourflush latrines with leach pits to individual households, wherever feasible; and
- providing well maintained community latrines, with full time attendants for households which cannot be covered under either of the above, due to space limitations.

The towns are to be selected based on the criteria that they:

- already have piped water supply systems;
- are not sewered and are not likely to be sewered during the decade;
- have populations less than 100,000;
- represent varied socio-economic, cultural and geophysical conditions; and
- are interested and financially viable, so that the schemes can be implemented expeditiously.

In rural sanitation, 25 percent of the population are to be provided with simple sanitary latrines. The Government should give a cash subsidy on a per capita basis, as an incentive to the beneficiaries under the programme of low cost sanitation.

6.2 Phasing of Decade Programme

The Decade Programme is divided into two Phases; Phase I covering the remaining four years of the Sixth Development Plan, 1981/82 to 1984/85; and Phase II the remaining six years of the Decade, 1985/86 to 1990/91.

6.2.1 Phase I

In Phase I, the estimated populations¹ that can be served with the available resources provided in the Sixth Development Plan will approach 87 percent in urban water supply and 52 percent in rural water supply; in sanitation, service will be provided to approximately 34 percent in the urban area and 1.5 percent in the rural communities.

6.2.2 Phase II

In Phase II, service will be provided to the remaining unserved population in both urban and rural water supply, and facilities provided in sanitation to the urban and rural areas sufficient to reach the Decade targets of 80 and 25 percent, respectively.

¹The percentage of population is based on the projected population for 1985.

7. DECADE PROGRAMME FUNDING

7.1 Programme Fund Requirements

The total requirement of funds projected by the States and Union Territories for the implementation of the Decade Programme is estimated at Rs. 14,700 crores based on 1980 price level; to cover the target population by 31 March 1991. It should be noted that price changes and other contingencies pertinent to the Decade Programme must be taken into account when annual allocation in Development Plans are made. Sectorwise, the figures are shown in Table C as follows:

Table C

Decade Programme Fund Requirements		
Sector Category	Rs.	US \$
Urban Water Supply	3,150	4,039
Rural Water Supply	6,525	8,365
Urban Sanitation	3,745	4,801
Rural Sanitation	747	958
Operation & Maintenance ¹	533	683
Total Estimated Cost	14,700	18,846
Rupees in crores; US \$ in millions. 1980 prices Exchange Rate/1980: 1 US \$ = 7.8 Rupees		

The estimated capital cost of the Decade Programme by State and Union Territory is shown in Table 3, Appendix I.

7.2 Sources of Programme Funds

7.2.1 Phase I

The Government of India has allocated Rs.3,908 crores to the water supply and sanitation sector in the Sixth Development Plan, which is 4.01 percent of the total Sixth Development Plan outlay

¹ Strengthening of operation & maintenance.

and 6.58 percent of the States and Union Territories sector outlay. Details of sector fund allocation of the Sixth Development Plan are shown as follows in Table D.

Table D

Phase I Allocation of Funds		
Category	Sixth Development Plan	
	Rs.	US \$
<u>State/UT Sector Outlay</u>		
Urban Water Supply and Sanitation	1,753.56	2,248.15
Rural Water Supply (MNP)	1,407.11	1,803.98
Rural Water Supply Other than MNP	127.89	163.96
Rural Sanitation	19.24	24.67
Total State/Union Territory	3,307.80	4,240.76
<u>Central Sector Outlay</u>		
Accelerated Rural Water Supply Programme (ARP)	600.00	769.24
Total Allocation	3,907.80	5,010.00
Expenditures in 1980/81	524.20	672.05
Total Allocation Available Phase I	3,383.60	4,337.95
Rupees in crores; US \$ in million. 1980 prices Exchange Rate/1980: 1 US \$ = 7.8 Rupees		

The balance in rounded amounts of the allocated sector funds in the Sixth Development Plan available to meet the requirements of Phase I of the Decade Programme is Rs. 3,384 crores, equivalent to US \$ 4,338 million, and is slightly over 23 percent of the total Decade Programme Fund requirements.

7.2.2 Phase II

The funds available for Phase II are to be provided from the full five year period of the Seventh and the first year of the Eighth Development Plans together with various other sources. This amounts to Rs. 11,316 crores, the difference between the total Decade Programme of Rs. 14,700 crores and expenditures in 1980/81 and Phase I requirements.

Details of Phase II fund requirements are shown as follows in Table E:

Table E

Phase II Allocation of Funds						
	1	2	3	4	Phase II	
	Rs.	Rs.	Rs.	Rs.	Rs.	US \$
Urban Total	6,895	1,754	182	1,572	5,323	6,825
Water Supply	3,150	1,754				
Sanitation	3,745					
Rural Total	7,272	2,154	342	1,812	5,460	7,000
Water Supply	6,525	1,426				
Sanitation	747	600				
Other		128				
O & M	533				533	683
Total	14,700	3,908	524	3,384	11,316	14,508
Col. 1: Decade Programme Fund Requirements, 1981-1991 Col. 2: Sector Allocation of Funds, Sixth Development Plan, 1980-85 Col. 3: Expenditures 1980/81 in Sixth Development Plan Col. 4: Phase I Funds Available Rupees in crores; US \$ in million. 1980 prices Exchange Rate/1980: 1 US \$ = 7.8 Rupees						

7.2.3 Total Fund Requirements

A summary of the total investment required to implement Phase I and Phase II of the Decade Programme is shown as follows in Table F:

Table F

Summary of Decade Programme Fund Requirements						
	Phase I		Phase II		Total Decade	
	Rs.	US \$	Rs.	US \$	Rs.	US \$
Urban						
WS & S	1,572	2,015	5,323	6,825	6,895	8,840
Rural						
WS & S	1,812	2,323	5,460	7,000	7,272	9,323
O & M			533	683	533	683
Total	3,384	4,338	11,316	14,508	14,700	18,846
Rupees in crores; US \$ in million. 1980 prices Exchange Rate/1980: 1 US \$ = 7.8 Rupees						

The proposed sources of funds for the Decade Programme are to be provided as shown in Table G. The estimated annual yield that may be expected from a Special Purpose Cess is shown in Table 5, Appendix I. The various State and Union Territory agencies and the Central Sector and local bodies that contribute to sector investment is shown in Table 6, Appendix I.

The State Governments and Union Territories should allocate additional resources, wherever possible, to the Decade Programme, especially to Phase II, since funds for Phase I are already locked in by the sector allocation in the Sixth Development Plan. Phase I average annual investment will approach Rs. 850 crores, while average annual investment in Phase II will be over twice that of Phase I at Rs. 1,890 crores. To ensure the most effective utilization of investment resources, the progress of the Decade Programme should be regularly and frequently monitored by the State and Union Territory Apex or Action Committees.

Table G

Sources of Funds		
Source	Amount of Funds	
	Rs.	US \$
<u>Phase I (Actual)</u>		
Sixth Development Plan	3,384	4,338
<u>Phase II (Estimate)</u>		
Seventh Development Plan*	9,000	11,539
Eighth Development Plan*	2,000	2,564
Special Purpose Cess**	1,391	1,784
Total Funds Available	15,775	20,225
Total Funds Required	14,700	18,846
<p>*The provision has been quantified on the basis that (i) the plan size will increase and (ii) that a minimum of 6% of the total plan outlays will be provided for water supply and sanitation sector, and includes additional funds available from LIC</p> <p>**Table 5, Appendix I, Phase II 6 yrs x 231.6 = 1391</p>		
<p>Rupees in crores; US \$ in million. 1980 prices Exchange Rate/1980: 1 US \$ = 7.8 Rupees</p>		

8. MANPOWER

8.1 Present Status and Future Requirements

An inventory has been made of the manpower position in the sector as of 31 March 1981, by the Ministry of Works and Housing (CPHEEO) on the basis of data furnished by the States and Union Territories. They have projected their manpower requirements for Phase I and Phase II of the Decade programme. Table H presents the manpower position and future requirements on a country-wide basis.

Table H

Manpower Category	Number in Position 1981	Number in Position End of Sixth Plan 1985 Phase I	Number in Position End of Decade 1991 Phase II	Additional Number To Be Recruited During	
				Phase I	Phase II
Engineers (Degree)	9,775	18,850	28,675	9,075	9,825
Engineers (Diploma)	15,755	30,745	52,775	14,990	22,030
Other Professionals ¹	1,435	3,310	5,090	1,875	1,780
Technicians ²	29,195	66,695	125,255	37,500	60,560
<p>1 Economist/Financial Analyst, Accountants, Social Scientists/Health Educators, Sanitary Chemists/Biologists and Hydrogeologists/Geologists</p> <p>2 Draughtsman, Plant Operators, Mechanics/Electricians, Plumbers, Drillers and Laboratory Technicians.</p> <p>All figures rounded to the nearest five.</p>					

A breakdown on a country-wide basis of professional and technical staff is shown in Table 7, Appendix I, and the total manpower position, as of 31 March 1981, and future requirements, on a State and Union Territory basis, in Tables 8-14, inclusive, Appendix I.

8.2 Assessment in Relation to the Requirements of Phase I and II

8.2.1 Professional Engineers

At present, there are about 9,800 graduate engineers and 15,800 diploma engineers working in the sector. These professionals range from senior level engineers to subordinate engineers, who are involved in planning, investigation, design, construction and operation and maintenance of water supply and sanitation schemes.

By the end of the Sixth Development Plan or Phase I of the Decade Programme, approximately 18,900 graduate engineers and 28,700 diploma engineers will be required in the sector. The additional

number of graduate engineers and diploma engineers required in the next four years will be about 9,100 and 15,000, respectively, nearly double the number of engineers at present. Similarly, the requirement by the end of Decade or Phase II would be some 28,700 and 52,800 in respect of graduate and diploma engineers. Thus, some 18,900 graduate engineers and 37,020 diploma engineers would be needed by the sector, in order to meet the Decade requirements. This will call for the recruitment into sector work during Phase I of an additional 24,065 engineers, 9,075 graduate and 14,990 diploma engineers and during Phase II of 31,855 engineers, 9,825 graduate and 22,030 diploma engineers.

Table I shows the annual (average) recruitment of engineers into the sector that must take place in accordance with the requirements as determined by the States and Union Territories.

Table I

Requirements of Sector Recruitment		
Discipline	Annual Average	
	Phase I	Phase II
Graduate Engineers	2,270	1,640
Diploma Engineers	3,750	3,670

8.2.2 Engineering Education Institutions

The problem of educating and recruiting the required number of engineers for the sector is severe and taxing, and will demand a high degree of dedication on all sector executing agencies, as well as on the many educational institutions and their teaching staffs. There must be effective collaboration between sector organizations and educational institutions in pursuit of mutual objectives.

Table J provides information on the educational institutions offering degree and diploma courses in civil engineering, and data concerning intake capacity and graduates, as of 1979. The data is on a regional basis. These data are further detailed in Tables 15 - 17 inclusive, Appendix I.

In an analysis of the institutional capacity to produce the required number of engineers, using as a basis the aforementioned data, it becomes apparent that almost one-half (49%) of degree graduates and over one-third (40%) of the diploma graduates would have to be recruited for sector work to satisfy Phase I professional

Table J

Location and Number of Institutions	Present Intake (number)	Graduated	
		(number)	(present)
Degree			
Northern Region (19)	1,009	798	79
Eastern Region (17)	823	603	73
Western Region (24)	1,788	1,488	83
Southern Region (42)	3,567	1,766	50
All Regions (102)	7,187	4,655	65
Diploma			
Northern Region (57)	3,352	2,232	67
Eastern Region (41)	2,520	1,440	57
Western Region (54)	3,805	3,100	82
Southern Region (82)	4,009	2,326	58
Polytechnics (Women)	222	136	62
All Regions (234)	13,908	9,234	67

engineer requirements. This is not likely to be realised, since it is highly probable that only small numbers of these graduates specialized in fields allied with the sector, such as sanitary, public health or environmental engineering.

Under the assumption that the number of existing educational facilities will remain unchanged, the sector must acquire its necessary engineering manpower components for Phase I and II through combinations of an increased number of intakes, higher percentage of graduates in sector disciplines and an increased percentage of those graduates entering the sector. The sector agencies and its authorities may not be able to influence greatly the first two items, but they have the opportunity

to assist in achieving the last item by putting into practice the Government's policies on manpower, particularly those elaborated on earlier in this document.

In most of Engineering Colleges there is no Public Health Engineering Special Section at graduate level. The Public Health Engineering Curriculae Committee had suggested for inclusion of a public health engineering discipline at graduate level. For the implementation of the Decade Programme it will be beneficial if the universities are prevailed upon by the Central and State Governments for introduction of public health engineering subjects as optional at the final year stage, so that at least some new graduates will be available for recruitment with specialisation in public health engineering.

8.2.3 Sector Recruitment Options

Table K provides estimates of the percentage of degree and diploma engineer graduates that must be recruited to the sector annually in order to meet the engineering manpower requirements of both phases of the Decade Programme:

Table K

Percent Graduates of Intakes	Percent Graduates to be Recruited Annually to Sector to Meet Requirements		
	Phase I	Phase II	Over Decade
Engineer			
Degree			
100	30	26	28
90	34	29	31
75	40	35	37
65 ¹	45	40	43
Diploma			
100	25	32	29
90	28	35	32
75	34	42	39
67 ¹	38	47	43
¹ 1979 Baseline Data: Weighted average percent Graduates of Intakes; all regions, all institutions.			

These figures emphasize that sector recruitment will have to be in the neighbourhood of 30 to 40 percent of the annual graduates of all the institutions with the corresponding improvements in percent graduates of intakes to meet both Phase I and II requirements. It should also be noted that in the event percent graduates of intakes remains at the levels of 65 and 67 percent in degree and diploma graduates, the chances of sector recruitment reaching annual levels of 40 to almost 50 percent are remote, and the sector would have to operate with a shortfall in engineering manpower.

8.2.4 Other Professional Personnel

In the case of other professional personnel, such as economists/ financial analysts/health educators, the requirement by the end of Phase I and Phase II appears to be more than double and triple of that presently available. These personnel will have to be drawn from the field of general disciplines and trained for specific tasks as may be required in the Decade Programme.

8.2.5 Technicians, Craftsmen and Skilled Workers

Generally the technicians, craftsmen and skilled workers required for manning the Decade Programme have been classified as draughtsmen, plant operators, mechanics, electricians, fitters, plumbers, drillers and laboratory technicians. These personnel are mostly qualified from Industrial Training Institutes (ITI) in the respective trades. However, some of the trades may not be available in the existing institutes.

There are 466 such institutes, of which some are provisionally affiliated and some are permanently affiliated to provide training in the engineering trades. The duration of the engineering trade course is either one year or two years according to the type of the trade. The qualification for admission to these trades is two standards below higher secondary. After completion of the course, the candidates are awarded National Trade Certificates, if they qualify at the final All India Trade Test. In the aforesaid programme, the training is given free of cost. It has been recently recommended that 50 percent of the candidates are to be given Rs. 40. per month as a stipend. The stipend is also given during their apprenticeship.

It is estimated that the additional requirements for personnel in these categories to meet the needs at the end of Phase I and Phase II would be over 38,000 and 60,000, respectively. This type of personnel will by the end of Phase I be more than double and by the end of Phase II more than four times the present level. The demand for plant operators will be very large and may account for more than one-third. Thus, it is estimated that, on an average, about 10,000 skilled workers would be needed annually during the Decade period. This can be met only if at least 20 of the students passing out from each of the 466 Industrial Training Institutes join public health engineering departments every year.

8.3 In-service training

Public health engineering being a field of specialization requires constant and continual training of its personnel to improve professional skills. To effectively accomplish this task, on-the-job training must be continued with increasing intensity and emphasis during the Decade. The programme is to be tailored to the needs of:

- planners and administrators to provide more awareness of service and health benefits, capital and operating costs of water supply and sanitation projects and long range implications of technologies, so that sector project investment can be more effectively programmed;
- engineers to update technical information on planning, design, construction, and on operation and maintenance of water supply and sanitation projects, and in addition orientation in systems analysis, least cost solutions and appropriate application of low cost technology; and
- subordinate engineers, plant operators, laboratory personnel and community workers to undertake necessary field work, oversee operation and maintenance and organize communities.

The requirements of these training programmes can be met in the following manner:

- Training at undergraduate level;
- Training at post graduate level;
- Short term courses; and
- Public Health Engineering Training Programme under the Ministry of Works and Housing.

9. MATERIALS AND EQUIPMENT

9.1 General

The bulk of the capital investment in the water supply and sanitation sector is directed toward the procurement of proprietary materials and equipment and in the availability and sufficiency of the important services of the transportation and energy sectors. The total requirement of materials and equipment during the Decade will increase substantially, in fact many times, over the requirements of past years. While there may be adequate installed capacity for the manufacture and production of these sector materials many plants are working far below their installed capacities, due mainly to the lack of sufficient fuel, power, raw materials and vehicles for transportation of the raw materials and finished products. Of the materials and equipment required for the sector, pipe and cement will represent a large portion of the capital

investment. Shortages of these two items especially, as well as shortage in some raw materials and equipment are expected.

9.2 Requirements and Assessment

An assessment has been made by the States, Union Territories and the Central Government in the determination of the sector's material and equipment requirements to meet the needs of both Phase I and Phase II of the Decade Programme and, wherever possible, an evaluation of the capabilities of the manufacturing, industrial, transportation and energy sectors to provide them.

9.2.1 Pipe

9.2.1.1 Application

In sector work, pipe for water supply and sanitation systems represents a large portion of the capital investment required in their implementation and are of particular importance. The main pipe materials which find application in sector work are shown in Table L:-

Table L

Type of pipe	Field of application	Manufactured by
Plastic (PVC/High Density Polyethylene)	Rural and urban water supply and sanitation	Organized Sector and small scale sector
Asbestos Cement	Rural and urban water supply	Organized sector
Galvanised iron	Rural and urban water supply	Organized sector
Stoneware	Rural water supply and urban sanitation	Small scale sector
Cast Iron	Rural and urban water supply and urban sanitation	Mainly organized sector
RCC/PSC/Cylinders	Urban water supply and sanitation	Mainly small scale sector
Steel	Urban water supply	Organized sector

9.2.1.2 Sector Requirements

The pipe requirements for Phases I and II of the Decade are given in Table M. Additional details on each of the eight classifications of pipe by size and quantity for the Decade Programme are provided in Table 18, Appendix I.

Table M

Type of Pipe	Decade Programme Pipe Requirement During		
	Phase I	Phase II	Decade
	Km 000's		
Plastic (PVC) (HDPE)	78.99	184.32	263.31
Asbestos Cement (AC)	66.53	155.22	221.75
Galvanized Iron (GI)	45.27	105.63	150.90
Stoneware	34.09	79.55	133.64
Cast Iron (CI)	24.87	58.03	82.90
Reinforced Concrete(RCC)	13.91	32.45	46.36
Steel	2.87	6.70	9.57
Pre-stressed Concrete (PSC)	0.82	1.91	2.73
Total	267.35	623.81	891.16

Of the eight types of pipe shown, Decade requirements call for the extensive use of plastic (PVC), asbestos cement (AC), galvanized iron (GI), stoneware and cast iron (CI) pipe in that order. These five types represent almost 95 percent of the Decade demand and four of the five are used to a major extent in rural and urban water supplies, with stoneware pipe used mainly in sanitation projects.

9.2.1.3 Production and Availability

With respect to availability and the national capacity to produce in sufficient quantity to fulfill sector needs, severe problems exist in the provision of galvanized iron (GI) and cast iron (CI) pipe as to the production facilities or installed capacity, and somewhat less seriously to the lack of adequate supplies of raw materials in these pipe types, as well as in plastic (PVC) and asbestos cement (AC) pipe.

Stoneware pipe and the remaining reinforced concrete (RCC), steel and pre-stressed concrete (PSC) pipe all have adequate availability and production capacity to satisfy the demands.

Table N provides estimates of pipe production against Decade Programme requirements in the four pipe classifications requiring the largest demands, over 80 percent of the total, and which have production problems.

Table N

Type of Pipe	Demand and Production						Remarks
	Phase I		Phase II		Decade		
	D	P	D	P	D	P	
Plastic	110	1,070	250	1,600	360	2,670	IC adequate, shortage in indigenous resin and HDPE
AC	745	1,150	1,730	2,785	2,475	3,935	IC adequate, shortage in cement and asbestos fibres
GI	1,585	300	3,700	450	5,285	750	IC inadequate, shortage of raw materials (pig iron)
CI	2,285	750	5,255	1,120	7,510	1,870	IC inadequate, shortage of raw materials (pig iron, coke, ferro-silicon)
D: Demand metric tonnes 000's P: Production in metric tonnes 000's IC: Installed capacity							

9.2.2 Cement

The scarcity of cement for the implementation of water supply and sanitation projects in the country is one of the major constraints affecting the water supply and sanitation sector.

The requirement of cement during the Decade for the sector is approximately 13.4 million tonnes. The requirement during Phase I of 3.25 million tonnes, includes 1.75 million tonnes for rural water supply and 1.50 million tonnes for urban water supply and urban and rural sanitation.

9.2.2.1 Sector Demand

Table 0 shows the sector demand for cement during Phases I and II, and by year in Phase I for rural and urban water supply and sanitation.

Table 0

Sector Demand (metric tonnes, million)			
	RWS	UWS & S RS	Total
<u>Phase I</u>			
1981 - 82	0.33	0.28	0.61
1982 - 83	0.37	0.31	0.68
1983 - 84	0.41	0.35	0.76
1984 - 85	0.65	0.55	1.20
Total	1.76	1.49	3.25
<u>Phase II</u>			
1986 - 91	-	-	10.13
Total Decade	-	-	13.38

9.2.2.2 National Demand and Production

The installed capacity of the cement plants in the country as on 1 April 1980 was 24.29 million tonnes. With a view to creating additional capacity in the cement industry, the Government of India had approved by way of grant of letters of intent/industrial licences for 31 million tonnes, as on 1 April 1981. The Planning Commission in their report had made a forecast of demand of cement and also the likely build up of cement capacity during Phase I.

It is estimated that during Phase I a capacity of 22.69 million tonnes is expected to be added to the existing capacity of 24.29 million tonnes that was in place on 1 April 1980.

At present, in view of the scarcity of cement that is prevalent in most of the states and their need to deal with the situation under normal rules, the State Governments and Union Territories have been advised by concerned authorities to strengthen administrative measures and take over the distribution of cement under their own direction. The Government of India is already involved with the problem of availability of scarce materials in the country and has taken all possible steps to ensure the availability of cement to the Core Sector. If indigenous production of cement is not sufficient to meet the demand, advance planning for the import of cement should be made to meet the requirements of the water supply and sanitation sector. The allocation of cement to the State Governments for this sector during the Decade Programme should be given the same priority as is given to the programmes under the Core Sector. The Ministry of Industry, DGS&D and the Cement Controller, Government of India have been requested to take appropriate action for making available the required cement for sector needs.

Table P shows sector and national demands, expected capacities, production and shortfalls in Phases I and II of the Decade Programme. Phase II estimates have been projected based on assumptions in the table footnotes.

Table P

Demand and Production (metric tonnes, millions)					
	Sector Demand	Country ¹ Demand	Likely Capacity	Expected Production	Shortfall Demand vs Production
<u>Phase I</u>					
1981 - 82	0.61	30.22	31.18	25.23	4.99
1982 - 83	0.68	32.64	36.49	28.98	3.66
1983 - 84	0.76	35.28	41.04	32.86	2.42
1984 - 85	1.20	38.07	46.98	37.26	0.81
Total	3.25	136.21	155.69	124.33	11.88
<u>Phase II</u>					
1986 - 91	10.13	281.48 ¹	282.00 ²	241.10 ³	40.38
Total Decade	13.38	417.69	437.69	365.43	52.26
¹ Country Demand includes Sector Demand and assumed to increase at 6% per year during Phase II. ² Likely Capacity assumed to remain static at 47.0 million metric tonnes per year during Phase II. ³ Expected Production assumed to increase to 90% of likely capacity by 1991, an average increase of 5% during Phase II.					

Table 19, Appendix I shows Decade Programme cement requirements by State and Union Territory.

The projected shortfalls between national demand and production in both Phase I and Phase II of the Decade Programme confirms the Government's concern regarding the inadequacy of cement production to meet national needs, let alone those of the sector. If national demand continues to increase at the projected rate of six percent annually, the resolution to the production problem is two-fold: increase likely in capacity through improvement in existing plants of their operation and management, and the construction of new plants; and/or import cement from external sources in quantity to satisfy demand. This is especially valid in respect of the Phase II projected demand and production.

During Phase I, new plants are coming on line and annual shortfalls are decreasing, until the last year of Phase I (end of Sixth Development Plan) the shortfall is less than one million metric tonnes. At this point shortfalls will have accumulated to around 12 million metric tonnes. During Phase II, however, the situation is different in that likely capacity remains at 47 million metric tonnes annually, unless new facilities are brought into operation, and shortfalls will accumulate over the six year period of 40 million metric tonnes. The total shortfall of cement to meet national demands during the Decade period will be over 52 million metric tonnes.

9.2.3 Other Sector Materials and Equipment

Table Q provides estimates of Phase I and Phase II requirements of steel, chemicals, pumps, transportation and energy for the Decade Programme. Tables 20-26, Appendix I give detailed data on these materials and equipment.

An assessment of the availability and sufficiency of the above material and equipment to fulfill Decade Programme requirements indicates that no problems are envisaged.

Table Q

Item	Unit	Phase I	Phase II	Decade Total
Mild Steel Bars & Plates	MT (millions)	0.56	1.72	2.28
Chemicals:				
coagulants, disinfectants, etc.	MT (millions)	1.39	3.23	4.62
Pumps:				
electric	No (000's)	49.62	148.82	198.44
hand	"	88.26	654.59	742.85
Transportation:				
trucks, trailers, cycles, etc.	No (000's)	19.28	44.97	64.25
Energy:				
electric power	MW (000's)	0.74	1.88	2.62
petrol	MT (000's)	101.61	366.63	468.24
diesel	"	190.62	625.92	816.54
lubricating oil	"	14.70	47.35	62.05

9.3 Suggested Actions to Benefit the Sector

Specifically, actions were taken in the following major material and equipment areas: pipe, mild steel bars and plates; cement; pumps; vehicles; electric power; and fuels, such as petrol, diesel and lubricating oil. These actions have produced suggestions with respect to the aforementioned areas.

9.3.1 Pipe

Plastic Pipe

It is suggested that the Government review and if possible remove the import duties levied on imported resins and the excise duties on

indigenous resins. The finished product would be less expensive which is essential for the implementation of rural water supply schemes.

AC Pressure Pipe

The Panel for Asbestos Products is under reorganization and will soon look into requirements of AC products for various uses. Cement and asbestos fibres are the two basic raw materials for making AC pressure pipe. Since, cement is already in short supply in the country, all asbestos fibre is being imported, it is felt that the Panel should make available the necessary raw materials to the concerned industries for the manufacture of these pipes, in order to meet the requirements.

GI Pipe

The procurement of raw materials for the manufacture of GI pipes is a difficult problem and the Ministry of Industry may be able to take remedial measures, in order to meet the requirements of the Decade Programme.

Stoneware Pipe

The DGS&D has been requested to finalise the rate contract of this item, and any States experiencing difficulty in the procurement of stoneware pipe are requested to contact DGS&D, furnishing the particulars of orders placed, the quantities required and other relevant details so that they may resolve the matter.

CI Pipe

The assessment indicates that there is a shortage of pipe in the country, which has affected sector programmes. This is due to shortage of raw materials and power, industrial relations problems and the general non-availability of transportation vehicles. Since the shortage is very acute in the smaller size, the Ministry of Works and Housing has already issued a circular to all the State Governments and Union Territories urging them to use alternative pipe materials to assist in overcoming this shortage. The response from the state governments is very encouraging. Keeping in view the above, the following recommendations are made:

- At present cast iron pipes are manufactured upto the size of 750 mm diameters. Therefore, the concerned State Governments who want to use pipes above this size are requested to use alternative pipe, e.g. RCC/pre-stressed concrete pipe, etc.
- One of the important raw materials used is pig iron. Government should explore the possibility of reducing the customs duty on imported pig iron, so that the price of the finished product could be within the range of rate contract entered into with DGS&D. Similarly, the industry

should have available sufficient supplies of hard B.P. coke and ferro-silicon. Export of ferro-silicon should be reviewed so that the quantity required for the manufacture of CI pipe to meet the demand of the Decade is available to the industries.

- At present CI pipe manufacturers import moulds for the manufacture of spun pipe. Efforts should be made to have them manufactured through Heavy Engineering Corporation, Ranchi, so that the dependence on import could be reduced and at the same time save valuable foreign exchange.

Ductile Iron Pipe

Ductile iron pipe is light, economical and has long useful life. Efforts should be made to encourage industries to manufacture this type of pipe.

PSC Pipe

While ordinary RCC pipes can cater to the needs where pressures are low and steel pipes cater to the needs of higher pressure, the prestressed concrete pipes cater to the intermediate pressure range, for which metallic pipes are expensive and RCC pipes would not be suitable. However, stringent quality control is called for in production of casket jointing work for a trouble free pipe line.

Steel Pipe

Due to their elasticity, steel pipes adapt themselves to changes in relative good level without failure. They can withstand high pressures. However, they are more expensive than any other alternative. They invariably need protection from corroding.

Steel welded Pipe & Cylinder Pipe

These can be an alternative to the use of PSC and steel pipes effecting over all economy and ensuring more flexibility and durability and assured satisfactory performance. These provide ample protection from surge and water hammer. They have dependable water tight jointing system. Steel cylinder pipes provide positive water seal.

This type of spiral steel strip welded pipes with concrete coating combine the physical strength of steel with the protective characteristics of cement mortar.

If the above efforts fail to meet the pipe requirements of the Decade Programme, the only alternative is to import these pipes from abroad. This should be resorted to as a last measure.

9.3.2 Handpumps

The Indian Standards Institution has prepared specifications for deep-well handpumps called "INDIA MARK II" under the specification number IS: 9301-1979. Recently, they have revised this specification. All pump manufacturers should follow this new specification and get ISI marking. State Governments should purchase only those pumps which conform to ISI specifications and have ISI marking.

The demand for this type of pump is expected to increase in the years ahead. At present, purchases are made by State Governments at different prices and the quality of pumps is not uniform. In order to overcome this, it is suggested that the rate contract for the supply of these pumps be concluded by DGS&D. This will prevent sub-standard pumps being purchased at cheaper prices.

9.3.3 Cement

Cement is in short supply, at present, in the country. The Planning Commission has received reports that the industry would reach a stage of self sufficiency by 1984-85. However, if the production of cement is not sufficient to meet the demand, including the water supply and sanitation sector, advance planning for import of cement should be made by the Ministry of Industry, Department of Industrial Development. While allocating the cement to the various State and Union Territory Administrations, the cement required for the water supply and sanitation sector should also be earmarked.

9.3.4 Vehicles

The Ministry of Industry (Department of Industrial Development) has advised the manufacturers (numbering about 13) regarding the requirement of vehicles of various types needed in the programme. However, to enable the manufacturers to supply the right type of vehicles, it is suggested that State Governments while placing orders should furnish the following particulars: complete specifications, models and types and any other relevant details.

If the procurement is desired to be done through DGS&D, formal indents completed in all respects should be sent to them. This will enable DGS&D to determine whether their requirements can be met from indigenous sources or have to be imported.

9.3.5 Energy

- Power - The statements indicating the requirement of various State Governments and Union Territory Administrations for electric power for the water supply and sanitation sector have been forwarded to the Ministry

of Energy. It is also suggested that the State Governments should advise the electricity boards in their States indicating the requirements so that the boards may take necessary action on their behalf. For rural water supply schemes, it is suggested that energy may be supplied at concessional rates, as in the case of agriculture.

- Petrol, Diesel and Lubricating Oil - The requirements of the various States and Union Territories have been forwarded to the Ministry of Petroleum Chemicals and Fertilizers. This Ministry must take into consideration the requirements of the water supply and sanitation sector, while importing these items. They should earmark the quantity to be given to this sector, while allocating these items to the States and Union Territories from time to time.

9.3.6 Transportation

The State Governments and Union Territory Administrations should provide the overall requirements of wagons for the first four years and the subsequent six years of the Decade programme to the Traffic Transportation Directorate of the Railway Board in advance, commensurate with the stock of materials ready for despatch in order to arrange the highest priority for transportation of pipe and other essential material and equipment required for the sector.

9.3.7 Rate Contracts

It is recommended that the DGS&D explore the possibility of developing a system of running contracts instead of rate contracts with regard to materials and equipment required for the Decade programme.

9.3.8 Drilling Rigs

Keeping in view the low cost solutions to tackle the drinking water problem, the available ground water should be exploited where it is feasible. This is more so especially in consolidated and semi-consolidated foundations, including hard rock areas which form the major part of the country's area. The development of Down-the Hole (DTH) drilling rigs in the past few years has opened up vast potential of exploiting such ground water sources for village water supply aided by the newer version of dependable deepwell hand pumps (INDIA Mark II).

The development of other types of rigs notably, rotary, cable tool, etc., are also well established in suitable formations for this activity. Keeping in view the full capacity utilisation of existing rigs with the State Governments and also mobilising the use of available privately owned rigs, an assessment for the additional rigs required for the implementation of the Decade Programme is made by a Committee constituted by the Ministry of Works and Housing. The Committee has assessed the requirement of different types of rigs in two phased periods:

<u>Type</u>	<u>1983-85</u>	<u>1985-90</u>	<u>Total (1983-90)</u>
DTH 100 mm (4") diameter	91	20	111
DTH 150 mm (6") diameter	109	36	145
Direct Rotary	106	83	189
Reverse Rotary	13	16	29
Cable Tool	49	17	66
Combination	98	10	108
Total:	<u>466</u>	<u>182</u>	<u>648</u>

The State-wise listing of drill rigs is shown in Table 27, Appendix I.

Considering the present licensed production capacity of different types of rigs in the country, most of the requirements can be met. However, there may be a need to import 54 DTH (6"), 8 Direct Rotary, 2 Cable Tool and 47 Combination rigs. In these cases also, only certain crucial components and spares must be imported thus making use of maximum number of suitable components that are indigenously available. The implementation can be effected through UNICEF Assistance Programme or direct import by Government of India, including bilateral donor programmes.

Towards proper operation and upkeep of the maintenance of the rigs, State Governments should establish/improve the workshop facilities in this regard together with the timely supply of spares and arrange training facilities for well drillers.

9.3.9 Research and Development

It is suggested that research and development be carried out by the National Environmental Engineering Research Institute at Nagpur or similar institutions on the following items:

- Polymers - For the treatment of water which would reduce the chemicals to be used, resulting in greater economy.
- Rejuvenating old pipe - The replacement of existing pipes is a costly proposition. There are methods employed in foreign countries by which old pipes are rejuvenated and reused even without removal from the ground.
- Use of fibre glass materials - For the manufacture of water closets, manhole chambers; etc.

- Development of variable speed motors - To deal with variable flow rates of water.
- Ductile Iron Pipe - Explore the best ways and means of producing ductile iron pipe and the special type of pig iron required, and the costs involved.

In general it is very essential to have nodal bodies at the Central, State and Union Territory levels for the purpose of channeling and monitoring sector material and equipment procurement, supply and distribution.

10. PROJECT FORMULATION

10.1 General

In order to meet the varying conditions and characteristics of different States and Union Territories in the provision of water supply and sanitation services appropriate project preparation is absolutely essential. This concept applies to all projects, large or small, complex or simple. Without this important element brought into play considerable effort and substantial resources could be wasted. Further, the intense competition to obtain funds for projects within the country between lending agencies, the water supply and sanitation sector and other sectors, as well as attracting and securing what may be very limited financial resources from external agencies, demands adequately prepared and viable projects. This can be achieved through integrated administrative support and by professional personnel competent to perform the required tasks.

Since both limited financial resources and shortage of professional manpower may be significant constraints in many States/UT's, the responsible sector agencies must be encouraged to use methods designed to make the planning, preparation and implementation of projects as efficient as possible. Improvements in the project development process bring benefits to international, national and local agencies supporting the sector, but ultimately the primary beneficiaries are those people in the States and Union Territories who presently lack access to these basic services.

10.2 Planning and Preparation Units

The establishment of project planning and preparation units within agencies responsible for urban and rural water supply and sanitation can provide the desired efficient project development process. Such units are usually composed of one or more teams of sanitary, public health and/or environmental engineers, economists, financial analysts and social scientists. A number of States have such planning and preparation units in operation and could provide training and other assistance to States and Union Territories that do not have but desire and need to establish such units in their sector agencies. The recruitment and training of the required personnel for such units should be given a very high priority in the nation's development of its manpower resources.

10.3 Unit Operations and Functions

Planning and preparation units would be continuously involved in the four essential stages of project development, namely: identification; investigation; preparation; and implementation. All projects regardless of their funding sources, whether new, augmentation/extension or rehabilitation/improvement, would be developed by planning and preparation units along criteria acceptable to national and external assistance and lending agencies, thus ensuring the implementation of only the most economic and engineeringly feasible projects.

The following Table R shows the four stages of project development:

Table R

Development Stage	Activity
<u>Pre-investment Phase</u> 1. Identification 2. Investigation 3. Preparation <u>Investment Phase</u> 4. Implementation	Project Selection, Location & Type Pre-Feasibility Study & Alternative Options Preliminary Engineering & Feasibility & Selection of Favored Project Detailed Design & Construction

The project development process with some of the typical tasks involved at each stage is further detailed as follows:

- | | |
|----------------|---|
| Identification | <ul style="list-style-type: none"> - project selection within State/UT Decade/ Master Plans commensurate with national/ state priorities & strategies - assessment of community involvement - probable source of funding - type of project & probable manpower and materials & equipment requirements - establish terms of reference for investigation stage |
|----------------|---|

Investigation

- survey of site location citing any unusual or potential difficulties in topography, water source quantity a/o quality, etc.
- collection of basic data and assessment both quantitative and qualitative
- preliminary determination of possible alternative solutions and options
- assessment of advantages/disadvantages of alternatives

Preparation

- preliminary design and feasibility of alternatives using national/state design norms/standards and manuals of practice
- preparation of preliminary cost estimates of alternatives using costing methods/prices appropriate to locale or region
- determination of most feasible project from engineering and economic aspects

Implementation

- detailed and comprehensive design of chosen project
- preparation of complete project costs
- preparation of materials & equipment and manpower requirements
- construction of project and supervision of construction

National lending agencies and particularly international agencies and bilateral donor countries generally make their final decision to provide money to projects after a thorough review and appraisal of detailed proposals of projects. Such proposals must be of sufficient detail to have completed the three stages of the pre-investment phase of the development process or at least the first two stages with sufficient study of the third phase completed to have narrowed projects to two or at the most three alternatives, where assistance from the lending agencies may be sought in the selection of the most feasible project. The development of project proposals, therefore, are necessary in the quest for funding assistance, and to prepare them adequately and efficiently is mandatory.

The States and Union Territories have been requested by the Central Government to prepare a shelf of projects and to summarize such projects in "Project Data Sheets", which have already been provided. These project summaries will be compiled in a compendium of projects in water supply and sanitation for reference and distribution by assistance agencies, both national and international and will form Volume II of the National Master Plan for Water Supply and Sanitation.

11. OPERATION AND MAINTENANCE

11.1 General

The poor state of operation and maintenance of water supply schemes set up during the last five development plans is causing genuine concern to sector authorities. Particularly in the rural areas a number of systems are not operational and others are giving unsatisfactory service. Inattention to this critical aspect could easily result in undue deterioration cutting the useful life of the systems by 50 to 75 percent and necessitating premature replacement of many systems components. This is not only a waste of original investment capital, but a severe set-back in attaining Decade Programme goals.

Similarly pilot field studies by NEERI have shown water losses in the distribution system alone to be of the order of 23 to 35 per cent of the total flow in the system. In addition, losses occur in transmission, in the water treatment plants and at source, which may come to another 30 per cent of the total output. In the distribution system, it is feasible to reduce water losses to a level of 10 per cent of total flow by carrying out systematically leakage assessment, detection and control. For the urban population in India, the value of recoverable loss of processed water has been estimated to be of the order of Rs.50 crores annually. Greater attention to water conservation and waste detection and control can help in augmentation of available supplies and thus in attaining Decade goals.

In view of the large capital investments planned in the Decade Programmes, the vital area of systems operation and maintenance deserves immediate and sustained attention. The States and Union Territories should determine and provide adequate resources in their development plans for operation and maintenance of facilities to be created. An amount of Rs.533 crores or about five percent of Phase II investment has been estimated in the Seventh and Eighth Development Plans of the Decade Programme to be used for operation and maintenance expenditures.

11.2 Existing Situation

11.2.1 Water Supply

In major metropolitan areas and other large cities, municipal corporations and metropolitan water boards that have been formed in certain States look after operation and maintenance. The resources for this activity are generated out of water charges that are collected and in certain cases augmented by revenues of municipal corporations from other than water accounts. There is no difficulty envisaged in the operation and maintenance in these areas.

In smaller towns, the responsibility for operation and maintenance rests with the municipalities, and in States, where urban water supply boards are formed, the Boards look after this activity. In other States, the public health engineering departments discharge the responsibility of maintenance. In these cases, the major constraint is usually financial due to inadequate resources generated from water tariffs. These towns indent for technical help from the public health engineering departments, whenever necessary.

Water supply maintenance in rural areas, where comprehensive regional water supply systems are in operation, is handled mainly by State public health engineering departments or panchayats. In a few cases, local bodies like Zila Prishads or Block Level Samitis are entrusted with this responsibility. Water rates are not charged nor any other funds for water service recovered from the rural population and due to the lack of financial and technical resources, Local bodies are not in a position to maintain the systems.

Regarding piped water supply systems in the villages, the situation is usually much worse as the Panchayats are not in a position, either financially or technically, to maintain the system. These are functioning only where State Governments and Union Territories are making adequate allocations for maintenance.

In individual single point water supplies, either from dug wells, tubewells, springs or public standpost systems, there is no responsible institution to provide proper systems maintenance, though State Governments are trying to lend financial support in a limited way.

11.2.2 Sanitation

In sanitation, especially in rural areas, there is no organized system of maintenance at present relative to individual facilities. Sanitary facilities such as individual family latrines, etc. must be maintained by the families. In smaller towns, where sewerage systems do not exist and low cost sanitation programmes are in operation, the individual beneficiaries are in charge of maintenance. In the larger cities, where sewerage systems exist, the municipalities are responsible for systems maintenance.

11.3 Support Resources

11.3.1 Institutional and Administrative

In all major metropolitan areas and large cities, single agencies such as water supply and sewerage boards or municipalities should be responsible for systems operation and maintenance. In such urban systems, to the extent possible, realistic water rates should be established thus generating revenues that could support all or part of the operation and maintenance costs. Any gap or shortage between costs and revenues should be supplemented by the State and Union Territories.

In rural water supply systems, local situations will determine the agencies to be entrusted with responsibilities for systems operation and maintenance. It can be a local body, a board or a department of Government, but it is necessary that a single agency be responsible for providing financial, technical and supervisory support for operation and maintenance. Actual routine operations and maintenance are carried out, however, at the local levels, but the provision of materials and equipment, their replacement and repair, together with the training, supervision and technical guidance required by local personnel, must come from the responsible single agency.

11.3.2 Manpower

The number of personnel employed to manage, operate and run the water supply systems depends upon the size and nature of the plants and distribution networks. It has proved successful in many places to select and train the key personnel at the construction phase, who later will be responsible for operational duties. During this phase the men have an opportunity to learn how the system has been put together and works, and in this way they can best understand and perform the required maintenance. In-service training for operation and maintenance personnel should be frequent and obligatory.

11.3.3 Materials and Equipment

Spares, materials, equipment, proper type of tools, and purchasing and storing of necessary chemicals well in advance of use are extremely important factors in achieving efficient plant operation. In urban areas it may be possible to procure and store all the material components required for maintenance and operation. But in case of rural water supply systems, it may be difficult. Storing of spares and materials at Block levels will have to be made with proper transport facilities from the responsible agency through its central or regional offices.

Systems of warehousing and procurement will have to be studied and established in order to maintain an effective and timely distribution of required materials and equipment.

11.3.4 Community Participation in Relation to Operation and Maintenance

The local community has an important role to play in the operation and maintenance of water supplies and sanitation facilities, especially in the rural areas. Local bodies, leading citizens, religious leaders, teachers and other individuals can provide the impetus needed to assist in the proper operation and maintenance of community facilities.

Many prominent citizens may not be members of the local bodies but at the same time they may bring even more influence to bear on the success of the programme than does the official administration. The main advantages of this may include:

- the mobilization of the political support;
- contribution of the community to the project in terms of money, land, material, services or labour;
- a more sympathetic attitude from the people towards paying for the operation and maintenance cost; and
- the increased use of the water once it is supplied.

In case of rural water supplies and sanitation, the Non-Governmental Organisations have made significant achievements in certain parts of the country. Such organisations should be associated with the Decade Programme for proper up-keep of the facilities installed. Non-Governmental Organisations, their capabilities and involvement in sector work, is discussed in 5.8 and 5.9 of this document.

It is extremely important to understand that small water supply systems do not imply either small problems or small responsibilities. The local population needs to be educated regarding benefits of water supply systems and develop a sense of ownership and pride in the same, and to understand that it has a right to demand better services. These processes are neither simple nor quick, much will depend on the effectiveness of the management and proper services in establishing good public relations. Once these are obtained the service concept will grow and become generally understood and accepted. The critical time is in the early stages.

The Government of India already realising the importance of the operation & maintenance sector during the Decade Programme and onward has constituted a Committee to go into this aspect exclusively and make recommendations.

11.3.5 Suggested Elements of a Support Programme

Elements which should be incorporated as a support programme for operation and maintenance include:

- allocation of responsibility for preventive maintenance and repair at community, district, regional and State levels, together with logistical planning support;

- strengthening of services at appropriate levels, for materials and spare parts, ordering, storing and distribution;
- development of replacement and repair facilities, e.g. for water meters in urban areas and for hand-pumps, cylinders and vehicle overhaul in rural areas.
- training of the instructors/trainers at the lowest possible community level so as to provide instruction to community workers; and
- a rehabilitation and replacement programme of installed equipment, listing present and future requirements of expendable components and materials.

12. EXTERNAL AND INTERNAL ASSISTANCE

12.1 General

Extensive assistance, both external and within-country, will be required by the States and Union Territories in the financing of their Decade programmes. The cost of the Decade Programme, an estimated Rs.14,700 crores or US \$18,846 million at 1980 price levels, demands a very thorough exploration of all possible avenues for sources of funds as well as the most effective utilization by the sector of those funds when obtained. The continuation of financing by national agencies, multilateral organizations and bilateral donor countries is necessary, and most likely in increased amounts during the coming years. Estimates of the amounts of the assistance needed by the States and Union Territories for their programmes are under preparation, projects being formulated at the request of the Central Government. A compendium of programmes and projects for each State and Union Territory should be ready in 1983 for publication and distribution to interested national, multilateral and bilateral development and financing agencies.

12.2 On-going Project Assistance

A listing of financial assistance on specific projects by multilateral agencies and bilateral donor countries is given in Table S. Table 28, Appendix I, provides details on the on-going projects. Direct project assistance is being received from the World Bank/IDA and the Government of the Netherlands, Denmark, the Federal Republic of Germany and the European Economic Community. The total estimated costs of these externally assisted projects is Rs.963.32 crores, of which Rs.554.91 crores is foreign assistance. Almost all of these projects are likely to be completed by the end of the Sixth Development Plan, Phase I of the Decade Programme, or during the first year of the Seventh Development Plan. It is estimated that approximately 80 percent of this assistance would be utilized during the sixth plan period or an amount of Rs.445 crores. Since the Seventh Development Plan investment

in the water supply and sanitation sector is expected to be more than double the amount of the Sixth Plan, it is expected that external assistance would also be increased substantially.

Table S

On-going Project Assistance (Rs. in crores)				
Agency	Number of Projects	Project costs	External Assistance	Percent of External Assistance
World Bank/IDA	6	841.00	460.73	54.8
Netherlands	6	55.95	53.53	95.7
Denmark	6	31.40	13.14	41.8
Fed. Republic of Germany	1	19.47 ¹	9.51	48.8
European Economic Community	1	15.50	18.00 ²	
Total	20	963.32	554.91	57.6

1 Phase I of a possible three phase project, total cost estimated at Rs.60 crores.

2 Counterpart fund in Rupees

The UNICEF is providing assistance in the areas of training, drilling, handpump rejuvenation and installation, health education and environmental sanitation. The assistance from UNICEF is governed by the Plan of Operations signed between the Government of India and UNICEF.

The input from the regular programmes of UNICEF for the period 1981-83 is likely to be of the order of US \$ 21 million and US \$20.6 million in noted or supplementary assistance, US \$5.6 million from Denmark (DANIDA) and US \$15.6 million from Sweden (SIDA). As at the end of 1982, US \$5.1 million of Denmark's allocation and US \$5.0 million of Sweden's and had been spent. The level of assistance is not likely to increase appreciably in the coming years and planning must be done on the basis of present assistance levels during the remaining years of the Decade.

The UNDP, WHO and ODA are assisting the Decade efforts in this country in the field of support services. The assistance from these agencies is in the form of experts, consultants, grants, training facilities, fellowships, equipment and conduct of feasibility studies.

The UNDP has funded a pre-investment study for the Madras Metropolitan area for the Tamil Nadu Water Supply and Sewerage Works and a low cost sanitation project for several States of over 100 urban towns. Also certain hydrogeological and artificial recharge studies are currently being undertaken by UNDP at Madras.

In addition to the external funding as shown, substantial financing of sector projects comes from the national agency, the Life Insurance Corporation (LIC), the major source of finance for implementation of programmed projects. At the time of the formulation of the Sixth Development Plan the LIC made available resources during the Plan period at a rate of six to seven percent of its annual investible funds. Because of the magnitude of the Decade Programme's total cost, an annual increase of 15 to 20 percent in the provision of funds is recommended to be accomplished by internal re-allocation and the likely increase in its business and availability of larger investible resources. In view of the high priority and international commitments relating to the Decade Programme, the LIC has agreed to earmark at least eight percent of their annual investible funds to the sector in comparison to the earlier mentioned six to seven percent. Table T shows LIC funding for the past three years and an estimate of funds that may be anticipated in the remaining three years of the current Sixth Development Plan.

Table T

Sector Investment (LIC)	
Year	Rs.crores
1979/80	50.00
1980/81	79.60
1981/82	85.00
1982/83	100.00
1983/84	125.00
1984/85	140.00
Total	579.60

12.3 Assistance to Projects in Pipeline

Table U provides information on the assistance to projects in the pipeline by multilateral and donor countries for anticipated execution during the remaining years of the Sixth Development Plan and the early years of the Seventh Plan or Phase II of the Decade Programme

Table U

Assistance to Projects in Pipeline (Rs. in crores)		
Agency	Number of Projects	Project ¹ costs
World Bank/IDA	4	445.96
Netherlands	9	25.55
Denmark	4	26.58
European Economic Community	2	19.76
Total	19	517.85

1 The amount of foreign/external assistance is yet to be determined.

Under this assistance the World Bank/IDA has 4 major projects in various cities and states for consideration at an estimated total costs of Rs.446 crores. The amount of the funding for these projects has not as yet been determined. Funding for these projects and others are subject to availability of resources in the States Plans and World Bank final approval. A list of the projects developed to date and estimated costs are shown in Table 29, Appendix I, together with the bilaterally assisted projects, nine with the Netherlands, four with Denmark and two with the European Economic Community.

VOLUME I

PART I

APPENDIX I

TABLES AND FIGURES

MASTER PLAN
for
Water Supply and Sanitation Sector
(1981 - 1990)

INDICATORS - DEMOGRAPHIC, ECONOMIC AND HEALTH

State/Union Territory	Population (100,000)	Total	Percentage of Population Below Poverty Line			Adult Literacy (percent)	Crude Birth Rate (per 1,000)	Crude Death Rate (per 1,000)	Infant Mortality			Water Supply (percent)	Sanitation (percent)
			Urban	Rural	Combined				U	R	C		
States													
1. Andhra Pradesh	514,104	2,200	25.7	43.9	42.2	29.84	33.6	13.2	84	127	117	27.3	32.2
2. Assam	199,690	1,000	37.4	52.7	51.1	28.15	30.8	13.2	86	120	119	28.7	35.6
3. Bihar	682,461	3,000	46.1	58.9	57.5	26.01	-	-	-	-	-	30.5	34.0
4. Gujarat	330,526	1,400	29.0	43.2	39.0	43.95	33.8	12.7	89	131	122	27.3	34.7
5. Karnataka	124,819	1,000	31.7	23.3	24.9	33.84	33.5	13.3	80	117	109	68.9	37.3
6. Jharkhand	42,274	1,317	16.6	28.1	27.3	41.84	27.3	11.8	67	103	107	48.7	39.0
7. Jammu & Kashmir	59,816	220.0	39.3	37.8	34.1	18.58	31.8	11.7	51	81	72	30.6	38.4
8. Karnataka	356,022	1,919	44.0	49.9	48.3	38.61	29.2	15.9	58	90	87	50.3	39.8
9. Kerala	259,602	98.8	51.4	46.0	47.0	69.17	25.2	7.0	27	45	42	65.8	38.5
10. Madhya Pradesh	530,490	441.8	48.1	59.8	57.7	27.82	37.2	15.1	87	131	143	42.1	39.0
11. Maharashtra	608,232	307.3	31.6	55.9	47.7	47.37	26.9	10.3	63	88	81	33.2	36.2
12. Manipur	14,640	22.4	25.5	30.5	29.7	41.99	32.2	7.6	33	25	25	63.8	100.0
13. Meghalaya	13,709	32.5	18.2	33.9	48.1	33.22	32.0	10.2	-	-	-	78.8	100.0
14. Nagaland	7,145	15.3	4.1	-	4.1	41.99	22.9	8.5	-	46	-	43.0	100.0
15. Orissa	270,643	1,100	42.2	69.8	66.4	38.32	32.9	14.1	80	137	133	47.0	39.0
16. Punjab	368,524	1,000	24.7	11.9	15.2	40.78	29.4	11.6	76	126	117	44.2	37.8
17. Rajasthan	334,537	1,000	33.8	33.7	33.7	24.05	35.5	15.6	85	153	140	34.3	39.1
18. Sikkim	3,100	7.2	-	-	-	33.83	-	-	-	-	-	35.1	100.0
19. Tamil Nadu	473,046	130.2	44.8	55.7	52.1	43.78	28.8	12.8	63	120	105	37.1	36.1
20. Tripura	21,040	10.5	26.3	66.3	39.7	41.58	28.8	11.6	71	106	104	32.8	100.0
21. Uttar Pradesh	1,057,287	4,000	49.3	50.2	50.1	27.38	40.4	20.2	114	184	177	30.7	37.6
22. West Bengal	559,250	88.7	34.71	38.9	32.6	40.88	28.4	11.6	-	-	-	73.0	38.0
Union Territories													
1. Andaman & Nicobar Islands	1,388	0.1	18.0	34.3	21.7	31.27	33.1	8.3	-	-	-	34.1	37.4
2. Arunachal Pradesh	6,355	39.7	-	-	-	20.09	30.6	17.3	-	-	-	34.3	36.5
3. Chandigarh	5,171	1.1	-	-	-	64.68	26.5	4.3	-	-	-	7.2	7.2
4. Dadra & Nagar Haveli	0,885	0.3	-	-	-	26.60	26.2	17.5	-	-	-	45.4	100.0
5. Delhi	61,842	0.3	-	-	-	61.06	25.7	8.1	64	110	70	19.4	40.3
6. Goa, Daman & Diu	11,609	3.8	-	-	-	55.86	21.0	9.2	31	61	54	37.0	95.0
7. Lakshadweep	0,358	0.04	-	-	-	56.72	30.6	8.9	-	-	-	32.0	100.0
8. Mizoram	4,180	11.3	-	-	-	38.50	-	-	-	-	-	70.9	100.0
9. Pondicherry	5,350	0.3	-	-	-	34.23	27.4	10.6	-	-	-	27.7	39.8

Reference Publications

- Economic Survey, 1981/82, Government of India
- World Development Reports, 1981 & 1982, World Bank
- Health Statistics of India, 1981, Government of India
- Family Welfare Programme in India, 1980/81, Government of India
- The New 20 Point Programme, 1982, Government of India
- Bulletin of Regional Health Information, 1981, World Health Organization/SEARO.

State/ Union Territory	Year	Population Served or Targetted (in millions)													
		Total Population			Water Supply						Sanitation				
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total		
Andhra Pradesh	1981	11.05	40.37	51.42	6.91	62.5	18.78	41.1	23.5	46.0	1.40	12.7	-	1.40	3.0
	85	12.20	42.42	54.62	7.42	60.8	22.98	66.0	35.2	64.6	1.40	11.5	0.75	1.8	2.15
	91	14.27	45.72	59.99	10.00	100.0	45.72	100.0	59.99	100.0	10.00	70.3	11.43	25.0	22.65
Assam	1981	2.40	17.57	19.97	0.53	22.0	3.50	19.9	4.03	20.2	0.30	12.5	0.18	1.0	0.48
	85	2.70	20.01	22.71	0.93	34.4	8.12	40.6	9.05	39.9	0.42	15.6	0.18	0.9	0.60
	91	3.15	23.67	26.82	3.15	100.0	23.67	100.0	26.82	100.0	3.15	96.0	5.92	25.0	8.44
Bihar	1981	7.85	60.05	67.90	5.53	70.2	41.92	69.2	27.25	69.5	1.72	22.2	3.36	3.8	2.17
	85	8.80	64.04	72.84	6.12	69.1	52.05	89.1	43.17	88.2	1.88	21.4	2.34	3.7	4.24
	91	10.47	69.53	80.00	10.47	100.0	69.53	100.0	80.00	100.0	8.38	80.0	12.35	25.0	25.76
Gujarat	1981	9.93	23.13	33.06	0.43	95.0	16.26	70.3	25.69	77.7	2.37	44.0	0.06	0.3	4.43
	85	10.93	24.58	35.51	10.75	98.4	31.35	86.2	31.91	90.0	7.60	69.5	0.11	0.5	7.71
	91	12.68	26.79	39.47	12.68	100.0	26.79	100.0	39.47	100.0	10.14	80.0	6.70	25.0	16.84
Harvna	1981	2.40	10.09	12.49	1.13	47.0	2.76	27.3	3.89	31.1	0.35	14.5	-	-	0.35
	85	2.67	10.86	13.53	1.57	59.0	6.03	55.5	7.60	56.2	0.64	24.0	0.10	1.0	0.74
	91	3.14	11.96	15.10	3.14	100.0	11.96	100.0	15.10	100.0	2.51	79.9	2.99	25.0	5.50
Himachal Pradesh	1981	0.32	3.90	4.22	0.33	95.6	1.81	46.3	2.14	50.2	0.05	13.2	-	-	0.05
	85	0.36	4.15	4.51	0.37	97.4	3.39	81.4	3.75	82.8	0.07	16.4	-	-	0.07
	91	0.45	4.55	5.00	0.45	100.0	4.55	100.0	5.00	100.0	0.36	80.0	1.14	25.1	1.50
Jammu & Kashmir	1981	1.23	4.76	5.99	1.23	100.0	1.74	36.4	2.97	49.4	0.10	8.0	-	-	0.10
	85	1.39	5.16	6.55	1.32	95.0	2.87	55.6	4.19	64.0	0.20	14.4	0.10	1.9	0.30
	91	1.70	5.86	7.56	1.70	100.0	5.86	100.0	7.56	100.0	1.36	80.0	1.47	25.1	2.83
Karnataka	1981	9.58	26.06	35.64	9.53	99.8	8.16	31.3	17.69	29.7	3.62	37.9	0.04	0.1	3.66
	85	10.56	27.43	37.99	9.89	93.6	13.12	47.8	23.01	60.6	4.05	38.4	0.04	0.2	4.09
	91	12.17	29.11	41.28	12.17	100.0	29.11	100.0	41.28	100.0	9.73	80.0	7.28	25.0	17.01
Kerala	1981	4.69	21.28	25.97	2.85	60.8	6.05	28.4	8.90	34.3	0.30	6.4	0.10	0.5	0.40
	85	5.19	22.47	27.66	3.11	60.0	8.62	38.4	11.73	42.4	0.45	8.7	0.18	0.8	0.63
	91	6.06	24.31	30.37	6.06	100.0	24.31	100.0	30.37	100.0	4.85	80.0	6.08	25.0	10.93
Madhya Pradesh	1981	9.81	43.24	53.05	7.10	72.4	13.04	30.2	20.14	37.9	0.54	5.5	-	-	0.54
	85	11.12	46.43	57.55	9.05	81.4	19.19	41.3	28.24	49.1	0.85	7.7	0.05	0.1	0.90
	91	13.76	52.37	66.13	13.76	100.0	52.37	100.0	66.13	100.0	11.00	80.0	13.09	25.0	24.09
Maharashtra	1981	21.04	39.78	60.82	20.87	99.2	7.63	19.2	28.50	46.9	8.42	40.0	-	-	8.42
	85	23.21	41.36	64.57	23.21	100.0	18.14	43.9	41.35	63.9	12.82	55.2	-	-	12.82
	91	27.48	44.35	71.83	27.48	100.0	44.35	100.0	71.83	100.0	21.99	80.0	11.09	25.0	33.08
Manipur	1981	0.37	1.10	1.47	0.26	70.3	0.27	24.6	0.53	36.1	-	-	-	-	-
	85	0.50	1.16	1.66	0.46	92.0	0.83	71.6	1.29	77.7	0.02	4.0	0.01	0.9	3.03
	91	0.69	1.24	1.93	0.69	100.0	1.24	100.0	1.93	100.0	0.55	79.7	0.31	25.0	0.86
Meghalaya	1981	0.23	1.10	1.33	0.06	27.8	0.22	19.6	0.28	21.1	-	-	-	-	-
	85	0.26	1.18	1.44	0.26	100.0	0.53	43.2	0.77	53.6	-	-	0.01	0.9	0.01
	91	0.33	1.33	1.66	0.33	100.0	1.33	100.0	1.66	100.0	0.26	78.8	0.33	24.8	0.55
Nagaland	1981	0.25	0.49	0.72	0.07	30.4	0.33	67.4	0.40	55.6	-	-	-	-	-
	85	0.26	0.55	0.81	0.09	34.6	0.55	100.0	0.64	79.0	0.01	3.9	0.02	3.7	0.01
	91	0.32	0.64	0.96	0.32	100.0	0.64	100.0	0.96	100.0	0.26	81.1	0.16	25.0	0.42
Orissa	1981	2.73	24.34	27.07	1.07	39.2	7.86	32.3	8.93	33.0	0.29	10.7	-	-	0.29
	85	3.10	25.78	28.88	1.43	46.1	15.56	60.4	16.99	58.8	0.34	11.0	-	-	0.34
	91	3.81	28.34	32.15	3.81	100.0	28.34	100.0	32.15	100.0	3.05	80.0	7.09	25.0	10.14
Punjab	1981	4.21	11.85	16.06	3.05	72.3	2.38	20.1	5.43	33.8	1.64	38.9	-	-	1.64
	85	4.64	12.38	17.02	3.50	75.4	3.05	24.6	6.55	38.5	2.46	53.0	0.10	0.8	2.56
	91	5.31	13.08	18.39	5.31	100.0	13.08	100.0	18.39	100.0	4.25	80.0	3.27	25.0	7.52
Rajasthan	1981	6.16	27.28	33.46	4.06	65.7	9.89	36.3	13.95	41.7	0.30	4.8	-	-	0.30
	85	6.82	29.90	36.72	6.82	100.0	20.39	68.2	27.21	74.1	1.01	14.8	0.40	1.4	1.41
	91	8.07	33.54	41.61	8.07	100.0	33.54	100.0	41.61	100.0	6.46	80.0	8.39	25.0	15.85
Sikkim	1981	0.11	0.20	0.31	0.03	27.3	0.05	25.0	0.08	25.8	-	-	-	-	-
	85	0.14	0.21	0.35	0.10	71.4	0.18	85.7	0.28	80.0	0.07	50.0	0.02	9.5	0.09
	91	0.18	0.22	0.40	0.18	100.0	0.22	100.0	0.40	100.0	0.14	77.8	0.06	27.3	0.20
Tamil Nadu	1981	15.92	31.38	47.30	12.90	81.0	6.46	20.6	19.36	40.9	7.40	46.5	0.06	0.2	7.46
	85	17.27	32.04	49.31	14.62	84.7	12.67	39.5	27.29	55.3	7.94	46.0	0.86	2.7	8.80
	91	19.77	33.25	53.02	19.77	100.0	33.25	100.0	53.02	100.0	15.82	80.0	8.30	25.0	24.12
Tripura	1981	0.27	1.84	2.11	0.11	38.9	0.74	40.3	0.85	40.1	0.01	3.7	-	-	0.01
	85	0.31	2.02	2.33	0.21	67.7	1.62	80.2	1.83	78.5	0.02	6.5	0.01	0.5	0.03
	91	0.41	2.34	2.75	0.41	100.0	2.34	100.0	2.75	100.0	0.33	80.5	0.59	25.2	0.92
Uttar Pradesh	1981	15.76	89.98	105.74	13.99	88.8	6.49	7.2	20.48	19.4	2.56	16.3	-	-	2.56
	85	17.19	95.45	112.64	15.03	87.4	30.95	32.4	45.98	40.8	6.38	37.1	-	-	6.38
	91	19.34	102.77	122.11	19.34	100.0	102.77	100.0	122.11	100.0	15.47	80.0	25.69	25.0	41.16
West Bengal	1981	15.15	40.78	55.93	8.67	57.2	6.44	15.8	15.11	27.0	2.24	14.8	-	-	2.24
	85	16.87	43.40	60.27	10.03	59.5	25.45	58.6	35.48	58.9	2.70	16.0	0.20	0.5	2.90
	91	16.24	50.25	66.49	16.24	100.0	50.25	100.0	66.49	100.0	13.00	80.0	12.56	25.0	25.56
A & N Islands	1981	0.05	0.14	0.19	0.05	100.0	0.08	55.0	0.13	63.7	0.02	48.0	-	-	0.02
	85	0.06	0.17	0.23	0.05	83.4	0.16	94.1	0.21	91.3	0.02	50.0	0.01	5.9	0.03
	91	0.07	0.21	0.28	0.07	100.0	0.21	100.0	0.28	100.0	0.05	71.4	0.05	23.8	0.10
Arunachal Pradesh	1981	0.03	0.61	0.64	0.02	83.4	0.39	64.3	0.41	65.2	0.02	73.4	-	-	0.02
	85	0.04	0.67	0.71	0.03	95.0	0.67	100.0	0.70	98.6	0.03	75.0	0.13	19.4	0.16
	91	0.04	0.79	0.83	0.04	100.0	0.79	100.0	0.83	100.0	0.03	75.0	0.20	25.3	0.23
Chandigarh	1981	0.51	0.01	0.52	0.48	94.1	-	-	0.48	92.3	0.48	94.1	-	-	0.48
	85	0.65	0.01	0.66	0.58	89.2	-	-	0.58	87.9	0.58	89.3	-	-	0.58
	91	0.95	-	0.95	0.95	100.0	-	-	0.95	100.0	0.95	100.0	-	-	0.95
Dadra & N.Haveli	1981	-	0.09	0.09	-	-	0.04	44.5							

State/UT	WATER SUPPLY				SANITATION				Grand Total
	Urban		Rural	Total	Urban		Rural	Total	
	New	Augment- ation			New	Augment- ation			
Andhra Pradesh	200.49	99.51	428.16	728.16	249.69		57.15	306.84	1,035.00
Assam	82.49		342.34	424.83	62.31		28.71	91.02	515.85
Bihar	63.42	55.10	351.52	470.04	158.13		75.11	233.24	703.28
Gujarat	64.98	82.24	159.19	306.41	137.07	94.57	33.22	264.86	571.27
Haryana	68.89		225.16	294.05	50.93		14.95	65.88	359.94
Himachal Pradesh	4.02	7.23	91.31	102.56	8.51		5.69	14.20	116.76
Jammu & Kashmir	19.52	45.14	167.97	232.63	85.00		7.32	92.32	324.95
Karnataka	65.09	223.27	278.39	566.75	129.54	48.51	36.18	214.23	780.98
Kerala	107.07		268.89	375.96	155.63		29.90	185.53	561.49
Madhya Pradesh	171.64		525.60	697.24	287.49		65.46	352.95	1,050.19
Maharashtra	195.11	190.49	632.69	1,018.29	392.94	163.58	55.43	611.95	1,630.24
Manipur	17.98		38.10	56.08	22.56		1.55	24.11	80.19
Meghalaya	29.64		49.15	78.79	13.71		1.66	15.37	94.16
Nagaland	14.42		15.53	29.95	9.86		.80	10.66	40.61
Orissa	86.76		188.65	275.41	76.12		35.42	111.54	386.95
Punjab	78.44	25.70	224.22	328.36	88.62	13.53	16.35	118.50	446.86
Rajasthan	88.04		399.17	487.21	191.98		41.92	233.90	721.11
Sikkim	10.52	1.20	10.38	22.10	6.54		.27	6.81	28.91
Tamilnadu	191.50	192.02	518.39	901.91	201.15	61.29	41.28	303.72	1,205.63
Tripura	10.94		29.17	40.11	13.96		2.93	16.89	57.00
Uttar Pradesh	102.35	104.90	996.13	1,203.38	271.89	34.59	128.46	434.94	1,638.32
West Bengal	146.75	115.49	501.43	763.67	506.37		62.81	569.18	1,332.85
A & N Island	1.21		5.81	7.02	1.35		.26	1.61	8.63
Arunachal Pradesh	.90		15.02	15.92	.52		.99	1.51	17.43
Chandigarh	25.96	11.88		37.84	17.23	6.48		23.71	61.55
Delhi	114.80		4.79	119.59	162.43		.69	163.12	282.71
Dadra & Nagar Haveli			.67	.67			.13	.13	.80
Goa, Daman & Diu	25.87		17.42	43.29	14.70		.98	15.68	58.97
Lakshadweep			2.25	2.25			.50	.50	2.75
Mizoram	2.88		35.18	38.06	2.01		.57	2.58	40.64
Pondicherry	4.28		2.35	6.63	3.95		.52	4.47	11.10
Total	1,995.96	1,154.17	6,525.03	9,675.16	3,322.19	422.55	747.21	4,491.95	14,167.11

POPULATION COVERAGE AND FINANCIAL TARGETS

PHASE I

1. Physical target
(Population in millions)

2. Financial Target
(Cost Rs. in millions)

Name of State/U.T.	Water Supply				Sanitation			
	Urban		Rural		Urban		Rural	
1. Andhra Pradesh	.51	633.96	11.25	1,182.27		59.54	.75	80.00
2. Assam	.40	119.70	4.62	437.94	.12	14.80		
3. Bihar	.59	174.60	15.14	824.72	.14	32.83		
4. Gujarat	1.32	305.26	8.91	960.90	3.23	650.80	.05	2.30
5. Haryana	.45	152.63	3.26	783.34	.29	68.78	.10	5.00
6. Himachal Pradesh ¹	.04	50.42	1.20	620.01	.02	10.00		
7. Jammu & Kashmir	.10	245.70	1.13	611.50	.10	75.00	.10	16.00
8. Karnataka	.36	454.50	4.96	654.12	.43	107.00		
9. Kerala	.27	216.95	2.57	671.41	.15	94.18	.08	16.03
10. Madhya Pradesh	1.96	320.60	6.15	1,068.05		25.17	.05	2.48
1. Maharashtra ¹	3.60	2,100.50	10.50	2,681.50	4.40	1,253.00		
2. Manipur	.20	36.49	.56	215.50	.02	4.30	.01	.50
3. Meghalaya	.23	180.97	.29	291.66		5.00	.01	1.00
4. Nagaland	.02	33.96	.27	110.00	.01	2.94	.02	1.00
5. Orissa	.36	81.65	7.71	646.12	.05	13.70		
6. Punjab	.45	212.70	.67	294.16	.82	332.60	.10	5.00
7. Rajasthan ¹	3.08	684.50	10.5	1,341.60	.71	139.50		
8. Sikkim ¹	.07	31.20	.22	103.75	.06	21.50	.02	.90
9. Tamil Nadu	1.72	1,235.76	6.21	1,861.70	.54	313.38	.80	40.00
10. Tripura	.10	32.90	.88	124.65	.01	9.00	.01	.50
1. Uttar Pradesh ¹	1.04	848.77	24.46	3,144.88	3.82	221.05		
2. West Bengal	1.36	677.12	19.01	871.77	.46	93.44	.21	10.50
3. A & N Islands	.01	6.94	.08	38.31		.90	.01	.52
4. Arunachal Pradesh ¹	.02	9.00	.36	142.00	.01	1.75	.13	6.29
5. Chandigarh	.10	92.60			.10	28.75		
6. Delhi ¹	1.60	296.50	.27	55.00	1.30	632.90		
7. Dadra & Nagar Haveli			.05	6.18				
8. Goa, Daman & Diu ¹	.50	141.23	.17	42.16	.09	15.95	.01	.65
9. Lakshadweep ¹			.01	1.40				.40
10. Mizoram	.03	11.47	.08	70.97	.02	13.60	.03	1.00
1. Pondicherry	.06	16.90	.13	18.51	.02	11.51		
Total	20.10	9,405.48	141.62	19,876.08	16.92	4,252.87	2.49	190.08

¹ Tentative

RURAL WATER SUPPLY—PROBLEM VILLAGES

Statement Showing Criteria-wise break-up of Problem Villages

Sl. No.	States/UTs	Criteria I	Criteria II	Criteria III	Total
1.	Andhra Pradesh	5217	2355	634	8206
2.	Assam	4467	9740	1536	15743
3.	Bihar	NA	NA	NA	15194
4.	Gujarat	4219	1099	NIL	5318
5.	Haryana	952	2488	NIL	3440
6.	Himachal Pradesh	7815	NIL	NIL	7815
7.	Jammu & Kashmir	4672	NIL	26	4698
8.	Karnataka	13352	1936	168	15456
9.	Kerala	1011	122	25	1158
10.	Madhya Pradesh	24909	21	14	24944
11.	Maharashtra	11220	841	874	12935
12.	Manipur	1178	NIL	34	1212
13.	Meghalaya	2927	NIL	NIL	2927
14.	Nagaland	570	78	1	649
15.	Orissa	15420	2499	5697	23616
16.	Punjab	367	1400	NIL	1767
17.	Rajasthan	9321	7009	3473	19803
18.	Sikkim	296	NIL	NIL	296
19.	Tamil Nadu	3981	1343	1325	6649
20.	Tripura	681	1097	1022	2800
21.	Uttar Pradesh	19237	1649	7619	28505
22.	West Bengal	12818	9360	3065	25243
23.	A & N Islands	154	19	NIL	173
24.	Arunachal Pradesh	1239	NIL	501	1740
25.	Chandigarh	—	—	—	—
26.	Delhi	NIL	99	—	99
27.	Dadra & Nagar Haveli	—	—	—	—
28.	Goa, Daman & Diu	58	8	NIL	66
29.	Lakshadweep	—	—	—	—
30.	Mizoram	214	NIL	NIL	214
31.	Pondicherry	74	44	NIL	118
		146,360	43,207	26,014	230,784

TARGET POPULATION FOR WATER SUPPLY AND SANITATION COVERAGE

1981-91

Appendix I
Table 4B

(POPULATION IN THOUSANDS)

WATER SUPPLY

SANITATION

STATE/UNION TERRITORY	URBAN	RURAL	AUG- MENTATION URBAN	URBAN	RURAL	AUG- MENTATION URBAN
1. Andhra Pradesh	7362	28982	5433	10016	11430	
2. Assam	2629	20170		2222	5741	
3. Bihar	2326	27606	2624	6633	15022	
4. Gujarat	3253	10535	6651	5776	6645	4368
5. Haryana	2012	9200		2165	2990	
6. Himachal Pradesh	121	2746	325	312	1138	
7. Jammu & Kashmir	471	4123	1223	1257	1464	
8. Karnataka	2629	20945	9337	6115	7236	3518
9. Kerala	3216	18265		4550	5979	
10. Madhya Pradesh	6666	39328		10470	13091	
11. Maharashtra	6614	36714	10900	13572	11087	7573
12. Manipur	429	973		552	310	
13. Meghalaya	264	1113		262	332	
14. Nagaland	254	310		256	160	
15. Orissa	2735	20478		2755	7085	
16. Punjab	2267	10699	2747	2612	3271	1505
17. Rajasthan	4010	23643		6157	8384	
18. Sikkim	154	171	24	143	54	
19. Tamil Nadu	6139	26530	9983	7281	8255	2884
20. Tripura	304	1601		326	586	
21. Uttar Pradesh	5350	96285	8562	12910	25692	2562
22. West Bengal	7576	43302	8665	10750	12563	
23. A & N Islands	23	131		30	52	
24. Arunachal Pradesh	18	394		12	197	
25. Chandigarh	472		480	472		480
26. Delhi	3873	266		4878	138	
27. Dadra & Nagar Haveli		64			26	
28. Goa, Daman & Diu	398	621		526	197	
29. Lakshadweep		37			10	
30. Mizoram	74	339		67	113	
31. Pondicherry	128	161		121	104	
TOTAL	71767	445732	66954	113198	149352	22890

ESTIMATED ANNUAL YIELD FROM SPECIAL PURPOSE CESS
TO BE LEVIED ON LAND REVENUE

Sl. No.	*Size class of household ownership (in acres)	*Total Estimated area owned (in 000 acres)	Rate as % of land revenue	Rate Rs. per acre	Amount likely to be realised. (Rs. crores)
1	2	3	4	5	6
1.	0 — 1.25	10,000	50.0	3.0	21.90
2.	1.25 — 2.5	19,182			
3.	2.5 — 5.0	43,887			
4.	5.0 — 7.5	37,988	100.0	6.0	39.00
5.	7.5 — 10.0	27,564			
6.	10.0 — 15.0	43,598	150.0	9.0	63.90
7.	15.0 — 20.0	27,708			
8.	20.0 and above	89,163	200.0	12.0	106.80
Total .		2,99,090			231.6

*Source NSS—26th round (1971-72)

N.B.—Average rate of land revenue has been assumed to be Rs. 6 per acre (for all size groups) as indicated in the Fifth Five year Plan.

SECTOR INVESTMENT
CONTRIBUTION BY VARIOUS AGENCIES

Sl. No	State/U.T.	Urban Water Supply and Sewerage		Rural Water Supply and Sewerage		Remarks
		Central or State Govt.	Local bodies	Central or State Govt.	Local bodies	
1	2	3	4	5	6	7
1.	Andhra Pradesh	33.3%	65.7% (LIC loan to the local bodies)	Major portion as grant from State Govt.	Partially financed by the local bodies.	
2.	Assam	Nil (Except 3 hill districts)	100%	100%	Nil	3 hill districts. State Govt. contribute 100% for urban water supply & sewerage schemes.
3.	Bihar	Water Supply 25% Grant-in-Aid 75% loans	Water Supply Nil	Water Supply 100%	Water Supply Nil	Loans are repayable over a period of 30 years.
		Sewerage 50% Grant-in-Aid 50% Loans	Sewerage Nil	Sewerage	Sewerage	
4.	Gujarat	Water Supply Grant 20 to 35% (depending upon the population)	Water Supply to 65% (depending upon the population)	Water Supply 100%	Water Supply Nil	Four city corporations borrow loans from LIC/Commercial Banks also.
		Sewerage Grant 35% to 55% (depending upon the population)	Sewerage 45% to 65% (depending upon the population)	Sewerage 100%	Sewerage Nil	
5.	Haryana	(a) Grant/Loans 95% (including LIC loans)	5%	Grant 88%	12% (through beneficiaries)	
		(b) Grant/Loans 95% (No LIC loan)	5%			
6.	Himachal Pradesh	100%	Nil	100%	Nil	Water Supply scheme except Simla Water supply scheme.
		25%	75%			In case of Simla W/S scheme only.
		100%	Nil	100%	Nil	Sewerage schemes
7.	Jammu & Kashmir	100%	Nil	100%	Nil	
8.	Karnataka	90% (a)	10% (a)	100%	Nil	(a) For town less than 20,000 population.
		33.3% (b)	66.7% (b)			(b) For town with more than 20,000 population - LIC loan to the concerned municipalities.

1	2	3	4	5	6	7
9. Kerala	50%	50%	75%	25% (as loan from State Govt.)		
10. Madhya Pradesh	100%	Nil	N.A.	N.A.		For Urban W/S schemes in towns having population below 20000.
	80%	20%	-	-		For urban W/S schemes in towns having more than 20000 population.
11. Maharashtra	Govt. Grant 23½% to 50% (depending upon the size of the community) LIC loans 40% to 66½%	10% (Beneficiaries)	Govt. Grant 90% (of which max. upto 50% may be from LIC as loan)	10% (Beneficiaries)		
12. Manipur	100%	Nil	100%	Nil		
13. Meghalaya	N.A.	N.A.	N.A.	N.A.		Asked for from State Deptt.
14. Nagaland	100%	Nil	100%	Nil		
15. Orissa	Water Supply (a) 33.33% (b) 100% (In case of Govt. residential colonies or public sector undertakings)	Water Supply 66.67% Nil	Water Supply 100%	Water Supply Nil		
	Sewerage N.A.	Sewerage N.A.	Sewerage N.A.	Sewerage N.A.		
16. Punjab	65%	15% Investment 20% as loan from Govt.	100% (Excepting cost of land)	Land is contributed.		
17. Rajasthan	Govt. Grant Nil Govt. Loans 100%	Nil Nil	Grant 97.5%	2.5%		
18. Sikkim	100%	Nil	100%	Nil		
19. Tamil Nadu	100%	Nil	70%	30%		
20. Tripura	57.5%	42.5%	100%	Nil		For urban W.S.S. the State Govt. gives 100% excepting Agartala Municipal water supply schemes. The percentage contribution shown in Cols. 3 & 4.
21. Uttar Pradesh	75%	25%	N.A.	N.A.		For urban water supply schemes.

1	2	3	4	5	6	7
22.	West Bengal . . .	66.67%	33.33%	100%	Nil	For urban water supply and sewerage schemes within CMD Area 100% grant-in-aid. The contribution of local bodies are generally written off.
23.	A&N Islands . . .	—	—	—	—	
24.	Arunachal Pradesh . . .	N.A.	N.A.	N.A.	N.A.	Asked for from the U.T. Deptt.
25.	Chandigarh . . .	100%	—	—	—	
26.	Delhi	100%	Nil	100%	Nil	
27.	Dadra & Nagar Haveli	N.A.	N.A.	N.A.	N.A.	
28.	Goa, Daman & Diu	100%	—	100%	—	
29.	Lakshadweep . . .	100%	Nil	100%	Nil	
30.	Mizoram	100%	Nil	100%	Nil	
31.	Pondicherry	100%	Nil	100%	Nil	

Note : N.A. :—Information not available at present.

PROFESSIONAL AND TECHNICAL PERSONNEL^e
PRESENT POSITION AND REQUIREMENTS

Abstract for the whole country

Manpower category	Number in position as on 31-3-81	Number required on 31-3-85 (end of VI Plan)	Number required on 31-3-91 (end of Decade)	Addl. requirement		
				During VI Plan 1-4-81 to 31-3-85	During 1-4-85 to 31-3-91	
1	2	3	4	5	6(4-3)	7(5-4)
<i>Professional</i>						
Engineers (Degree)	9 775	18 850	28 675	9 075	9 825	
Engineers (Diploma)	15 775	30 745	52 775	14 990	22 030	
Economist/Financial Analyst	14	83	114	70	29	
Accountants (Div)	1 160	2 251	3 503	1 091	1 252	
Social Scientists/Health Educators	10	361	562	351	201	
Sanitary Chemists/Biologists	181	425	660	244	235	
Hydrogeologists/Geologists	72	192	249	120	57	
<i>Technicians</i>						
Draughtsman	4 480	9 957	15 901	5 447	5 944	
Plant Operators	10 423	22 550	47 840	12 127	25 290	
Mechanics/Electricians	6 243	14 379	27 769	8 136	13 390	
Fitters/Plumbers	6 870	16 842	31 235	9 972	14 393	
Drillers	1 010	2 136	3 105	1 126	969	
Lab. Technicians	168	832	1 403	664	571	

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

PROFESSIONALS

Engineers (Degree)

Engineers (Diploma)

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	812	1768	3170	537	1537	3040
2.	Assam	126	350	1050	163	600	1800
3.	Bihar	426	550	763	910	1400	1882
4.	Gujarat	457	730	960	416	660	900
5.	Haryana	133	427	436	400	1280	1296
6.	Himachal Pradesh	88	110	140	339	419	519
7.	Jammu & Kashmir	174	394	434	217	500	750
8.	Karnataka	859	1698	1910	649	1236	1360
9.	Kerala	591	900	1000	308	1100	1200
10.	Madhya Pradesh	484	571	2380	2053	2425	10090
11.	Maharashtra	1165	1898	2400	1623	2623	4000
12.	Manipur	55	125	125	160	364	364
13.	Meghalaya	76	110	144	193	230	272
14.	Nagaland	13	38	38	42	106	130
15.	Orissa	217	336	1740	440	704	3652
16.	Punjab	307	635	871	781	1787	2306
17.	Rajasthan	711	1500	2550	593	1320	2400
18.	Sikkim	27	35	70	71	84	96
19.	Tamil Nadu	1136	2220	2700	490	739	931
20.	Tripura	21	87	87	82	135	160
21.	Uttar Pradesh	1245	2270	3360	3300	4370	9700
22.	West Bengal	374	1370	1370	1259	3586	3586
23.	A & N Islands	20	33	33	18	30	30
24.	Arunachal Pradesh	25	47	125	119	199	600
25.	Chandigarh	31	51	56	84	160	176
26.	Delhi	164	260	380	384	780	1140
27.	Dadra & Nagar Haveli						
28.	Goa, Daman & Diu	28	250	308	21	175	226
29.	Lakshadweep	1	3	4	2	6	12
30.	Mizoram	8	49	49	44	169	169
31.	Pondicherry	10	46	62	23	50	70
		9777	18851	28675	15753	30144	52777

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

PROFESSIONALS

Financial Analysts

Accountants

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	..	14	14	51	155	305
2.	Assam	..	1	2	17	51	151
3.	Bihar	..	1	1	72	90	141
4.	Gujarat	1	2	2	38	52	58
5.	Haryana	..	4	6	25	80	81
6.	Himachal Pradesh	..	1	1	26	39	43
7.	Jammu & Kashmir	1	10	11	25	55	62
8.	Karnataka	2	2	6	96	160	190
9.	Kerala	2	4	5	35	80	100
10.	Madhya Pradesh	..	1	2	72	93	355
11.	Maharashtra	..	2	2	57	137	252
12.	Manipur	..	1	1	9	17	17
13.	Meghalaya	..	1	1	11	33	43
14.	Nagaland	1	1	1	7	10	10
15.	Orissa	1	2	8	23	32	165
16.	Punjab	..	3	3	86	145	187
17.	Rajasthan	1	7	10	75	139	200
18.	Sikkim	..	1	1	7	7	9
19.	Tamil Nadu	2	6	9	131	185	227
20.	Tripura	..	1	1	3	20	20
21.	Uttar Pradesh	2	6	12	193	323	462
22.	West Bengal	1	5	5	62	240	242
23.	A & N Islands	..	..	..	2	3	3
24.	Arunachal Pradesh	..	1	1	2	4	25
25.	Chandigarh	..	1	1	6	10	11
26.	Delhi	..	2	1	24	65	95
27.	Dadra & Nagar Haveli	..	..	..	..	..	..
28.	Goa, Daman & Diu	..	1	1	1	15	25
29.	Lakshadweep	..	..	1	..	..	2
30.	Mizoram	..	1	1	6	18	18
31.	Pondicherry	..	1	1	1	3	1
		14	83	114	1160	2251	3563

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

PROFESSIONALS

Social Scientists/-
Health EducatorsSanitary Chemists/
Biologists

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	..	8	23	..	12	17
2.	Assam	..	5	10	..	5	10
3.	Bihar	..	93	141	3	23	35
4.	Gujarat	..	10	15	25	43	55
5.	Haryana	..	5	5	3	19	43
6.	Himachal Pradesh	..	1	2	4	6	10
7.	Jammu & Kashmir	..	50	62	..	25	31
8.	Karnataka	..	19	19	20	32	41
9.	Kerala	..	12	12	1	10	15
10.	Madhya Pradesh	..	9	45	8	9	35
11.	Maharashtra	..	12	25	8	24	32
12.	Manipur	..	2	2	2	4	4
13.	Meghalaya	..	3	3	9	9	10
14.	Nagaland	..	2	2	..	2	3
15.	Orissa	..	6	13	1	6	13
16.	Punjab	..	9	14	1	11	13
17.	Rajasthan	..	15	26	8	18	26
18.	Sikkim	..	2	4	..	4	4
19.	Tamil Nadu	..	23	26	11	30	40
20.	Tripura	..	2	2	..	3	4
21.	Uttar Pradesh	3	13	25	12	30	50
22.	West Bengal	6	40	50	5	20	36
23.	A & N Islands	..	2	2	..	2	2
24.	Arunachal Pradesh	..	10	18	..	5	11
25.	Chandigarh	1	1	2	2	2	2
26.	Delhi	..	..	..	45	57	87
27.	Dadra & Nagar Haveli	..	..	..	..	..	..
28.	Gon, Daman & Diu	..	2	5	..	4	5
29.	Lakshdweep	..	..	1	..	1	1
30.	Mizoram	..	6	6	1	4	5
31.	Pondicherry	..	2	2	..	2	2
		10	361	562	181	425	660

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

PROFESSIONALS

Hydrogeologists/Geologists

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	1	9	20
2.	Assam	..	1	1
3.	Bihar	3	10	20
4.	Gujarat	18	35	52
5.	Haryana	..	3	4
6.	Himachal Pradesh	1	2	2
7.	Jammu & Kashmir	..	2	4
8.	Karnataka	11	46	47
9.	Kerala	3	7	7
10.	Madhya Pradesh	1	9	9
11.	Maharashtra	20	24	27
12.	Manipur	..	1	2
13.	Meghalaya	1	2	2
14.	Nagaland	..	1	1
15.	Orissa	1	1	4
16.	Punjab	..	2	2
17.	Rajasthan	3	6	10
18.	Sikkim	..	1	1
19.	Tamil Nadu	8	18	20
20.	Tripura	..	1	1
21.	Uttar Pradesh	..	2	2
22.	West Bengal	1	5	5
23.	A&N Islands	..	1	1
24.	Arunachal Pradesh	..	1	2
25.	Chandigarh	..	..	..
26.	Delhi	..	..	..
27.	Dadra & Nagar Haveli	..	..	..
28.	Goa, Daman & Diu	..	1	1
29.	Lakshadweep	..	..	1
30.	Mizoram	..	..	..
31.	Pondicherry	..	1	1
		72	192	249

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

TECHNICIANS

Plant Operators

Draughtsman

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	109	3240	8035	154	705	1736
	Assam	—	160	300	21	100	300
3.	Bihar	120	200	400	277	400	630
4.	Gujarat	496	610	750	120	250	400
5.	Haryana	1600	3770	7785	111	364	358
6.	Himachal Pradesh	10	15	35	200	270	300
7.	Jammu & Kashmir	41	300	500	88	350	450
8.	Karnataka	462	1371	4500	220	300	400
9.	Kerala	1900	2800	4500	573	1700	1850
10.	Madhya Pradesh	215	622	1520	617	736	3050
11.	Maharashtra	423	510	600	99	163	300
12.	Manipur	150	160	180	65	80	80
13.	Meghalaya	15	22	34	16	24	38
14.	Nagaland	..	10	10	10	20	25
15.	Orissa	10	16	80	41	70	370
16.	Punjab	1624	3294	5298	187	437	622
17.	Rajasthan	1010	2480	4960	137	474	532
18.	Sikkim	..	240	270	7	54	54
19.	Tamil Nadu	711	830	1320	547	1575	1950
7.	Tripura	4	6	26	60	68	70
21.	Uttar Pradesh	591	1500	5000	605	990	1400
22.	West Bengal	93	324	330	123	240	240
23.	A&N Islands	17	42	92	2	9	9
24.	Arunachal Pradesh	—	4	25	30	46	110
25.	Chandigarh	513	476	400	15	30	33
26.	Delhi	175	230	500	100	195	285
27.	Dadra & Nagar Haveli						
28.	Goa, Daman & Diu	130	360	360	40	250	250
29.	Lakshadweep	..	2	4	..	1	2
30.	Mizoram	2	6	6	7	29	29
31.	Pondicherry	2	10	20	7	27	31
		10423	22550	47840	4480	9957	15904

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

TECHNICIANS

Mechanics/Electricians

Fitters/Plumbers

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	753	3380	8315	156	3310	8109
2.	Assam	20	100	300	30	100	300
3.	Bihar	1120	2000	2900	1650	1900	3200
4.	Gujarat	183	320	400	200	280	350
5.	Haryana	326	770	1585	400	940	1950
6.	Himachal Pradesh	..	6	16	180	210	240
7.	Jammu & Kashmir	80	200	320	65	300	480
8.	Karnataka	575	1148	1330	150	223	420
9.	Kerala	50	90	150	130	230	400
10.	Madhya Pradesh	97	423	150	81	733	2180
11.	Maharashtra	200	300	400	183	250	325
12.	Manipur	30	155	340	250	525	985
13.	Meghalaya	48	48	62	..	44	77
14.	Nagaland	6	12	20	50	62	70
15.	Orissa	354	540	2820	79	128	660
16.	Punjab	187	271	651	190	321	725
17.	Rajasthan	154	850	1300	674	2748	4681
18.	Sikkim	50	415	150	500	1200	1500
19.	Tamil Nadu	469	705	1070	498	640	1000
20.	Tripura	10	50	70	100	150	200
21.	Uttar Pradesh	215	610	1400	200	810	1400
22.	West Bengal	690	830	900	817	1200	1214
23.	A&N Islands	4	10	12	24	30	40
24.	Arunachal Pradesh	..	9	50	80	200	500
25.	Chandigarh	9	10	12	59	75	95
26.	Delhi	535	740	1500	..	..	..
27.	Dadra & Nagar Haveli	2	8	8	..	2	2
28.	Goa, Daman & Diu	43	72	26	37	240	480
29.	Lakshadweep	..	1	4	..	1	4
30.	Mizoram	5	40	50	36	120	120
31.	Pondicherry	30	42	60	51	70	100
		6243	14379	27769	6870	16842	31235

REQUIREMENT OF MANPOWER FOR THE DECADE (1981-90)

TECHNICIANS

Laboratory

Well Drillers

Sl. No.	Name of the State	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91	As on 31-3-81 (Existing)	As on 31-3-85	As on 31-3-91
1.	Andhra Pradesh	2	34	83	122	174	252
2.	Assam	..	5	10	20	50	84
3.	Bihar	30	40	70	45	60	140
4.	Gujarat	17	60	80	39	85	100
5.	Haryana	2	14	32	13	44	38
6.	Himachal Pradesh	4	5	10	..	2	5
7.	Jammu & Kashmir	..	45	60	6	30	36
8.	Karnataka	11	38	82	260	340	420
9.	Kerala	..	32	60	35	50	50
10.	Madhya Pradesh	6	21	135	161	450	830
11.	Maharashtra	6	124	124	78	280	280
12.	Manipur	3	12	12	..	4	4
13.	Meghalaya	..	6	7	7	12	12
14.	Nagaland	1	6	8	..	2	2
15.	Orissa	1	24	51	27	48	250
16.	Punjab	3	41	47	12	37	88
17.	Rajasthan	23	103	108	9	106	145
18.	Sikkim	..	14	16	..	30	36
19.	Tamil Nadu	9	24	45	72	124	134
20.	Tripura	4	6	8	8	15	18
21.	Uttar Pradesh	..	60	120	53	65	80
22.	West Bengal	15	30	45	43	80	80
23.	A&N Islands	..	8	8	..	4	4
24.	Arunachal Pradesh	..	4	10	..	1	7
25.	Chandigarh	..	2	2	..	..	..
26.	Delhi	30	50	140	..	..	..
27.	Dadra & Nagar Haveli	..	..	..	..	..	..
28.	Goa, Daman & Diu	..	6	16	..	4	4
29.	Lakshdweep	..	4	4	..	..	..
30.	Mizoram	1	4	4	..	..	..
31.	Pondicherry	..	4	6	..	6	6
		168	832	1403	1010	2136	3105

EDUCATION INSTITUTIONS
CIVIL ENGINEERING DEGREE COURSE

Region/State/UT and No. of Institutions	Sanctioned intake	Present Intake	Actual Admission	Out-turn
<i>Northern Region</i>				
1. Chandigarh (1)	75	55	55	53
2. Delhi (2)	180	155	155	62
3. Haryana (1)	65	65	70	54
4. J & K (1)	70	90	90	46
5. Punjab (2)	120	120	124	116
6. Rajasthan (3)	220	164	129	123
7. U.P. (9)	360	360	378	344
<i>Eastern Region</i>				
8. Assam (3)	165	165	170	66
9. Bihar (6)	350	285	60	263
10. Orissa (2)	150	65	48	70
11. Tripura (1)	40	33	32	20
12. West Bengal (5)	420	275	355	184
<i>Western Region</i>				
13. Gujarat (5)	630	630	643	488
14. M. P. (9)	500	500	505	368
15. Maharashtra (9)	626	626	624	607
Goa (1)	32	32	32	25
<i>Southern Region</i>				
17. Andhra Pr. (8)	348	593	590	374
18. Kerala (6)	360	370	388	260
19. Tamilnadu (10)	645	775	805	496
20. Karnataka (18)	500	1829	1831	636
Total (102)	5856	7177	7082	4652

EDUCATIONAL INSTITUTIONS
CIVIL ENGINEERING DIPLOMA COURSE

Name of State & No. of Institutions	Sanctioned intake	Present intake	Actual Admission	Out-turn
<i>Northern Region</i>				
Delhi (3)	215	211	211	140
Himachal Pradesh (2)	152	72	75	67
Jammu & Kashmir (2)	200	200	234	15
Punjab (8)	440	438	411	248
Chandigarh (1)	80	80	75	51
Haryana (6)	450	426	483	266
Rajasthan (5)	330	240	250	221
Uttar Pradesh (30)	1620	1685	1611	1224
<i>Eastern Region</i>				
West Bengal (18)	1470	998	1029	673
Bihar (11)	880	530	—	240
Orissa (3)	360	315	327	81
Assam (5)	480	492	519	319
Meghalaya (1)	60	60	63	34
Manipur (1)	30	60	60	52
Nagaland (1)	30	25	25	—
Tripura (1)	60	40	44	41
<i>Western Region</i>				
Goa (1)	40	40	50	21
Gujarat (13)	1060	1060	1182	730
Madhya Pradesh (19)	1355	1355	1328	1129
Maharashtra (21)	1350	1350	1350	1220
<i>Southern Region</i>				
Andhra Pradesh (21)	860	916	967	616
Karnataka (23)	990	1012	1026	544
Kerala (14)	765	672	651	350
Tamilnadu (23)	1185	1379	1388	804
Pondicherry (1)	60	30	30	12
Total : (234)	14522	13686	13389	9018

STATEMENT OF P.G. COURSES IN ENVIRONMENTAL/PUBLIC HEALTH ENGINEERING*
INTAKE AND OUT-TURN

Place	Average for 75-76 to 77-78		Sanctioned intake
	Actual Intake	Out-turn	
1. I.I. Bombay, Environmental Science & Engineering <i>University Departments</i>	7	Continuing	7
2. M. S. University, Baroda, M. Tech., Public Health	6	4	8
3. Jadavpur University, M. Tech., P.H. Engg.	17 $\frac{17}{4} = 4$	3 $\frac{3}{4} = 1$	20 $\frac{20}{4} = 5$
4. Roorkee University, PH. Engg. M. Tech. (Environmental)	7	3	7
5. Banaras Hindu University	20 $\frac{20}{4} = 5$	8 $\frac{8}{4} = 2$	20 $\frac{20}{4} = 5$
6. M.B.M. Engg. College, Jodhpur University	3	—	10
7. Andhra University, Waltair	8	2	8
8. Visveswarayya College of Engg, Bangalore University	6	3	6
9. P. A. University of Tech, Madras	10	2	10
<i>Regional Engg. Colleges</i>			
10. Nagpur—PH Engg.	5	3	10
11. Allahabad Env. Enggt	10	5	20
12. Surat Env. Engg.	4	3	5
<i>State Govt. Colleges: PH Engg.</i>			
13. College of Engg. Trivandrum	2	1	6
14. L. D. College of Engineering, Ahmedabad	N.A.	N.A.	5
15. Govt. Engg. College, Jabalpur	5	3	7
16. Bengal Engg. College, Howrah	14 $\frac{14}{2} = 7$	9 $\frac{9}{2} = 4$	25 $\frac{25}{2} = 12$
17. Delhi College of Engg.	17 $\frac{17}{3} = 6$	7 $\frac{7}{2} = 3$	20 $\frac{20}{2} = 10$
<i>Non Government</i>			
18. V.J.T.I., Bombay	13	8	15
	108	47	156

†Not approved by PG Board.

††Sanctioned intake is assumed as actual intake.

* Source : Report of the Review Committee on Post Graduate Education & Research in Engineering & Technology) June 1980, Ministry of Education & Culture.

CLASSIFICATION OF TYPES OF PIPE AND
REQUIREMENTS FOR DECADE PROGRAMME

REQUIREMENT OF PLASTIC PIPE.

Year	Total requirement of plastic pipe		Diameterwise requirement (In Km)		
	(In Km)	(In Tonnes)	Upto 100 mm	110—200 mm.	250—500 mm.
1981-82	15008	20258	10806	4112	90
1982-83	16698	22546	12022	4575	101
1983-84	18576	25086	13374	5089	113
1984-85	28712	38764	20672	7867	173
Total during 4 years (1981—85)	78994	106654	56874	21643	477
Total during subsequent 6 years (1985—91)	184319	250301	132484	50532	1303
Grand total during the Decade (1981—91)	263313	356955	189358	72175	1780

Requirement of AC pressure pipe

Sl. No.	Dia in mm	Requirement for the Decade (1981—91)		Requirement for first 4 years (1981—85)		Requirement for remaining 6 years (1985—91)	
		Kms	MT	Kms	MT	Kms	MT
1	Upto 100	139238	976406	41769	292905	97469	683501
2	110 to 200	71791	982316	21533	294635	50258	687680
3	250 to 500	10374	481094	3113	144366	7261	336729
4	600 to 1000	338	34645	108	11071	230	23575
	TOTAL	221741	2474461	66523	742977	155218	1731485

Yearwise requirement of AC pressure pipe.

Sl. No.	Dia. in mm	1981-82		1982-83		1983-84		1984-85	
		km	MT	km	MT	km	MT	km	MT
1	Upto 100	7936	55651	8828	61906	9821	68870	15184	106478
2	110 to 200	4091	55977	4551	62271	5063	69277	7828	107110
3	250 to 500	591	27408	658	30515	732	33946	1132	52497
4	600 to 1000	21	2153	23	2357	25	2563	89	3998
	TOTAL	12639	141189	14060	157049	15641	174656	24183	270083

Requirement of G.I. pipe.

Year	Total Re- quirement (in km)	Diameterwise requirement	
		Upto to 100 mm	110 to 200 mm
1981-82	8601	8171	430
1982-83	9568	9089	479
1983-84	10644	10112	532
1984-85	16458	15635	823
Total during first four years (1981-85)	45271	43007	2264
Total during subsequent 6 years (1985-91)	105632	100427	5205
Grand total requirements during Decade (1981-91)	150903	143434	7469

Requirement of Stoneware pipe

Year	Total re- quirement (in km)	Diameterwise requirement		
		Upto 100 mm	110-200 mm	250-500 mm
1981-82	6478	3265	2770	443
1982-83	7207	3632	3082	493
1983-84	8018	4041	3428	549
1984-85	12390	6245	5298	847
Total during 1981-85	34093	17183	14578	2332
Total during 1985-91	79552	40094	34023	5435
Grand total during the Decade (1981-91)	113645	57277	48601	7767

Projected Demand of Cast Iron Spun Pressure Pipe. during the first four years of the Decade

Year	Sizes	80/100 mm	125/200 mm	250/500 mm	600/1000 mm	above 1000 mm	Total
1981-82	KM	1465	1619	1257	353	32	4726
	Mtrs.	1465000	1619000	1257000	353000	32000	4726000
	No. of Pipes	266363	294363	228545	64181	5818	859270
	Avg. Wt.	107 kg	210 kg	703 kg	2289 kg	5271 kg	
	*Total Wt.	98501	61816	160667	146910	30667	428561
1982-83	KM	1629	1802	1398	392	36	5257
	Mtrs.	1629000	1802000	1398000	392000	36000	5257000
	No. of Pipes	296181	327636	154181	71272	6545	955815
	Avg. Wt.	107 kg	210 kg	703 kg	2289 kg	5271 kg	
	*Total Wt.	31691	68804	178689	163141	34499	476824
1983-84	KM	1813	2004	1555	436	40	5848
	Mtrs.	1813000	2004000	1555000	436000	40000	5848000
	No. of Pipes	329636	364363	282727	79272	7273	1063271
	Avg. Wt.	107 kg	210 kg	703 kg	2289 kg	5271 kg	
	*Total Wt.	35271	76516	198757	181454	38336	530334
1984-85	KM	2802	3099	2405	674	60	9040
	Mtrs.	2802000	3099000	2405000	674000	60000	9040000
	No. of Pipes	509454	563464	437270	122545	10909	1643632
	Avg. Wt.	107 kg	210 kg	703 kg	2289 kg	5271 kg	
	*Total Wt.	54511	118325	307401	280505	57501	818245
Total During 1981-85	KM	7709	8524	6615	1854	168	24870
	Mtrs.	7709000	8524000	6615000	1854000	168000	24870000
	No. of Pipes	1401636	1549818	1202727	337090	30545	4621816
	Avg. wt.	107 kg	210 kg	703 kg	2289 kg	5271 kg	
	*Total wt.	149975	325462	845517	771599	161003	2253556

*Total weight in tonnes.

Projected demand for C.I. spun pressure pipe during 1985-86 to 1990-91 (6 years)

Particulars	80/100 mm	125/250 mm	250/500 mm	600/1000 mm	Above 1000 mm	Total
Projected demand in km	17,990	19,893	15,436	4,324	388	58,031
Metres	1,79,90,000	1,98,93,000	1,54,36,000	43,24,000	3,88,000	5,80,31,000
No. of Pipes	32,70,909	36,16,909	28,06,545	7,86,182	70,545	1,05,51,090
Average Wt. kg	107	210	7039	2,289	5,271	
Total weight in tonnes	3,49,987	7,59,551	19,73,001	17,99,571	3,71,848	52,53,953

Average requirement of pipes per year during 1985-86 to 1990-91 (six years) is 8,75,659 tonnes.

Cast iron spun pipe industry

(In Metric Tonnes)

Sl. No.	Names of Units	Licensed capacity	Installed capacity	Production 1979	Production 1980
1.	ISCO, Kulti	1,56,000	1,56,000	80,000	86,688
2.	ILSCO-Stanton	1,20,000	60,000	34,138	29,731
3.	Electrosteel	75,600	75,600	39,004	43,265
4.	Ke oram	45,000	45,000	19,866	26,980
5.	Gayday	30,000	30,000	..	..
6.	Shakti Pipes	50,000	50,000	..	..
7.	Andhra Foundry	36,000	36,000	..	..
8.	Visveswaraya Iron & Steel	18,000	18,000	..	..
9.	Indo Engg., Agra	24,000	24,000	..	..
10.	IDCOL-Kalinga	31,500	..	..	..
11.	Oriental Spun Pipe, Ballabgarh	24,000	..	..	..
12.	Sri T.P. Singh, Bihar	6,000	..	..	..
Total :		6,16,100	4,94,600	1,73,008	1,86,664

Requirement of R.C.C. Pipes.

Year	Total require- ment of R.C.C Pipes (In kms)	Diameterwise requiremt (In Km)				
		Upto 100 mm	110-200 mm	250-500 mm	600-100 mm	above 1000 mm
1981-82	2642	180	241	1866	331	24
1982-83	2939	200	268	2075	368	28
1983-84	3269	223	298	2308	409	31
1981-85	5056	345	461	3571	633	46
Total requirement during 4 yrs. (1981-85)	13906	948	1268	9880	1741	129
Total requirement during subse- quent 6 yrs. (1985-91)	32446	2212	2960	22914	4065	295
Grand Total requirement during the decade (1981-81)	46352	3160	4228	32734	5806	424

Requirement of Steel Pipe.

Year	Total require- ment of Steel pipes (In Km).	Diameter-wise requiremt (In Km.)				
		Upto 100 mm	100-200 mm	250-500 mm	600-1000 mm	above 1000 mm
1981-82	546	202	210	33	58	43
1982-83	607	225	233	38	64	47
1983-84	675	250	259	41	72	53
1984-85	1044	387	401	64	110	82
Total requirement during 4 Years (1981-85)	2872	1064	1103	176	304	225
Total requirement during subsequent 6 years. (1985-81)	6702	2487	2578	401	713	523
Grand Total requirement during the Decade (1981-81)	9574	3551	3681	577	1017	748

Requirement of P.S.C. Pipes

Year	Total require- ment of P.S.C. Pipes (in Km.)	Diameter-wise requirement (In Km.)				
		Upto 100 mm	110-200 mm.	250-500 mm.	600-1000 mm	above 10 00 mm.
1981-82	155	0.62	0.38	13	66	75
1982-83	172	0.69	0.31	15	73	83
1983-84	191	0.76	0.24	16	81	93
1984-85	208	1.19	0.81	25	126	145
Total requirement during 4 years (1981-85)	816	3.26	1.74	69	346	396
Total requirement during subsequent 6 years (1985-91)	1903	7.74	7.26	162	801	925
Grand total requirement during the decade (1981-91)	2719	11.00	9.00	231	1147	1321

RCC PIPE

REQUIREMENT DURING 1981-91

Appendix I
Table 18 A
Page 1 of 8

(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh	3143	758	459	266	89	4715
2. Assam			480	110		590
3. Bihar			472			472
4. Gujarat		660	986	290	65	2001
5. Haryana			11			11
6. Himachal Pradesh		100				100
7. Jammu & Kashmir	17	30	920	85	50	1102
8. Karnataka			285			285
9. Kerala			3000	50		3050
10. Madhya Pradesh			125	24	12	161
11. Maharashtra			13275	600	150	14025
12. Manipur			40			40
13. Meghalaya			68			68
14. Nagaland			50			50
15. Orissa			300			300
16. Punjab			70			70
17. Rajasthan			4580	100	25	4705
18. Sikkim			50	5		55
19. Tamil Nadu			101			101
20. Tripura			97			97
21. Uttar Pradesh		2680	3650	110		7440
22. West Bengal			3473	3164		6637
23. A & N Islands						
24. Arunachal Pradesh						
25. Chandigarh			100			100
26. Delhi			15	2	33	50
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu			110			110
29. Lakshadweep						
30. Mizoram						
31. Pondicherry			17			17
TOTAL	3160	4228	32734	5806	424	46352

PSC PIPE

REQUIREMENT DURING 1981-91
(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh				270	900	1,170
2. Assam						
3. Bihar						
4. Gujarat	5	2	111	31	61	210
5. Haryana						
6. Himachal Pradesh						
7. Jammu & Kashmir			3	11	4	18
8. Karnataka				130	25	155
9. Kerala			50	80		130
10. Madhya Pradesh	6	7	15			28
11. Maharashtra						
12. Manipur						
13. Meghalaya						
14. Nagaland						
15. Orissa				69		69
16. Punjab						
17. Rajasthan						
18. Sikkim						
19. Tamil Nadu			2	104	16	122
20. Tripura						
21. Uttar Pradesh						
22. West Bengal			50	240	180	470
23. A & N Islands						
24. Arunachal Pradesh						
25. Chandigarh						
26. Delhi				192	115	307
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu				20	20	40
29. Lakshadweep						
30. Mizoram						
31. Pondicherry						
TOTAL	11	9	231	1147	1321	2719

STEEL PIPE

REQUIREMENT DURING 1981-91

(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh					48	48
2. Assam		1 889				1 889
3. Bihar		150	60	250		460
4. Gujarat	1 020	15	10	32		1 077
5. Haryana		29	29			58
6. Himachal Pradesh	100	130				230
7. Jammu & Kashmir		9	90	18	2	119
8. Karnataka					70	70
9. Kerala			10	5	2	17
10. Madhya Pradesh	67	25				92
11. Maharashtra				300	75	375
12. Manipur			15	30		45
13. Meghalaya	38	84	8			130
14. Nagaland			60			60
15. Orissa				5		5
16. Punjab						
17. Rajasthan	2 226	349		3	2	2 580
18. Sikkim						
19. Tamil Nadu		758	27	14	30	829
20. Tripura		19				19
21. Uttar Pradesh		37	1			38
22. West Bengal		60	240	200	290	790
23. A & N Islands						
24. Arunachal Pradesh						
25. Chandigarh					200	200
26. Delhi		1	1	10	6	18
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu				150	23	173
29. Lakshadweep						
30. Mizoram	100	120	20			240
31. Pondicherry		6	6			12
TOTAL	3 551	3 681	577	1 017	748	9 574

STONEWARE PIPE

REQUIREMENT DURING 1981-91
(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh	8700	1545	368			10613
2. Assam	4600	380				4980
3. Bihar	8046	2185	400			10631
4. Gujarat		1210	230			1440
5. Haryana	250	465	270			985
6. Himachal Pradesh	850	1200	350			2400
7. Jammu & Kashmir		145	195			340
8. Karnataka	9200	1225	200			10625
9. Kerala	5000	10000	1500			16500
10. Madhya Pradesh	8500	470	170			9140
11. Maharashtra		14071	2177			16248
12. Manipur	190	100				290
13. Meghalaya	33	44				77
14. Nagaland	10	10				20
15. Orissa		1800	60			1860
16. Punjab	1962	447	103			2512
17. Rajasthan	1855	4119	605			6579
18. Sikkim	40					40
19. Tamil Nadu	42	7319	427			7788
20. Tripura	141	46				187
21. Uttar Pradesh	700		550			1250
22. West Bengal	6765	1425	5			8195
23. A & N Islands	18	15				33
24. Arunachal Pradesh						
25. Chandigarh		70	20			90
26. Delhi						
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu	295	110	50			455
29. Lakshadweep						
30. Mizoram	6	150	62			218
31. Pondicherry	79	50	25			154
TOTAL	57277	48601	7767			113645

GI-PIPE

REQUIREMENT DURING 1981-91

(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh	565					565
2. Assam	5276	991				6267
3. Bihar	3952					3952
4. Gujarat	1590	3				1593
5. Haryana	2175					2175
6. Himachal Pradesh	29150	1250				30400
7. Jammu & Kashmir	6950	90				7040
8. Karnataka	1230					1230
9. Kerala	4600	95				4695
10. Madhya Pradesh	8699	658				9357
11. Maharashtra	725					725
12. Manipur	905					905
13. Meghalaya	8190	3				8193
14. Nagaland	9740	30				9770
15. Orissa	890	1020				1910
16. Punjab	1433					1433
17. Rajasthan	2465					2465
18. Sikkim	5946	60				6006
19. Tamil Nadu	15036	425				15461
20. Tripura	310					310
21. Uttar Pradesh	15000	230				15230
22. West Bengal	14125	970				15095
23. A & N Islands						
24. Arunachal Pradesh	550	1500				2050
25. Chandigarh	2					2
26. Delhi	30					30
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu	950					950
29. Lakshadweep	60					60
30. Mizoram	2690	100				2790
31. Pondicherry	200	44				244
TOTAL	143434	7469				150903

PLASTIC PIPE

REQUIREMENT DURING 1981-91

(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh	4850					4850
2. Assam	9440	510				9950
3. Bihar						
4. Gujarat	78	34				112
5. Haryana	22000	5000				27000
6. Himachal Pradesh	5500					5500
7. Jammu & Kashmir	1856	60	30			1946
8. Karnataka	24450	5960	500			30910
9. Kerala	19000	6700	800			26500
10. Madhya Pradesh	3140	175				3315
11. Maharashtra	2660	500				3160
12. Manipur	2857	285				3142
13. Meghalaya	598	20				618
14. Nagaland						
15. Orissa		8600	450			9050
16. Punjab	10093	93				10186
17. Rajasthan	5121	2923				8044
18. Sikkim						
19. Tamil Nadu	34000	11253				45253
20. Tripura	1073	646				1719
21. Uttar Pradesh	40208	26300				66508
22. West Bengal	1400	2800				4200
23. A & N Islands						
24. Arunachal Pradesh	550	150				700
25. Chandigarh	15	6				21
26. Delhi	12					12
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu	320	160				480
29. Lakshadweep						
30. Mizoram	50					50
31. Pondicherry	57					57
TOTAL	189358	72175	1780			263313

AC PIPE

REQUIREMENT DURING 1981-91

(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh	8189	3303	1575			12,067
2. Assam	7419	3722				11,141
3. Bihar			18	250		268
4. Gujarat	4981	519	335	15		5850
5. Haryana	11400	8400				19800
6. Himachal Pradesh						
7. Jammu & Kashmir	124	80	55			259
8. Karnataka		1400				1400
9. Kerala	7200	8000				15200
10. Madhya Pradesh	26185	2380	185			28750
11. Maharashtra	24356	8340	446			33142
12. Manipur	3568	473				4041
13. Meghalaya	139	60				199
14. Nagaland						
15. Orissa		125	500			625
16. Punjab	10460	3190				13650
17. Rajasthan	14622	3591	243	7		18463
18. Sikkim						
19. Tamil Nadu	4899	10817	1744			17460
20. Tripura						
21. Uttar Pradesh		11300	6100	50		17450
22. West Bengal	14350	5200				19550
23. A & N Islands						
24. Arunachal Pradesh	120					120
25. Chandigarh	136	76	130	6		348
26. Delhi	400	235	3			638
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu	640	340				980
29. Lakshadweep	50	20				70
30. Mizoram		220	40	10		270
31. Pondicherry						
TOTAL	139,238	71,791	10,374	338		221,741

CI PIPE

REQUIREMENT DURING 1981-91

(IN KILOMETERS)

	Upto 100 mm	110-200 mm	250-500 mm	600-1000 mm	1000 mm	TOTAL
1. Andhra Pradesh		442	278	117		837
2. Assam	562	1245	1494			3301
3. Bihar	870	1250	961			3081
4. Gujarat	1161	1093	982	313		3549
5. Haryana	2100	2275	472	25		4872
6. Himachal Pradesh	450	330	170	24		974
7. Jammu & Kashmir	57	608	255	44		964
8. Karnataka	500	5900	4260	160	30	10850
9. Kerala	15	450	620	355	25	1465
10. Madhya Pradesh	1123	571	803	205		2702
11. Maharashtra	2263	2388	3940	1245		9836
12. Manipur	1305	982	200	32		2519
13. Meghalaya	1811	462	125	3		2401
14. Nagaland		40			30	70
15. Orissa		960	555	100	80	1695
16. Punjab	477	367	113			957
17. Rajasthan	6419	1064	119	16		7618
18. Sikkim		20		4		24
19. Tamil Nadu	201	519	2534	292	15	3561
20. Tripura	4400	2064	57	87		6608
21. Uttar Pradesh	210	1530	415	490		2645
22. West Bengal	1380	3400	3216	2603	336	10935
23. A & N Islands			20			20
24. Arunachal Pradesh	5	10				15
25. Chandigarh	136	76	130	6		348
26. Delhi	82	156	194	30	34	496
27. Dadra & Nagar Haveli						
28. Goa, Daman & Diu	130	120	115	40		405
29. Lakshadweep			4			4
30. Mizoram		90	15			105
31. Pondicherry		17	27			44
TOTAL	25657	28429	22074	6191	550	82901

STATEWISE REQUIREMENT OF CEMENT (IN TONNES)

Sl. No.	State/Uts.	Total require- ment during Decade (1981-91)	Requirement during 1981-85
1	Andhra Pradesh	796800	181538
2	Assam	315300	34690
3	Bihar	941000	139026
4	Gujarat	619150	198125
5	Haryana	320900	105897
6	Himachal Pradesh	87250	38368
7	Jammu & Kashmir	135000	105445
8	Karnataka	720000	220000
9	Kerala	305000	51850
10	Madhya Pradesh	1611350	72835
11	Maharashtra	1599000	719550
12	Manipur	54750	17520
13	Meghalaya	54920	30206
14	Nagaland	26168	10729
15	Orissa	387160	34720
16	Punjab	447500	147700
17	Rajasthan	520670	161386
18	Sikkim	34300	19551
19	Tamil Nadu	122712	412583
20	Tripura	36600	10730
21	Uttar Pradesh	1175500	263250
22	West Bengal	1638656	74100
23	A & N Islands	4800	3800
24	Arunachal Pradesh	7835	6240
25	Chaudigarh	82000	11480
26	Delhi	27325	145733
27	Dadra & Nagar Haveli	680	130
28	Goa, Daman & Diu	58800	7820
29	Lakshadweep	2950	91
30	Mizoram	35260	12950
31	Pondicherry	11650	4650

GRAND TOTAL :

13 377 046

3 245 696

13.4 million tonnes

3.25 million tonnes

REQUIREMENT DURING THE DECADE

Sl. No.	State/UT.	Power Pumps					Total
		0-5 BHP;	6-10 BHP	11-20 BHP	21-50 BHP	Above 50 BHP	
						Borehole (in nos.)	
1.	Andhra Pradesh	4240	5003	2105	630	55	12441
2.	Assam	710	2010	1064	82	12	3878
3.	Bihar	82	682	1052	252	108	2254
4.	Gujarat	320	459	240	140	174	1403
5.	Haryana	160	630	640	200	Nil	1630
6.	Himachal Pradesh	..	10	20	10	10	50
7.	J & K	208	1300	380	150	10	2010
8.	Karnataka	15814	5450	61	..	..	21390
9.	Kerala	30	150	250	100	40	570
10.	Madhya Pradesh	7260	325	325	215	45	8170
11.	Maharashtra	5600	6000	..	..	..	11600
12.	Manipur	..	..	4	..	..	4
13.	Meghalaya	200	150	75	75	..	500
14.	Nagaland	..	50	..	25	..	75
15.	Orissa	3720	1734	264	70	..	4808
16.	Punjab	978	918	927	513	137	3473
17.	Rajasthan	6343	2600	2883	18	..	11844
18.	Sikkim	..	..	..	..	..	..
19.	Tamilnadu	1128	7575	976	1130	200	11009
20.	Tripura	..	..	270	75	..	345
21.	Uttar Pradesh	..	350	1520	1140	340	3370
22.	West Bengal	40	231	1302	1218	688	3479
23.	A & N Islands	..	..	..	..	..	..
24.	Arunachal Pradesh	..	..	..	..	..	..
25.	Chandigarh	..	..	5	5	10	20
26.	Delhi	100	120	95	50	60	425
27.	Dadra & Nagar Haveli	NA	NA	NA	NA	NA	..
28.	Goa, Daman & Diu	120	18	9	43	56	246
29.	Lakshadweep	..	..	..	..	..	..
30.	Mizoram	..	..	..	..	..	..
31.	Pondicherry	15	12	4	..	..	21
Grand Total :		47195	35577	14408	6169	2015	105415

REQUIREMENT DURING THE DECADE

Sl. No.	State/UT	Power Pumps					Total
		Vertical					
		0-5 BHP	6-10 BHP	11-20 BHP	21-50 BHP	Above 50 BHP	
1.	Andhra Pradesh	163	164	12	6	55	400
2.	Assam	16	39	68	49	34	206
3.	Bihar	45	85	146	117	60	453
4.	Gujarat	410	355	95	206	181	1247
5.	Haryana	..	..	..	..	..	..
6.	Himachal Pradesh	..	54	66	100	65	285
7.	J & K	..	30	50	230	190	500
8.	Karnataka	209	117	116	138	71	651
9.	Kerala	50	120	1250	400	215	2035
10.	Madhya Pradesh	5	115	285	210	121	736
11.	Maharashtra	6050	6000	3025	715	450	16300
12.	Manipur	..	..	40	40	15	95
13.	Meghalaya	4	40	43	64	19	170
14.	Nagaland	..	..	200	..	20	220
15.	Orissa	..	714	91	201	62	1068
16.	Punjab	..	..	..	..	..	..
17.	Rajasthan	..	..	..	..	..	..
18.	Sikkim	..	..	..	..	..	..
19.	Tamil Nadu	8	30	245	603	1060	1946
20.	Tripura	..	50	..	10	30	90
21.	Uttar Pradesh	..	..	..	40	30	70
22.	West Bengal	..	..	..	..	10	10
23.	A&N Islands	..	..	..	..	5	5
24.	Arunachal Pradesh	..	..	..	..	..	..
25.	Chandigarh	..	..	..	..	..	..
26.	Delhi	30	50	50	20	80	230
27.	Dadra & Nagar Haveli	NA	NA	NA	NA	NA	NA
28.	Goa, Daman & Diu	..	..	..	25	50	75
29.	Lakshadweep	8	4	..	..	..	12
30.	Mizoram	..	..	..	193	165	358
31.	Pondicherry	5	24	18	15	10	72
Grand Total :		7003	7991	5800	3442	2990	27234

REQUIREMENT DURING THE DECADE

Sl.No.	State/UT	Power Pumps					Total
		Horizontal					
		0-5 BHP	6-10 BHP	11-20 BHP	21-50 BHP	Above 50 BHP	
						(In Nos.)	
1.	Andhra Pradesh	85	85	76	71	317	694
2.	Assam	2759	334	2234	152	79	5558
3.	Bihar	80	180	400	150	120	930
4.	Gujarat	1010	1259	765	395	291	3724
5.	Haryana	100	160	250	240	40	790
6.	Himachal Pradesh	100	320	525	630	110	1685
7.	J. & K	315	445	460	360	150	1730
8.	Karnataka	1275	100	106	325	214	2020
9.	Kerala	..	150	1200	500	430	2260
10.	Madhya Pradesh	5445	165	230	210	115	6165
11.	Maharashtra	900	75	150	75	150	1350
12.	Manipur	..	60	110	125	55	1350
13.	Meghalaya	35	57	168	52	41	353
14.	Nagaland	..	20	..	10	50	80
15.	Orissa	..	1666	243	106	60	2075
16.	Punjab	113	149	268	71	..	541
17.	Rajasthan	14073	6308	8142	320	76	28919
18.	Sikkim	..	40	10	..	..	50
19.	Tamilnadu	1289	326	437	694	1287	4033
20.	Tripura	..	30	250	95	40	415
21.	U.P.	..	..	..	15	15	30
22.	West Bengal	20	253	183	658	113	1227
23.	A&N Islands	30	20	70	30	10	160
24.	Arunachal Pradesh	100	100	100	..	..	300
25.	Chandigarh	..	..	..	..	12	12
26.	Delhi	..	20	32	50	85	187
27.	Dadra & Nagar Haveli	NA	NA	NA	NA	NA	NA
28.	Goa, Daman & Diu	8	..	..	25	50	83
29.	Lakshadweep	10	10	..	..	..	20
30.	Mizoram	..	..	..	..	..	..
31.	Pondicherry	5	10	14	14	4	47
Grand Total :		27752	12322	16363	5373	3980	65790

REQUIREMENT OF D.W. HANDPUMPS (IN NOS.)

Sl.No.	State/UT	Total requirement during decade 1981-91	Tentative requirement during 1981-85
1.	Andhra Pradesh	33520	6704
2.	Assam	1300	143
3.	Bihar	30500	2935
4.	Gujarat	10275	3288
5.	Haryana	..	..
6.	Himachal Pradesh	100	44
7.	Jammu & Kashmir	500	..
8.	Karnataka	60000	10200
9.	Kerala	4500	765
10.	Madhya Pradesh	80000	11200
11.	Maharashtra	20300	9135
12.	Manipur	300	96
13.	Meghalaya	850	..
14.	Nagaland	..	..
15.	Orissa	53000	8820
16.	Punjab	..	..
17.	Rajasthan	47190	14629
18.	Sikkim	25	14
19.	Tamil Nadu	25500	7395
20.	Tripura	6000	1740
21.	Uttar Pradesh	24500	600
22.	West Bengal	101750	10175
23.	A & N Islands	..	..
24.	Arunachal Pradesh	200	160
25.	Chandigarh	..	..
26.	Delhi	150	81
27.	Dadra & Nagar Haveli	300	100
28.	Goa, Daman & Diu	80	27
29.	Lakshadweep	..	..
30.	Mizoram	..	..
31.	Pondicherry	12	5
Grand Total		742852	88254

REQUIREMENT OF TRANSPORTATION EQUIPMENT

Sl. No.	Item	Requirement During				Requirement During		Grand Total requirement (1981-91)
		81-82 (Col. 7 × 0.19)	82-83 (Col. 3 × 1.1125)	83-84 (Col. 4 × 1.1125)	84-85 (Col. 7— col. 3+ Col. 4+ Col. 5) (6)	81-85 Col. 9 × 0.30)	1985-91 (Col. 9 × 0.70)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Trucks (in Nos.)								
	(i) Tripper 180 BHP	165	184	205	316	370	2029	2899
	(ii) Tripper 110 BHP	127	141	157	243	668	1557	2225
	(iii) Others	17	20	22	28	87	204	291
	(iv) Total	309	344	383	589	1625	3790	5415
2. Trailers (in Nos.)								
	(i) 2.5 cfm	124	138	154	234	650	2516	2166
	(ii) 3.38 cfm	40	45	50	75	210	489	699
	(iii) Others	11	12	13	22	58	136	194
	(iv) Total	175	195	217	331	918	1341	3059
3. Tractors (in Nos.)								
	(i) For 2(i) above	28	31	34	56	149	349	498
	(ii) For 2 (ii) above	28	31	34	54	147	343	490
	(iii) For 2(iii) above	..	..	..	..	..	..	..
	(iv) Total	56	62	58	110	296	692	988
4.	Motor Cycles (in Nos.)	1171	1303	1430	2238	6162	14378	20540
5.	Cycles (in Nos.)	1181	1314	1462	2259	6216	14503	20719
6. Mobile Vehicles (in Nos.)								
	(i) Jeep (18.22 H.P.)	531	591	657	1017	2796	6524	9320
	(ii) Pick Ups (19.6 HP)	120	134	149	226	629	1468	2097
	(iii) Cars (13.22 HP)	86	96	107	161	450	1052	1502
	(iv) Mini Buses (39.6 HP)	35	39	43	66	183	426	609
	(v) Total	772	860	956	1470	4058	9470	13528
7.	Accessories*	15%	15%	15%	15%	15%	15%	15%
8.	Spares*	1%	1%	1%	1%	1%	1%	1%

*By percentage of total cost of transportation equipment.

STATEWISE REQUIREMENT OF ELECTRICAL POWER DURING 1981-85
(MEGAWATTS)
(IN MW)

No.	State/UT	Requirement during 1981-85	Requirement during 1985-91	Total requirement during Decade (1981-91)
1.	Andhra Pradesh	100.00	121.00	221
2.	Assam	6.00	47.00	53
3.	Bihar	10.00	45.00	55
4.	Gujarat	23.00	49.00	72
5.	Haryana	10.00	19.00	29
6.	Himachal Pradesh	28.00	35.00	63
7.	Jammu and Kashmir	32.00	46.00	78
8.	Karnataka	52.00	100.00	152
9.	Kerala	22.00	108.00	130
10.	Madhya Pradesh	16.00	100.00	116
11.	Maharashtra	135.00	300.00	435
12.	Manipur	4.00	8.00	12
13.	Meghalaya	5.00	6.00	11
14.	Nagaland	4.00	6.00	10
15.	Orissa	5.00	27.00	32
16.	Punjab	17.00	49.00	66
17.	Rajasthan	82.00	183.00	265
18.	Sikkim	1.00	2.00	3
19.	Tamil Nadu	68.00	165.00	233
20.	Tripura	6.00	13.00	19
21.	Uttar Pradesh	25.00	135.00	160
22.	West Bengal	25.00	225.00	250
23.	A & N Island	Nil	Nil	Nil
24.	Arunachal Pradesh	2.00	3.00	5
25.	Chandigarh	1.00	4.00	5
26.	Delhi	50.00	65.00	115
27.	Dadra & Nagar Haveli	Nil	Nil	Nil
28.	Goa, Daman & Diu	3.00	7.00	10
29.	Lakshadweep	1.00	Nil	1
30.	Mizoram	3.00	6.00	9
31.	Pondicherry	1.00	3.00	4
GRAND TOTAL		737.00	1877.00	2614
Percentage		28.0	72.0	100

STATEWISE REQUIREMENT OF PETROL

		(In M.T)		
Sl. No.	State/UT	Requirement during 1981-85	Requirement during 1985-91	Total requirement during Decade (1981-91)
1	Andhra Pradesh	2190	10000	12190
2	Assam	125	1007	1132
3	Bihar	3403	16547	20000
4	Gujarat	9248	19652	28900
5	Haryana	1002	2008	3010
6	Himachal Pradesh	814	1036	1850
7	Jammu and Kashmir	2050	2950	5000
8	Karnataka	650	3000	3650
9	Kerala	3250	8000	11250
10	Madhya Pradesh	9740	40000	49740
11	Maharashtra	20000	40600	60600
12	Manipur	192	403	600
13	Meghalaya	300	390	690
14	Nagaland	100	170	270
15	Orissa	1370	8420	9790
16	Punjab	3400	10000	13400
17	Rajasthan	6000	14000	20000
18	Sikkim	1000	1190	2190
19	Tamil Nadu	4030	9880	13910
20	Tripura	113	277	390
21	Uttar Pradesh	27750	15750	43500
22	West Bengal	1338	12042	13380
23	A & N Islands	275	400	675
24	Arunachal Pradesh	80	120	200
25	Chandigarh	120	730	850
26	Delhi	400	500	900
27	Dadra & Nagar Haveli	2	3	5
28	Goa, Daman & Diu	2020	4000	6020
29	Lakshadweep	14	86	100
30	Mizoram	328	1312	1640
31	Pondicherry	310	600	910
GRAND TOTAL		101614	366628	468242
Percentage		21.7	78.3	100

STATEWISE REQUIREMENT OF DIESEL

(In M.T)			
Sl. No.	State/UT	Requirement during 1981-85	Requirement during 1985-91 Total requirement during (1981-91)
1	Andhra Pradesh	24100	96000
2	Assam	1660	13430
3	Bihar	5100	24900
4	Gujarat	17604	37410
5	Haryana	6240	12670
6	Himachal Pradesh	1848	2352
7	Jammu and Kashmir	2973	4277
8	Karnataka	7400	20000
9	Kerala	11500	20000
10	Madhya Pradesh	9660	59340
11	Maharashtra	16000	30000
12	Manipur	1642	3488
13	Meghalaya	1593	1947
14	Nagaland	590	850
15	Orissa	6400	39300
16	Punjab	9000	16050
17	Rajasthan	18237	40593
18	Sikkim	986	1204
19	Tamil Nadu	15950	39050
20	Tripura	610	1700
21	Uttar Pradesh	16650	94350
22	West Bengal	4920	44280
23	A & N Islands	2800	6000
24	Arunachal Pradesh	1850	3150
25	Chandigarh	56	344
26	Delhi	2039	2491
27	Dadra & Nagar Haveli	50	100
28	Goa, Damian & Diu	1000	2900
29	Lakshadweep	10	140
30	Mizoram	1600	4400
31	Pondicherry	550	1200
GRAND TOTAL		190618	625916
Percentage		23.3	76.7

STATEWISE REQUIREMENT OF LUBRICATION OIL (IN MT)

Sl. No.	State/UT	Requirement during 1981- 85	Requirement during 1985- 91	Total Requirement during Decade (1981- 91)
1	Andhra Pradesh	2000	4550	6550
2	Assam	90	721	811
3	Bihar	435	2065	2500
4	Gujarat	1375	2920	4295
5	Haryana	392	793	1185
6	Himachal Pradesh	139	176	315
7	Jammu & Kashmir	250	380	630
8	Karnataka	500	1200	1700
9	Kerala	800	1500	2300
10	Madhya Pradesh	657	4033	4690
11	Maharashtra	2300	3000	5300
12	Manipur	184	389	573
13	Meghalaya	100	111	211
14	Nagaland	46	45	91
15	Orissa	770	4730	5500
16	Punjab	402	1032	1434
17	Rajasthan	364	809	1173
18	Sikkim	58	87	145
19	Tamil Nadu	410	1049	1459
20	Tripura	39	100	139
21	Uttar Pradesh	2325	13175	15500
22	West Bengal	315	2815	3130
23	A. and N. Islands	190	300	490
24	Arunachal Pradesh	85	165	250
25	Chandigarh	10	50	60
26	Delhi	110	166	276
27	Dadra & Nagar Haveli	3	5	8
28	Goa, Daman & Diu	170	300	470
29	Lakshadweep	5	10	15
30	Mizoram	146	584	730
31	Pondicherry	46	90	136
GRAND TOTAL		14704	47350	62054
Percentage		23.7	76.3	100

STATEWISE REQUIREMENT FOR WELL DRILLING RIGS

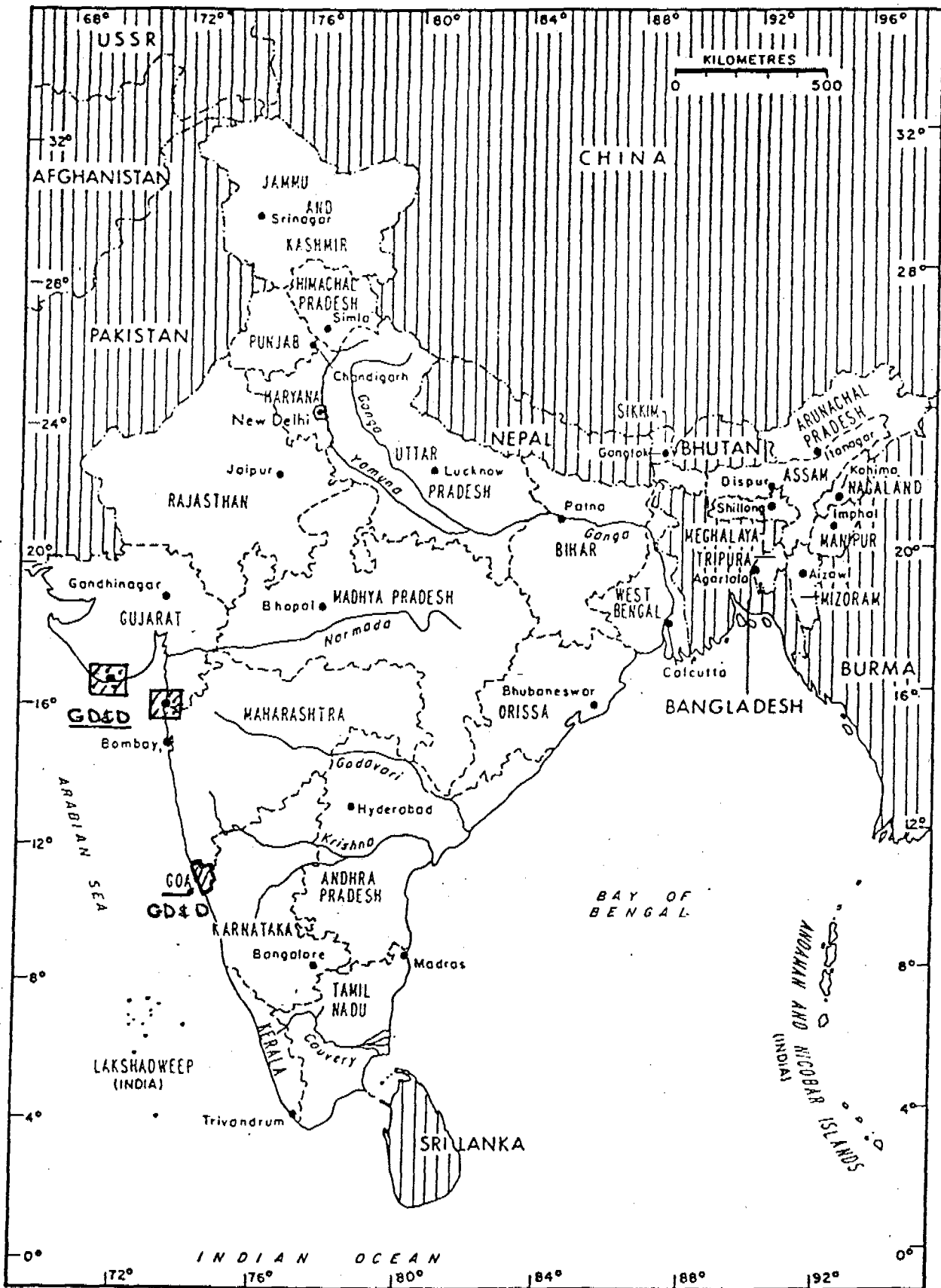
State/UT	PHASE I 1983 - 1985								PHASE II 1985 - 1991								Grand Total
	DTH		DR	RR	CT	CB	Total		DTH		DR	RR	CT	CB	Total		
	4"	6"					DTH	NDTH	4"	6"					DTH	NDTH	
Andhra Pradesh			20			10		30			20			10		30	60
Assam		1	8		5		1	13			36		14			50	64
Bihar	5						5		20						20		25
Gujarat	22	5	8			1	27	9									36
Haryana				1	1			2									2
Himachal Pradesh		6	4				6	4									10
Jammu & Kashmir	4	8	6	4	9	4	12	23									25
Karnataka		16	2			4	16	6	8					8			30
Madhya Pradesh	60	53	20		20	60	113	100	5					5			218
Maharashtra		13	2			6	13	8	19	3				19	3		43
Manipur						1		1									1
Meghalaya			2			3		5									5
Orissa		6			2	9	6	11	4					4			21
Punjab				3	3			6			16	3			19		25
Rajasthan			10					10		20					20		30
Tamilnadu			10					10		4					4		14
Tripura			8					8									8
West Bengal			6	5	9			20									20
Goa, Daman & Diu		1						1									1
Total	91	109	106	13	49	98	200	266	20	36	83	16	17	10	56	126	648

NOTE: The following States/UTs had no drilling requirements: Kerala, Nagaland, Sikkim, Uttar Pradesh, A & N Island, Arunachal Pradesh, Chandigarh, Delhi, Dadra, Lakshadweep, Mizoram & Pondicherry.

LEGEND : DTH : Down the hole hammer
 NDTH : Non - DTH
 DR : Direct Rotary
 RR : Reverse Rotary
 CT : Cable Tool
 CB : Combination

SUMMARY			
Type	Phase I	Phase II	Total
DTH	200	56	256
NDTH	266	126	392
Total	466	182	648

UNION TERRITORY OF GOA, DAMAN & DIU



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION DECADE (APRIL 1981 - MARCH 1991)
FOR
GOA, DAMAN & DIU

1. INTRODUCTION

The Union Territory of Goa, Daman and Diu comprises of three independent land blocks situated on the West Coast of India, each block being now a separate district viz. (i) Goa, (ii) Daman, and (iii) Diu, separated from one another by distances of over 500 Kms.

Prior to its liberation in 1961, only a few towns - Panaji, Ponda, Margao and Vasco and a few villages enroute had the privilege of protected water supply. No town in this Territory was provided with sewerage system before liberation.

After liberation of Goa, the capacities of the existing water supply systems were increased. Besides meeting the increasing demand of the towns already covered under this system, the industrial demands were also covered. In addition to the above, many villages have been provided with independent piped water supply schemes and drinking water wells under Rural Water Supply Schemes.

On the sanitation front, the capital town of Panaji was provided with the sewerage system and was also provided with a Sewage Treatment Plant, covering a population of 58,000.

The Union Territory of Goa, extending over 3611 Km² of area, lies on the West Coast of India. Its capital, Panaji, is situated on the bank of the river Mandovi, 320 Km south of Bombay.

Bound by the Arabian Sea on the West, the Goa district touches Maharashtra in the North and Karnataka in the East and South. Its length from the extreme North to extreme South measures 105 Kms. and from East to West 60 Kms.

Daman is surrounded on all the three land sides by Gujarat State while Diu is an island in the Gulf of Kambay, off the coast of the Saurashtra (Gujarat State) near Veraval Port Town.

The areas of the Daman and Diu Districts are 72 Sq. Kms. and 40 Sq. Kms. respectively.

The average rainfall of 3530 mm is more representative of coastal places than that of interior places like Colem and Dudsagar, where it attains nearly double of the average.

2. SOCIO-ECONOMIC INDICATORS

As per 1971 Census, the Territory had a total population of 8.56 lakhs. The population has increased to 10,82,117 as recorded in the 1981 Census. (As per 1981 projection the population is 1161 thousands and as per 1991 projection, it will be 1519 thousands.) The rate of growth witnessed in the decade 1971-81 is 26.15%.

In 1981 population projection, the number of urban dwellers is 4.30 lakhs, accounting for 37% of the total population. The territory has 17 towns.

As per the notification of Government of Goa, Daman and Diu, there were in all 462 revenue villages in the Territory. Of them, 29 were included in 17 towns. The remaining 433 revenue villages are considered to be separate rural units for the purpose of census. As per 1981 projection, the rural population is 7.31 lakhs, which constitutes 63% of the total population.

Per capita income for the year 1970-71 was Rs. 915.70 and has increased to Rs. 2011.61 in 1978-79.

The literacy for the population of the Territory is 55.86% based on 1981 Census; that for the males is slightly higher (64.77%) than for the females which is 46.78% as against all India figures of 37.26% for the total population, 44.95% for the males and 23.95% for the females.

3. HEALTH ASPECTS

The crude birth rate per 1000 is 21 and death rate is 9.2 and the infant mortality is 54 as in 1981. The territory has a variety of health facilities, consisting of hospitals (both public and private), health centres (both urban and rural), Clinics (for special diseases like T.B. and Leprosy) and Family Welfare Institutions.

4. WATER RESOURCES

Part of rain water flows percolate down into the ground, to join the ground water. The rainfall run off co-efficient is 0.70 and thus 70% of rain water flows on surface. The total surface water resources of the Territory can be taken as 8670 million cubic meters.

A major part of the territory is underlain by hard rocks of Precambrian age over which lies a relatively thin mantle of weathered rock, laterite and lateritic soil of quaternary period. The aquifers of this area are recharged seasonally by precipitation during the period June to August. However, the generalised water table is at a higher level than the stream surface. Consequently, most streams gain water from, rather than lose water, to the aquifers.

5. PRESENT STATUS OF WATER SUPPLY & SANITATION

It has been assessed that as on 31.3.1981, 3.32 lakhs of urban population constituting 77.2% as per 1981 projection and 1.68 lakhs of rural population constituting 22.98% have been provided with water supply facilities. Similarly, in case of sanitation, 58 thousand of urban population constituting 13.5% have been provided with sanitation facilities whereas in rural areas it is nil.

6. SECTOR ORGANIZATION

The administration is headed by the Lt. Governor, appointed by the President of India. He is advised by the Cabinet on policy matters.

The Public Works Department is the sole authority for planning, design, execution and maintenance of all Rural and Urban Water Supply, rural and urban sanitation projects and facilities. The Municipalities and the Village Panchayats have been empowered to take up water supply and sanitation in their respective areas. However, due to the organizational and financial inadequacy of these institutions, no such works are being taken up by them.

7. DECADE PLAN TARGETS (POPULATION COVERAGE)

Coverage Proposals for Urban Population During the Decade Programme

(Population in Thousands)

Year	Population to be covered.
6th Plan	
1981-85	47
1985-86	80
1986-87	70
1987-88	70
1988-89	50
1989-90	41
1990-91	40
Total	398

Out of the total 433 villages in the Territory 228 villages (114 problem + 114 non-problem) were covered under protected water supply as on 31.3.81. The remaining 205 villages are proposed to be covered during the Decade period.

Coverage proposals for the Rural Water Supply during the Decade Programme

(Population in Thousands)	
Year	Population to be covered
6th Plan	
1981-85	227.00
1985-86	42.00
1986-87	52.50
1987-88	48.50
1988-89	69.40
1989-90	90.90
1990-91	90.70
Total:	621.00

General Abstract of the Target Water Supply

Description	Coverage					
	Water Supply			Sanitation		
	Urban	Rural	Total	Urban	Rural	Total
Population served as on 31.3.81	332	168	500	58	-	58
Population to be served in 1981-91	398	621	1019	526	197	723
Total population to be served as on 31.3.1991	730	789	1519	584	197	781
Total population projected for 1991	730	789	1519	730	789	1519
Percentage coverage as on 31.3.1991	100	100	100	80	25	51.4

8. DECADE PROGRAMME FUNDING

The total investment costs for the schemes to be taken up under Decade Programme is as follows:

a. Urban Water Supply	- Rs. 25,8700 Crores
b. Rural Water Supply	- Rs. 17,4140 Crores
c. Urban Sanitation	- Rs. 14,6960 Crores
d. Rural Sanitation	- Rs. 0,9850 Crores
Total Investment Cost for the Decade.	- Rs. 58,9650 Crores

Allocation of funds in Plan & Resource Requirements

(Rupees in Crores)

Total 6th Plan Outlay for the Territory	Outlay for the Water Supply Sanitation Sector in the 6th Plan.	Fund available during 81-85 for Decade programme.	Total Requirement of the Decade Programme.	Additional Requirement of the resource to complete the target of the Decade
192.00	23.025	19.9987	58.965	38.9663

NOTE: Decade Programme starts by 1981-82 and the last 4 years of the 6th plan fall under the Decade Programme.

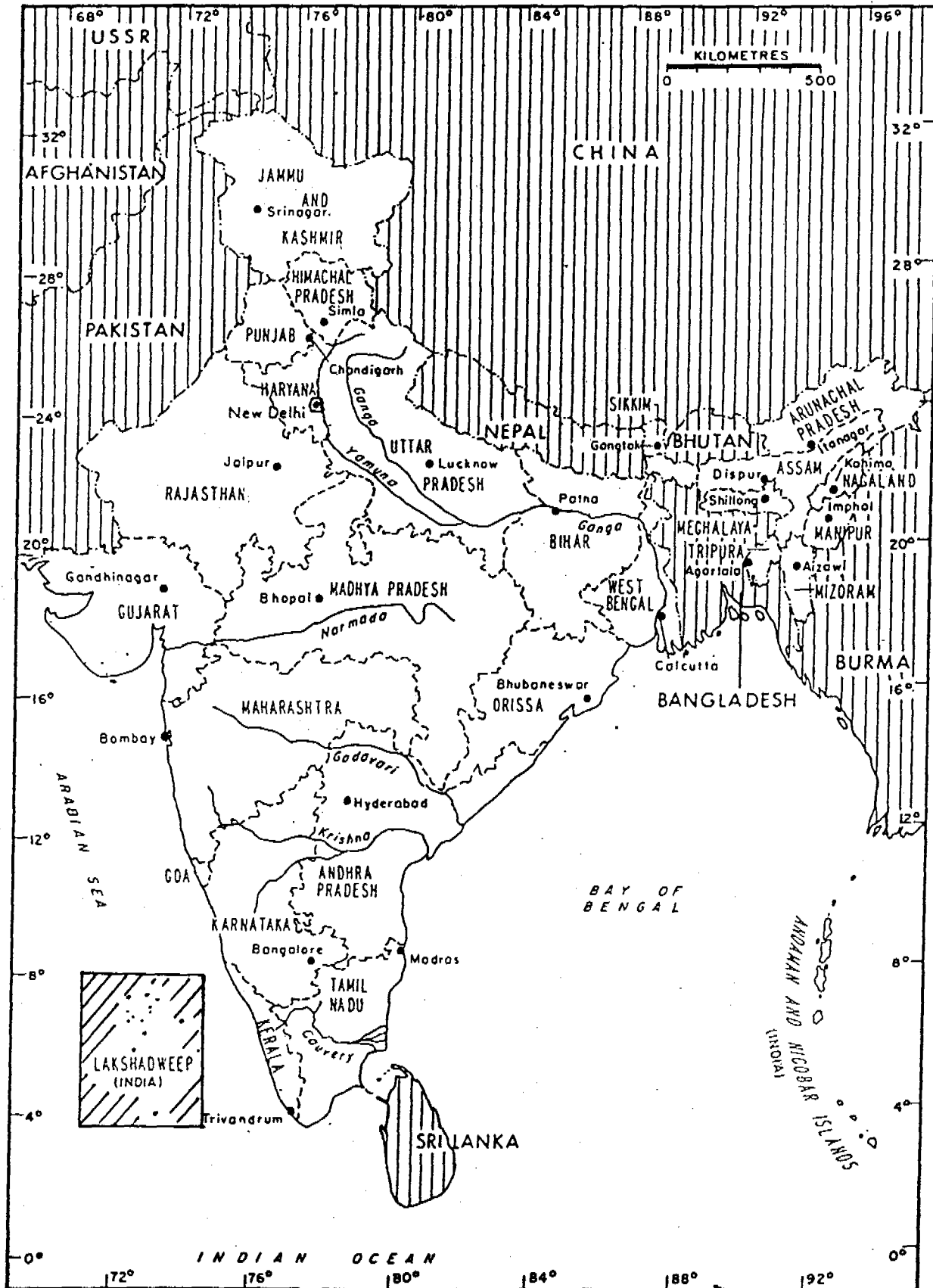
6th Plan outlay	:	23.0025	Crores including ARP allocation
Actual Exp. 1980-81	:	3.0263	
		<u>19.9987</u>	Crores

Proposals for Phasing of Plan Provision under
each Sector Division

(Popln. and cost (Rs.) in thousands)

Year	WATER SUPPLY				SANITATION			
	URBAN		RURAL		URBAN		RURAL	
	Popln. to be covered	Cost	Popln. to be covered	Cost	Popln. to be covered	Cost	Popln. to be covered	Cost
1981-82	10	18760	48	10054	33	5128	-	-
1982-83	12	45798	62	13003	20	4183	-	-
1983-84	12	75463	61	18783	20	6302	38	552
1984-85	13	1206	4	320	17	335	22	100
1985-86	80	21897	74	22231	-	15000	20	1274
1986-87	70	28134	53	13441	110	28500	20	1274
1987-88	70	22805	69	21382	110	28500	20	1274
1988-89	50	14431	70	24590	-	27000	25	1274
1989-90	41	21934	90	25207	110	27000	26	2274
1990-91	46	8272	90	25129	106	5012	26	1828
Total:	398	258700	621	174140	526	146960	197	9850

UNION TERRITORY OF LAKSHADWEEP



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
LAKSHADWEEP

1. INTRODUCTION

There is no separate Sector/Services to take up the Water Supply and Sanitation Works in this Union Territory of Lakshadweep. The Lakshadweep Public Works Department is however entrusted with this job. Since there is no Public Health wing in the Lakshadweep Public Works Department, the advice of Central Public Health Environmental Engineering Organization (CPHEEO), Central Ground Water Board, Geological Survey of India and Kerala Public Health Engineering Department was sought for. The investigation and design of the water supply and sanitation scheme is ultimately entrusted with the Kerala Public Health Engineering Department. The construction part will be taken up by the Lakshadweep Public Works Department.

This territory consists of 36 coral islands out of which 10 are inhabited. The biggest of this group viz., Andrott has an area of 4.8 sq. kms. and the smallest inhabited island Bitra has 0.1 sq.kms. These islands are scattered between 8° and 12°-30' north latitude and between 71° and 74° east longitude. They are lying in the Arabian Sea about 192 to 320 kms. off the west coast of Kerala State.

2. SOCIO-ECONOMIC INDICATORS

Total population as per

1971 Census	32 000
-do- 1981 Projection	36 000 (*)
Projection for 1990	40 000 (*)

(*) As per Decade tables.

The growth rate according to 1981 Census is 26.49% per decade. There is not much migration. The local population in this territory are all scheduled tribes. All the population is living in rural areas. The figures for GNP under preparation.

The main occupation is Agriculture and Fishing.

The percentage of literacy in this territory is very high and more or less uniform in the inhabited islands. The literacy percentage according to 1981 Census is 54.72 per cent.

The main rainy season in this territory extends from May to September. The remaining part of the year is mostly summer. The annual rain fall of the territory is 1600 mm, with less rain fall in the northern islands and more in the southern.

The islands are almost plain and are about 2 to 3 metres above the mean sea level.

High Schools are there in 8 inhabited islands. There is Junior College for Pre-Degree classes in the Capital island Kavaratti. There is no technical institutes available in this territory.

3. HEALTH ASPECTS

Life expectancy - 56 years.

Morbidity and Mortality

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
i. Dysentery	2629-Nil	3316-2	5456-11	3733-1	3746-14
ii. Gastroenteritis	493-Nil	291-4	372-Nil	111-Nil	1167-Nil
iii. Typhoid	21-Nil	13-Nil	14-Nil	26-1	45-Nil
iv. Cholera	Nil-Nil	Nil-Nil	Nil-Nil	Nil-Nil	Nil-Nil
v. Hookworm	1278	1337	1193	1518	1627
vi. Gunea worm	Nil	Nil	Nil	Nil	Nil
vii. Infective Hepatitis	113	229	157	180	349
viii. Dental carries Diet and Nutrition	1108	915	1606	1131	2774

About 76.3 per cent - Mal-Nourished.

Cholera	Nil-Nil	Nil-Nil	Nil-Nil	Nil-Nil	Nil-Nil
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There is no industrial or agricultural pollution or radiation in this territory.

4. WATER RESOURCES

The only source of Drinking Water available in this territory is the rain water which percolates down through the porous sandy soil and floating over the sub soil saline water. However the entire water available in the floating sweet water lens cannot be extracted on account of technical problems on continuous pumping. It is estimated that sufficient quantity of drinking water is available in the s-b soil taking into account the transportation, limitation of extraction of the ground water etc.

5. PRESENT STATUS OF WATER SUPPLY & SANITATION

It is proposed to cover the entire population spread in the area 32 sq.kms. during the decade.

At present there is no organised water supply and sanitation schemes in this territory. The general public is utilising wells as the source of drinking water. There is no special disposal method for the used water. Most of the Government residential accommodation has septic tanks with soak pits. Certain private houses of the locals have also septic tank facilities. Due to the increasing number of construction of residential accommodation, it has become difficult to keep the safe distance between drinking water well and the septic tank soak pits. In addition to this problem existence of the burial grounds, bathing tanks etc., nearer to the drinking water wells also creates pollution problem to the drinking water.

As on 31.3.81, only about 3000 people in the rural areas have been provided with protected water supply which constitute 8.50% of the total population. As regards sanitation the facility provided is practically nil.

The quality of water available in the wells are polluted. People have to boil the water and use for their drinking purposes.

A preliminary report has been received from the Kerala Public Health Engineering Department on the feasibility of having organised water supply in this territory. Detailed investigation is being carried out by the K.P.H.E.D.

The studies regarding desalination of water had been already carried out with the assistance of the Central Salt and Marine Research Institute, Bhavnagar.

6. SECTOR ORGANIZATION

So far there is no separate department/agencies exclusively concerned with Water Supply and Sanitation Sector. The Public Works Department of the Lakshadweep Administration is entrusted with this sector.

There is no distinction between rural or urban water supply and sanitation in this territory as far as the organisational set up is concerned. The Public Works Department is looking after these functions. Since there is no Public Health Engineering Wing in this PWD, the investigation, planning and design part is entrusted with the Kerala Public Health Engineering Department. However, the construction will be taken up by the Lakshadweep PWD.

7. DECADE PLAN & TARGETS

Rural Water Supply - Cent Percent Coverage i.e. a population of 40,000
Rural Sanitation - 25% coverage i.e. a population of 10,000

8. DECADE PROGRAMME FUNDING

The proposal for coverage of rural water supply during the decade period has been assess as 40000 rural people will be provided with potable water supply facilities. This will envisage a fund requirement of Rs.22505 thousands based on 1980 prices. Similarly in regard to rural sanitation it has been proposed to provide 10 thousand people of rural areas with water seal latrines which will require an amount of Rs.5 million.

Hence the total requirement of fund for the decade programme for the V.T. would be of the order of Rs.(22505+5000) = 27505 thousands.

However the fund provided during the 6th plan period is about Rs. 22 lakhs which includes fund requirement of the year 80-81 also. The balance to be met from Seventh Plan.

UNION TERRITORY OF MIZORAM



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
MIZORAM

1. INTRODUCTION

The Union Territory of Mizoram is located in the North Eastern part of India. In the North it is encircled by the States of Assam and Manipur, the western part has Tripura and Bangladesh, the South is bounded by Bangladesh and it has Burma on the Southern border.

Mizoram was one of the districts of Assam till 1972. Union Territory was granted to Mizoram from January 1972. There are three districts namely; Aizwal district with its headquarters at Aizwal, Lunglei district with headquarter at Lunglei and Chittuipui district with the headquarters at Saiha. Aizwal is the capital of Mizoram and is situated at a distance of 180 kms. from Silchar, the district headquarters of Cauchar district of Assam. The nearest railhead and Airport is Silchar.

Mizoram being hilly terrain is mostly covered with forest. The water sources are mainly from springs, streams and rivers. Underground water is practically non-existent. Almost all the towns and villages are given gravity water supply, but most of the towns and villages sources are mostly below them.

The Union Territory of Mizoram has an area of 21,082 sq.km. The territory is mostly hilly and traversed by hill ranges and rivers running in the North-south direction. The average altitude of Mizoram hills is about 1000 metres above mean sea level. It has a very good moderate climate throughout the whole year. The average annual rainfall of Mizoram is 200 - 250 cms.

2. SOCIO-ECONOMIC INDICATIONS

The population of Mizoram as per 1971 census was 332,390. The projected population on 31 March 1981 and 31 March 1991 as per the figures published by the Registrar General of India are taken as 422,000 and 536,000 respectively.

The general economic condition in Mizoram is very poor. The per capita income of Mizoram is below the poverty line. The income is mainly derived from Agriculture, trade and commercial, contractor-ship, small scale industries and government service. There is no industry worth mentioning in Mizoram. Literacy is 59.5%.

3. HEALTH ASPECTS

- (a) Life Expectancy: The average life expectancy in Mizoram, at birth is 60 years. The All India average for year 1981 is 52.6 years for Males & 51.6 years for females.
- (b) Morbidity & Morality: Following table shows the cases on account of malaria, diarrhoea, dysentery and other intestinal diseases.

Cases of gastro enteritis & Malaria in Mizoram
Source : Govt. Statistical Hand Book, Mizoram

Year	Malaria	Diarrhoea/ Dysentery	Stomach & Intestinal Diseases
1973	750	2 023	914
1974	1 152	3 253	4 642
1975	3 093	2 521	2 399
1976	11 934	3 101	5 107
1977	5 490	3 014	7 608

4. WATER RESOURCES

Summary of water balance: Average annual rainfall in Mizoram varies from 200 - 250 cm. The catchment area is about 21 087 sq. kms. (21 087 lakh hectares). Gross water available is 120,00,000 mg. Losses are estimated to be of the order of 30 to 40 percentage of total water available.

Ground water: Ground water potential in Mizoram is very negligible and is available in limited areas only like Kanhmun, Chawngte etc. Almost all the villagers depend upon spring sources located at far flung places.

Surface water: There are quite a few perennial rivers which flow through Mizoram but the following are the ones considered significant for the purpose of developing for drinking water supply source or for developing as irrigation water supply source or for developing hydroelectric power potential.

1.	Tlawng	6.	Tuikum
2.	Mat	7.	Tuirial
3.	Kolodyne	8.	Tuivawl
4.	Tuichang	9.	Tuiphal
5.	Tut	10.	Tuivai
		11.	Tuirini

The use of surface waters for drinking water is quite common in this territory as most of the water flows from virgin catchments. Rain

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

Total investment in the water supply and sanitation sector since the creation of the Union Territory in 1972, till March 1981 has only been about Rs.66, 681,000.

Planwise investment in the sector was as follows:

Last 2 years of IV Plan 1972-74	Rs. 6,984,000
Vth Plan 1974-70	Rs. 36,217,000
Annual Plan 1979-80	Rs. 4,555,000
1st year of Vith Plan 1980-81	Rs. 18,925,000

The population covered till March 1981 is indicated below:

Urban Water Supply	10,000 persons
Rural Water Supply	113,000 persons
Urban Sanitation	NIL persons
Rural Sanitation	NIL persons

6. SECTOR ORGANISATION

The head of Mizoram administration is Lt. Governor, Mizoram has got Legislative Assembly with thirty elected and three nominated members. The Cabinet is headed by a Chief Minister having four ministers. In Mizoram local bodies like municipalities has not been created. The maintenance of water supply schemes are done by the PHE Wing of PWD. About twenty-eight numbers of water supply schemes are presently maintained by the PHE Wing. Sanitation is almost non-existent in the urban and rural areas.

In Mizoram water supply and sanitation is looked after by the PHE Wing of PWD. PWD has one Chief Engineer and the PHE Wing is headed by a Superintending Engineer who has only four working divisions. The executing-divisions are poorly manned by technical personnel. The acute shortage of technical personnel in Mizoram is one of the main drawback in the PWD and PHE Wing. Some of the technical posts created are still to be filled up. There is a proposal of creating one more unit and getting technical personnel from other States. In the executing organisation Engineers are frequently shifted from the PHE Wing to the Road and Building Wings. As a result of this the works of PHE are greatly hampered. The government of Mizoram proposed to create the separate directorate of PHE from the year 1983-84. Creating separate department of PHE and strengthening the organisation is urgent for successful implementation of the Decade Programme.

7. DECADE PLAN & TARGETS

Description	Water Supply			Sanitation		
	Urban	Rural	Total	Urban	Rural	Total
1	2	3	4	5	6	7
Population served as on 31.3.81	10	113	123	-	-	-
Population to be served by the system exist						
Population to be served in 1981-90 by new system	74	339	413	67	113	180
Total population to be served as on 31.3.81	84	452	536	67	113	180
Total population to be served as on 1991	84	452	536	84	452	536
Percent coverage as of 31.3.1991	100	100	100	80	25	33.6

FINANCIAL TARGET FOR 1981-1990 (Cost Rs. in thousands)

New facilities Augmentation	28 786	351 820	380 606	20 100	5 650	25 750
Total	28 786	351 820	380 606	20 100	5 650	25 750

8. DECADE PROGRAMME FUNDING

Fund: The requirements of fund during the Decade Programme 1981-91 based on 1980 prices are as follows:

Urban Water Supply	Rs. 28 786 000
Rural Water Supply	Rs. 351 820 000
Urban Sanitation	Rs. 20 100 000
Rural Sanitation	Rs. 5 650 000
Total	Rs. 406 356 000

During the Sixth Five Year Plan the outlay for water supply and sanitation of Mizoram is Rs.1100.00 lakhs which is about 8.46% of the total fund outlay for Mizoram. Revenue generated in Mizoram is negligible. The fund required for water supply and sanitation in the Annual Plans of Mizoram are given as Central Government assistance. The additional requirement of fund

MIZORAM

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

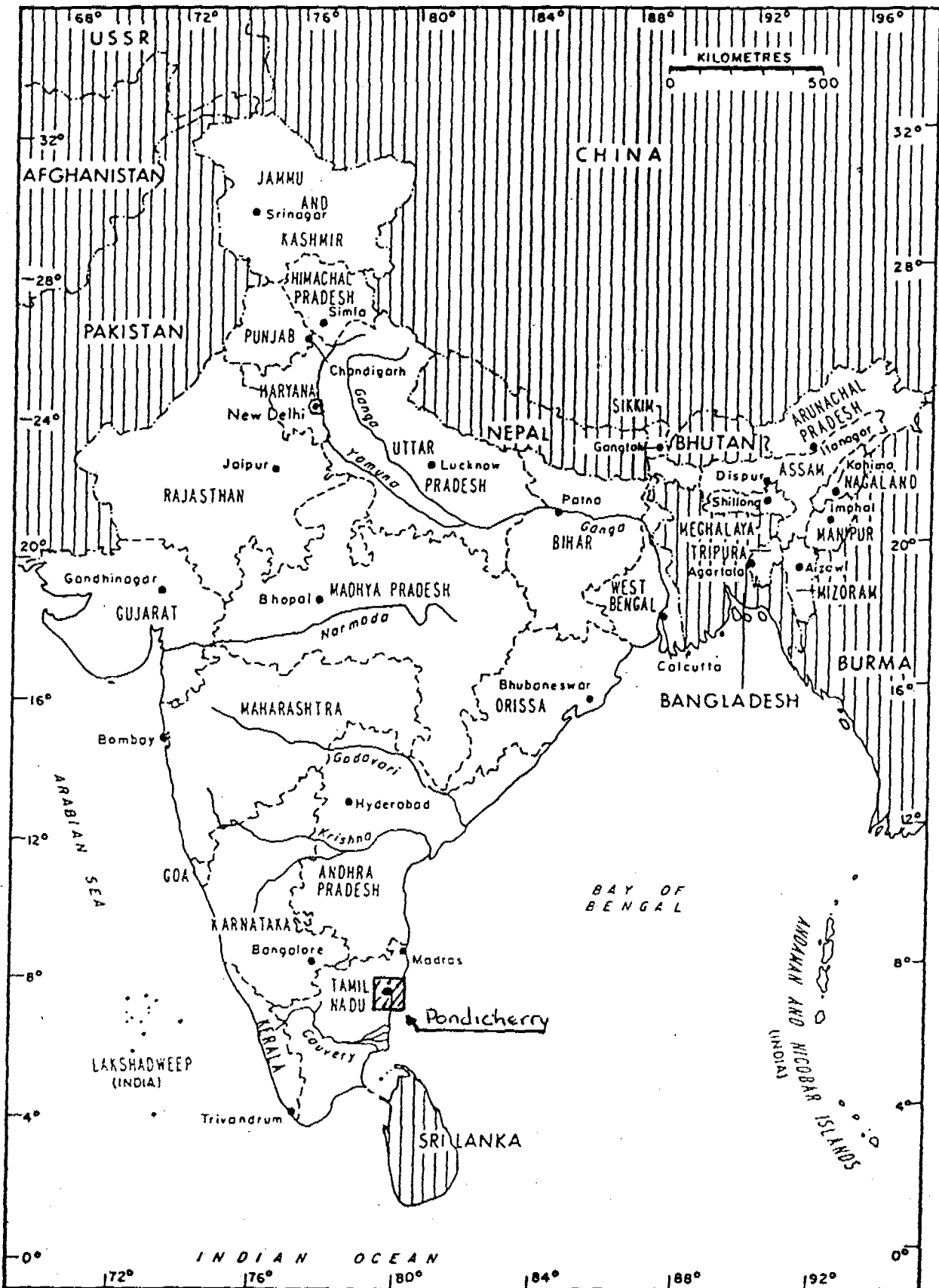
(Population and cost Rs. in thousand)

Year	Urban		Rural			
	Population to be covered	Capital cost to be utilised	Population to be covered		Capital cost to be utilised	
			RWS	RWC	RMS	RWC
1	2	3	4		5	
1981-82	NIL	1 936	10	NIL	11 693	
1982-83	NIL	5 000	18	4	17 400	
1983-84	25	1 850	24	12	25 000	
1984-85	NIL	2 685	31	25	16 879	
1985-86	NIL	6 000	30	25	44 471	
1986-87	19	7 000	40	48	44 293	
1987-88	30	4 315	50	50	46 496	
1988-89	NIL	NIL	45	50	47 096	
1989-90	NIL	NIL	46	50	49 456	
1990-91	NIL	NIL	45	50	49 036	
Total	74	28 786	339	339	351 820	

SANITATION

1981-82	NIL	187	NIL	NIL
1982-83	3	1 660	NIL	40
1983-84	5	2 700	14	200
1984-85	14	9 053	15	760
1985-86	7	1 000	15	700
1986-87	7	1 100	13	750
1987-88	7	1 100	14	800
1988-89	8	1 100	14	800
1989-90	8	1 100	14	800
1990-91	8	1 100	14	800
Total	67	20 100	113	5 650

UNION TERRITORY OF PONDICHERRY



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
PONDICHERRY

1. INTRODUCTION

The Union Territory of Pondicherry comprises of the following four regions:

1. Pondicherry forming an enclave in Tamil Nadu on the east coast about 160 km south of Madras.
2. Karaikal also forming an enclave in Tamil Nadu on the east coast about 310 km south of Madras.
3. Yanam a small enclave in Andhra Pradesh on the east coast of the estuary of the river Godavari, located at about 650 km north of Madras and 27 km south of Kakinada.
4. Mahe an enclave in Kerala on the east coast about 160 km south of Mangalore.

Pondicherry forming an enclave in Tamil Nadu on the east coast is the headquarters of the union territory. The area about 290 sq. kms in extent falls within North Latitudes $12^{\circ} 03'$ and $11^{\circ} 47'$ and east Longitudes $79^{\circ} 36'$ and $79^{\circ} 52'$. Pondicherry town is located at the centre of the area with a population of a little over 90,000 as per 1971 census. It is a minor port 160 km south of Madras. It is accessible by rail and road from neighbouring towns.

Climate: The climate is moderate in all the four regions.

Rainfall: Mahe region lying in the west coast which receive the highest rainfall of 3754 mm. The south west monsoon from June to September brings in a very heavy rain to this region. The other three regions lying in the East coast receives rain from October to December, from North east monsoon. The average annual rainfall in Pondicherry is 1199 mm, in Karaikal 1123 mm and Yanam 1077 mm. In normal years the rainfall is sufficient for irrigation purposes and for drinking water supply by replenishing the ground water storage.

Topography: Mahe lies in the hilly terrains of western ghats. Pondicherry, Karaikal and Yanam are located in the river deltas on the eastern coastal area. Most of the areas of the three regions are plain and low lying.

2. SOCIO-ECONOMIC INDICATORS

The total population of the Union Territory of Pondicherry comprising of Pondicherry, Karaikal, Yanam and Mahe region as per census of 1971 is 4,71,000.

The projected population for 1981 is 593 thousands of which 229,000 is urban and 364,000 is rural and for 1991 is 718,000. The urban population as per 1971 census is 198 thousand and the rural population is 273 thousands. The projected population figures for 1991 for urban population is 301.4 thousands and for the rural population is 413.6 thousands.

The growth rate of population in urban and rural areas during 1971-80 are 1.57% and 3.33% respectively. For the purpose of this master plan the growth rate during the span of the Decade 1981-90 is assumed as 3.19% for urban and 1.43% for rural population based on All India Pattern.

Income: The average per capita income of this Union Territory is Rs. 2,021/-. The index of per capita income is Rs. 239/-.

The literary rate as per the tentative figures of the census of India 1981 is 36.17% and that for Pondicherry is 54.23%.

3. HEALTH ASPECTS

The estimated mid year population of the Union Territory of Pondicherry for the year 1977 as per the abstract of statistic for 1977-78 is 4,34,000. The live birth rate verse 33.8 per thousand the death rate 9.5 for thousand is still birth 8.5 per thousand. The average life expectancy can be taken as 55 years. Infant mortality upto 4 years is high. The maximum death occurs in the range of 45 to 60 years.

The disease wise distribution of patients treated in various hospitals suffering from water borne and hespiratory diseases is given below in the table:

Details	1973	1974	1975	1976	1977
Disease-wise distribution of patients treated					
1. Cholera	11	12	-	-	-
2. Influenza	29202	27249	43251	19215	3754
3. Diarrhoea	119926	121333	119358	119727	106276

Endemic Disease: Cholera cases reported during the summer season, when there is acute scarcity of water, is on the decrease. However, there are several cases of Diarrhoea and dysentery. The incidence of Malaria is reported to be on the increase. The Medical Department with the assistance Vector Control Research Centre, Public Works Department and civic bodies is trying to control diseases transmitted by cectorm by trying to constrain their fast breading in open and polluted water bodies.

4. WATER RESOURCES

The total annual availability of water i.e. the gross potential in the Union Territory is estimated at 450 M.Cum. Million cubic meters based on the studies of the ground water cell of the Agriculture Department and based on the surface water flows available from the annual precipitation and the ground water storage.

Ground water of potable quality is available in good quantities in most of the parts of Pondicherry region, in Karaikal and Yanam regions. The ground water available is brackish in almost all places and hence we cannot depend on ground water sources. The net utilisable potential of ground water available due to limitation of extraction and economic viability is of the order of 310 M.Cum. The area that can be served by ground water is of the order of 63% and the population that will be served will be 72%.

There are no large rivers traversing the Territory. But the tail reaches of the rivers flowing through Tamil Nadu, Andhra Pradesh and Kerala States are flowing through these four territories before outfall into the sea. As such these rivers are subject to tidal efforts and the water in the considerable land is saline.

There are 87 fresh water lakes which are utilised for irrigation purposes. Many of these tanks receive water through diversion channels bifercating from anicuts or weirs across rivers in Pondicherry region. The remaining tanks are rain fed. The canals in Pondicherry region serve exclusively the irrigation needs. Canals in Yanam serve both water supply and irrigation. In Karaikal infiltration galleries constructed at the bed of the deltaio rivers serve the water supply needs. There are practically no hills streams as the regions are situated in coastal plains.

The total potential of surface water available is estimated at 100 M.Cum. out of which the net utilisable potential will be about 60 M. Cum.

5. PRESENT STATUS OF WATER SUPPLY & SANITATION

The population of the Union Territory and Service coverage as on 1981 is as furnished hereunder:

POPULATION

Category of Population.	As per 1971 census (in thousands)	Growth rate %	Projected for 1981 (in thousands)	Growth rate %	Projected for 1991 (in thousands)	Increase in the Decade (thousands)
1	2	3	4	5	6	7
Urban	198	1.57	229	3.19	302	73
Rural	273	3.33	364	1.43	416	52
Total	471		593		718	

SERVICE COVERAGE

Population covered as on 31.3.1981				Population to be covered in the Decade				Percentage cover by end of the Decade			
Water Supply		Sanitation		Water Supply		Sanitation		Water Supply		Sanitation	
Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1	2	3	4	5	6	7	8	9	10	11	12
174	255	120	-	128	161	121	104	100	100	80	25

6. SECTOR ORGANISATION

The Public Works Department is in charge of urban water supply, rural water supply and urban sanitation. It also looks after the operation and maintenance of urban water supply and urban sanitation.

The Municipalities/Commune Panchayat controlled by the Local Administration Department is looking after the operation and maintenance of rural water supply and urban and rural sanitation.

The Public Works Department is to look after the project identification, preparation of project report, execution, monitoring and evaluation of urban water supply, rural water supply and urban sewerage systems.

The operation and maintenance of urban water supply and urban sewerage system are taken by the Public Works Department where as the rural water supply and urban and rural sanitation is maintained by the Municipalities and Commune Panchayat.

7. DECADE PLAN TARGETS (POPULATION COVERAGE PROGRAMME)

The Urban Water Supply systems of this Union Territory dates back to the Ex-French Regime. The distribution lines laid about 60 years back in Pondicherry and Karaikal have outlived with the result of considerable reduction in residual pressure. The growth of urban population is abnormally high thereby posing a challenging problem in the near future if not met with adequate planning. The Decade Programme envisage for the laying of the distribution systems, augmentation of source and implement improvements to the existing systems. The Yanam water supply system will be developed with new distribution system and filtration process. The water supply to Mahe region will be arranged by extension of Anjarakondy scheme of Kerala Government. The additional population to be benefitted by this project will be 128 thousands thereby effecting 100% coverage of Urban population by the end of the Decade. The probable cost of investment will be Rs. 42804 thousands.

Rural Water Supply Projects: The rural population of this Union Territory in 1981 is estimated to 364 thousands out of which 255 thousands have been covered by the Rural Water Supply schemes leaving about 109 thousands yet to be covered. Adding the increase of 52 thousands in the next ten years with the left over population the additional population of 161 thousands will also be provided with clean drinking water supply by the Decade Programmes thereby making 100% coverage at the end of the Decade.

The estimated cost of investment will be Rs. 23540 thousands.

Urban Sanitation: At present sewerage system exists only in Pondicherry town covering a population of 120 thousands out of the total Urban population of 229 thousands. The Decade Programme envisage for providing a new sewerage system for karaika town and extending the existing sewerage facilities to the urban area of Pondicherry town. The additional population to be benefitted during the Decade will be about 121 thousands resulting in a coverage of 80% by the end of 1990. The estimated cost of the project is Rs. 39490 thousands.

Rural Sanitation: At present there is no proper sanitation arrangements made to the rural population of 364 thousands. The projected rural population in 1990 will be 416 thousands. The Decade Programme will provide adequate sanitary facilities to 104 thousands covering 25% of the rural population at the end of the Decade.

8. DECADE PROGRAMME FUNDING

The total estimated cost of the above schemes is Rs. 111034 thousands. The abstract of cost of investment for the Decade Programme is furnished hereunder:-

Details of Project	Population to be covered (in thousands)	Investment (in thousands)
A. Urban Water Supply	128	42804
B. Rural Water Supply	161	23540
C. Urban Sanitation	121	39490
D. Rural Sanitation	104	5200
	Total:	<u>111034</u>

The above investment is proposed to be met out of plan outlay during the Decade period as detailed below:

i) Out of the proposed plan outlay of Rs. 56800 thousands for the sewerage and water supply for 1980-85 as per draft VI Five Year Plan and Accelerated Rural Water Supply Programme the outlay for 4 years.	46925
ii) The proposed outlay for the sector in VII Five Year Plan	56530
iii) The proposed outlay for the sector in the 1 year of VIII Five Year Plan.	7579
Total:	<u>111034</u>

2. SOCIO ECONOMIC INDICATIONS

The total population of the State as per 1981 projection is 2.104 millions. Out of these total population the Rural population comprises of 87.4 of the total population while Urban population is only 12.6. The projected population as on 31.3.1991 which is the target year of completion for the Decade programme is 2.751 million and the Rural population comprises of 85.13% of the total while Urban population is only 14.87%.

As per National Sample Survey 83.8% of total population of this State are below poverty line. The G.N.P. of the State is Rs.14,642.0 lakhs at current price based on N.S.S. report during 1975-76 which has got a tendency of moderate rice comparing to sharp rice in many other States of the country. The per capita income is also having a moderate rise as this State is fully dependent on Central aid.

The main occupation in rural sector is agriculture and a small section is engaged in livestock, forestry, fishing, haunting and plantation, orchard and allied activities. The Urban population is engaged in other occupations but this comprises of a very small section of population. These occupations are mainly Household industry (manufacturing, processing, servicing and repairs) and other small industries construction, trade & commerce and transport, storage and communication.

As per 1981 census which has recently been carried out in the State the percentage of literacy in the State is 41.58% out of which 51.27% is amongst the males and 31.77% is amongst the females. The percentage of literates have increased considerably from 1971 census. In 1971 percentage of literate in the State was 30.98%. Percentage of literates in urban areas of the State as per 1981 census is 73.34% while that in rural areas is 37.8%.

3. HEALTH ASPECTS

The birth rate was 32.3 per thousand population during 1974-75. In the year 1975, 11,347 Nos. of total live births were in the State out of a total population of 15,56,342. During 1975-76 (Calender year 1976) the birth rate was 29.2 while during 1976-77 it went up to 33.0. Again there was a decrease in birth rate and during the calender year 1979 it was recorded as 34.7.

During the calender year 1973 total death from all cases in the State was 4434. The death rate during the calender year 1979 was 1072 per thousand population but infant death rate was 20.86 per thousand population. During 1975 the infant death was 17.30 per thousand.

Regarding diet and nutrition it may be mentioned that like most of the Eastern and North Eastern Zone the diet pattern of the people of

Regarding endemic; diseases it may be mentioned here that except some particular pockets the State is no longer affected by any endemic diseases like cholera, malaria etc.

4. WATER RESOURCES

The State has got considerable ground water potentiality in valley areas and therefore there is use of ground water for domestic & drinking water needs from the ring wells or masonar, wells, shallow or and deep tube wells. As per assessment of Central Ground Water Board on the basis of extensive exploration of Ground water resources the annual renewable discharge is 588 million Cubic Meter. The utilisation as on today 31.3.81 by both water supply & irrigation and also domestic and industrial use is less than 20 p.c. of total renewable ground water resources. Taking 70% of available ground water for irrigation, domestic and industrial use leaving 30 pc for water supply the available ground water shall be about 140 million cubic meter which is sufficient for catering 160 thousand urban and 1098 thousand rural population at rate of 140 lpcd and 40 lpcd respectively, supplemented by surface water flow.

There are 10 Nos. perenial rivers and 72 Nos. perenial streamlets throughout the Tripura. The annual run off is 0.80 million hectre metre out of which 0.1 million hectre metre flows through 8 Nos through non-monsoon months. But the water becomes tardy during monsoon due to heavy silt load. All the 10 Nos. towns of Tripura are situated on the banks of perenial rivers and thus can be covered by available surface flow with the help of suitable water treatment plant.

Most of the hilly villages with 15% population have to be covered by surface water flow from the nearby perenial streams by lifting and carrying through pipe with suitable treatment due to absence of underground water bearing strata.

Some of the villages situated on the top of Jampoi Hill range adjoining Mizoram State has to be provided by catching and preserving rain water as neither ground water be available nor lifting of surface water from long to distance and to high altitude is feasible for small scattered population.

5. PRESENT STATUS OF WATER SUPPLY AND SANITATION

As on 31.3.1981 safe drinking water facilities have been extended to the 105 thousand population of urban population and 741 thousand population of Rural population. The remaining 304 thousand population of Urban population by 1991 will be covered with safe drinking water supply during this decade. Regarding rural water supply remaining 1601 thousand population by 1991 will be covered with safe drinking water supply in this decade.

As on 31.3.1981 sanitation facilities have been extended to only two thousand Urban population. The remaining 326 thousand population by 1991 will be provided with safe sanitation facilities during the decade. Regarding rural sanitation the coverage is Nil as on 31.3.1981. Rural sanitation will be taken up for 586 thousand population of rural sanitation in between 1981-90 i.e., during the decade.

Out of 4727 Nos. villages drinking water facilities have been extended only in 2472 Nos. of villages upto 1.4.1981 out of which 251 Nos. villages by piped water supply from deep tubewell and 2221 Nos. villages by spot sources such as shallow tube wells, with hand pump, Ring well etc. The balance 2255 Nos. villages will be covered during this decade out of which 1018 Nos. villages by piped water from deep tubewell and 1237 Nos. villages by spot sources.

Out of 10 Nos. towns water facilities have been extended partially into 4 towns only (Agartala, Dharmanagar, Udaipur and Kailashahar) on 1.4.1981. The balance 6 Nos. towns will be covered and the existing 4 Nos. towns would be augmented.

Urban sanitation will be taken in all towns. Rural sanitation will be taken up only in about 500 Nos. populated villages. Coverage of population under water supply services have been fixed on the projected population of 1971 considering the standard growth rate. As on 31.3.1981 a total population of 846 thousand have been benefitted by water supply services, out of which 105 thousands are in Urban sector and the balance 741 thousands are in Rural sector.

6. SECTOR ORGANISATION

Agencies directly involved in the Sector under the Chief Engineer cum Secretary of Irrigation & Flood Control Department of Tripura Government, there are three working divisions dealing with all Public Health Engineering works in this State. There is also one special Investigation

Unit. All these four Divisions are placed under on Superintending Engineer who is also looking after the Design of Irrigation works. There is one Monitoring Cell which is directly placed under the Chief Engineer-cum-Secretary and is involved in Monitoring the progress of works, water quality and planning materials resources etc.

There is another organisation which is also looking after rural water supply works. This Rural Engineering Organisation is placed under Community Development Department and which is also looking after rural water supply works related to spot sources through Block Officers. This Organisation is responsible for execution and maintenance of these schemes.

7. DECADE PLAN TARGETS

During the Sixth Five Year Plan which forms a part of the Decade the total allocation of fund for 1980-85 as agreed by Planning Commission or Government of India is 17.27 crores, other than the allocation a separate allocation of Rs.3.195 crores approximately are anticipated as Central assistance by Government of India on Accelerated rural water supply programme.

The allocation of fund as agreed by Planning Commission for Sixth Plan is given below:

(a)	Urban Water Supply	Rs.4.22 crores
(b)	Rural Water Supply	Rs.12.00 crores. (This amount does not include Rs.3.195 crores to be provided by Govt. of India as Central assistance).
(c)	Urban Sanitation	Rs.1.00 crores
(d)	Rural Sanitation	Rs.5.00 lakhs

Total Cost

The requirement of fund for the Decade programme to achieve the above mentioned goals on the basis of this Unit cost would be about Rs.57 crores as under:

(a)	Urban Water Supply	Rs.1 094.40 lacs
(b)	Urban Sewerage and Sanitation	Rs.1 395.50 lacs
(c)	Rural Water Supply	Rs.2 917.04 lacs
(d)	Rural Sanitation	Rs. 293.00 lacs
		<hr/>
		Rs.5 699.94

Say Rs.57.00 crores.

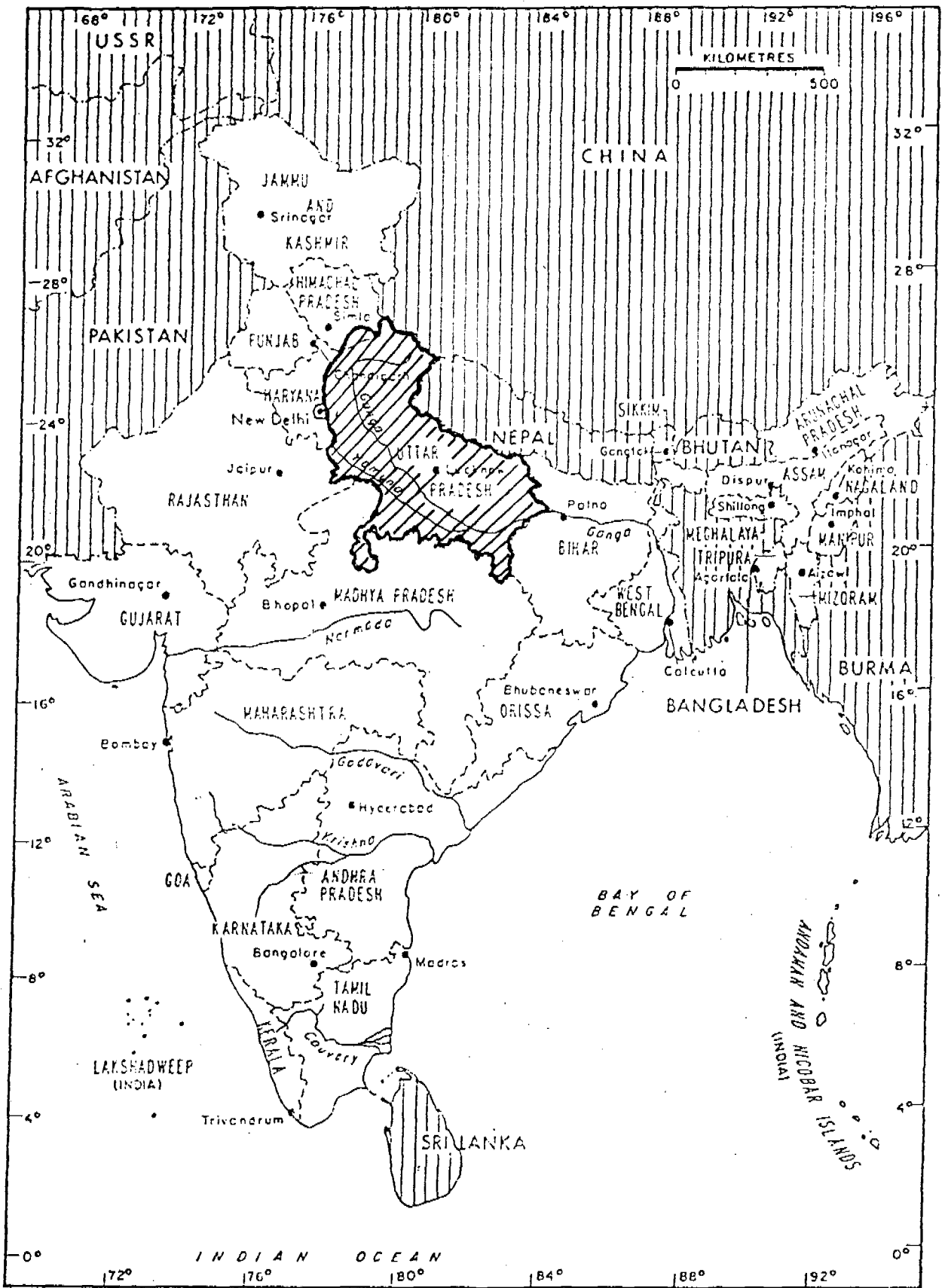
8. RESOURCE MOBILISATION

The proposed resource mobilisation is as under:

6th Five Year Plan allocation	2 046.50 lacs
7th Five Year Plan allocation (Anticipated 30% increase in the next Plan)	2 660.40 lacs
1st Year of 8th Five Year Plan allocation (Anticipated 40% increase in the next Plan)	593.10 lacs
L.I.C. other Sources & Inter- national donors	400.00 lacs
	Rs. <u>5 700.00</u> lacs

The phasing of the funds yearwise has to be done after discussion with the State.

STATE OF UTTAR PRADESH



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
UTTAR PRADESH

1. INTRODUCTION

The State of Uttar Pradesh is situated in the Northern Region of India. It is bounded by Nepal and Tibet in the North, parallel to Himalayan mountains, Bihar in the East; Madhya Pradesh in South; and Rajasthan, Haryana & Himachal Pradesh in the West. The Indo-Gangetic plain covers about two-third areas of the State and because of easily available supplies of surface and ground water, it has been the most populated area for centuries. The plain is watered by the Yamuna, the Ganga and its tributaries, the Ramganga, the Gomti, the Ghaghra and the Gandak rivers. The whole area of the plains is alluvial and very fertile.

The region parallel to the Himalayas comprises eight districts with high mountains formed of sedimentary rocks, broken by velleys and deep gorges. The perpetual snows in the higher reaches are the source of perennial rivers and rivulets which criss-cross the terrain and ultimately find their way into the Ganga and the Yamuna rivers.

The southern fringe of the Gangetic Plain is demarcated by the Vindhyan hills and Plateau. The Betwa and Ken rivers join the Yamuna from the South-West in this region where rainfall is scanty and erratic, resulting in less number of perennial water sources.

2. SOCIO-ECONOMIC INDICATORS

Uttar Pradesh has a population of 88.341 millions (as per 1971 census). The projected population figures for the year 1981 and 1991 are 105.728 millions and 122.114 millions respectively. The census population of 1981 is 110.88 millions.

The economy of the State is basically agrarian. People of all faiths and religions live in the State. The literacy rate in the State as per 1971 census has been estimated to 21.70 percent (31.50 percent of males and 10.55 percent of females) against the national average of 29.45 percent. The per capita income in Uttar Pradesh during the years 1977-78, 1978-89 and 1979-80 at current prices have been Rs. 952.00, Rs. 977.00 and

Rs. 995.00 respectively which show a gradual rising trend. According to an assessment of the Planning Commission, Govt. of India, 58% of urban and 50.82% of rural population of India is below the poverty line (Based on analysis of consumer expenditure data for 77-78). In U.P., 49.24% of urban and 50.23% of rural population falls under this category.

3. HEALTH ASPECTS

In Uttar Pradesh, food consumed by the human beings, consists of cereals, sugar and jaggery in adequate quantities where as intake of other foods is below the recommended levels. The consumption of leafy vegetables, fruits, flesh foods and fats & oils is very low.

The average life expectancy in Uttar Pradesh was 61.1 and 59.8 for male and females respectively as per data available for 1978. The birth and death rates per 1000 population in Uttar Pradesh for 1978 was 29.1 and 10.8 respectively. Morbidity and mortality in U.P. because of various diseases including water and faecal born diseases during 1980 are as following:-

	All type of dysen- terary	Enceph- alitis	Enterim fiver	Gastro enter- itis	Guinea worm	Infective Hepatit- ies	Influe- nza
Morbidity	40585	8285	30024	1678	5337	10145	50115
Mortality	202	127	45	20	193	210	5

4. WATER RESOURCES

By far the most important area for the economy of the State is the Gangetic Plain which stretches across the entire length of the State from East to West. It is watered by the Yamuna, the Ganga and its major tributaries, the Ramganga, the Gomti, the Ghagha and the Gandak. The whole plain is alluvial and fertile.

A survey of the total surface water resources of the Ganga basin is being done by the Central Water Commission, Govt. of India. But the estimate puts them at about 462 lakh hectare metres, of these 330 lakh hectare metres passes through the State.

As per information collected from Ground Water Investigation Organisation, U.P., the total gross Recharge and net recoverable recharge is about 89100 million cum and 62400 million cum respectively. Total draft and net draft is 26500 and 18500 million cum respectively.

Average percentage of utilisation is 29.78%. On regional basis, the ground water being extracted in Western, Eastern, Central and Bundelkhand regions is about 45%, 25%, 28% and 20% for future development of ground water structures.

5. PRESENT STATUS WATER SUPPLY & SEWERAGE

Urban Water Supply: Out of 644 urban areas of the State, 434 have been provided with piped water supply benefitting 13990 thousands population (88.8%) upto the end of March 1981 and the work in 92 towns is in progress.

The surveys conducted by M/s Kirloskar Consultants and the Tariff Units of the Jal Nigam have revealed that the population served by the house connections and the stand posts generally vary from 25%, to 50% and 20% to 40% respectively. The remaining population takes water from captive sources viz. Wells, hand pumps and rivers.

The water supply in most of the towns of the State is intermittent with supply hours varying from 4 to 20 hours per day depending upon the availability of power. The service levels vary from town to town with a definite trend that in the bigger towns per capita consumption is higher. The per capita supply in corporation towns ranges between 200 to 270 lpcd. In the medium towns of about 1 lac population per capita supply is in the range of 150 to 175 lpcd. The supply in the small towns is low in the order of about 70 to 150 lpcd.

Rural Water Supply: Out of 1,12,561 villages in U.P., 11602 villages have been covered by the end of March 1981 benefitting a population 6487 thousands (Approx 7.2%). Total No. of problem villages in 35,506 covering a population of 26909 thousands, out of which 7913 villages with the populations of 4200 thousands (15.6%) have been covered by the end of March 1981.

The studies carried out by the Tariff Units of the Jal Nigam, reveal that per capita supply in rural areas in case of persons drawing water from the private connections is in the order of 60 to 70 lpcd. While for those who take water from the public stand posts, it ranges between 35 lpcd to 50 lpcd. Except in gravity schemes, where the water is supplied continuously, the supplies are intermittent. The timings of supply of water are in the morning and evening with an average of 6 to 8 hours per day.

Urban Sanitation: Out of 644 towns of the State only 45 towns were provide with partial sewerage facilities benefitting 2562 thousand population (16.26%) till the end of March 1981.

No programme has been taken up by the end of March 1981 regarding construction of water seal toilets connected to septic tanks and soak pits. Though some population have provided water seal toilets at their initiative.

Rural Sanitation: In this field, the work done is negligible and there is no such system existing in the villages which can be termed as having any measure of sanitation outlook.

6. SECTOR ORGANISATIONS

The Urban Development Department (Nagar Vikas Vibhag) is responsible for the development of the urban sector and rural water supply and sanitation for the State at the level of the Government. The U.P. Jal Nigam (U.P. Water Corporation, Jal Sansthans (Water Boards), Zila Parishads (District Boards) and Local Bodies (Corporations, M.B., TAC, NAC) are responsible in the field for water supply and sanitation.

UP Jal Nigam: The UP Jal Nigam is a State organisation constituted in the year 1975 by Govt. legislation with its headquarters at Lucknow and Zonal, Circle and division offices located at different places of the State. Nigam is headed by a full time chairman and consists of two other full time members (managing Director and Finance Director), four ex-officio members (Secretaries of Finance & Nagar Vikas, Director, Local Bodies and Director of Medical & Health Services) and five elected heads of the local bodies nominated by the State Govt.

Jal Sansthans: According to U.P. Water Supply and Sewerage Act 1975, the State Govt. by a notification can create Jal Sansthan for any particular area or a town to entrust responsibility of the sectoral functions. As present, there are eight Jal Sansthans viz. Garhwal, Kumaon, Bundelkhand, Kanpur, Allahabad, Varanasi, Agra and Lucknow. A Jal sansthans is headed by a chairman who will be the Mayor of the town in case of urban Jal Sansthan and the commissioner of the division in case of Regional Jal Sansthan. Executive head of a Jal Sansthan in a General Manager to be appointed by the Jal Nigam with the approval of State Govt.

Zila Parishad: A Zila Parishad is an elected body for every district headed by an elected chairman and in responsible for rural development works in the district.

Local Bodies: Local Bodies i.e. the Corporations, Municipal Boards, Town Area Committees, Notified Area committees are governed by the UP Municipalities Act 1976. Every Municipality has an elected body which consists of a president, 20 to 80 elected members and 4 to 8 co-opted members as prescribed by the State Government.

The institutional responsibilities of various organisations for providing water supply and waste disposal services to rural and urban areas have been shown in the following table:

Sl. No.	Institution	Institutional Responsibilities									
		Survey Investigation & Design		Execution		Operation and Maintenance		Monitoring of the system		Monitoring of the Water Quality	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1.	UP Jal Nigam	UPJN	UPJN	UPJN	UPJN	-	UPJN (only 18 dis-tricts)	UPJN	UPJN	UPJN	UPJN
2.	Regional Jal Sansthan	UPJN	UPJN	UPJN	UPJN	RJS	RJS	UPJN	UPJN	UPJN	UPJN
3.	Jal Sansthan (5 corporation towns)	UPJN	-	UPJN	-	JS	-	UPJN	-	UPJN	-
4.	Local Bodies	UPJNLB	-	UPJNLB	-	LB	-	UPJN	-	UPJN/DMH	-
5.	Zila Parishad	-	UPJN	-	UPJN	-	ZP	-	UPJN	-	UPJN

UPJN - U.P. Jal Nigam, RJS - Regional Jal Sansthan, JS - Jal Sansthan, LB - Local Bodies, ZP - Zila Parishad, DMH - Directorate, Medical & Health Services.

7. DECADE PLAN TARGETS

Sub-sector wise target population to be served during the decade by the end of March 1985 and March 1991 is as following:

Water Supply		Population in thousands			
Sl. No.	Sub Sector	Population to be served			
		By the end of March 1985		By the end of March 1991	
		Urban	Rural	Urban	Rural
1.	Water Supply	2538	24460	13912	96285
2.	Sanitation	4376	-	15472	25692

8. DECADE PROGRAMME FUNDING

The sub-sector wise requirement of funds for the Decade programme (at 1980 price level) is as following:

Sl. No.	Sub-Sector	Requirement of funds		
		Requirement of funds		Total
		Urban	Rural	
1.	Water Supply	2072480	9961380	12033860
2.	Sanitation	3064775	1284600	4349375
	Total	5137255	11245980	16383235

Mobilisation of Resources: Urban water supply & sanitation schemes are executed by Jal Nigam as deposit works on behalf of local bodies. If required by local bodies, financial assistance is given to them in the shape of loan/grant by the Jal Nigam, which is financed by State Govt. and L.I.C. of India. Rural Water Supply schemes are financed by State/Central Govt. as 100% grant or 75% grant and 25% loan. Efforts will also be made to get loan from the Housing and Urban Development Corporation (HUDCO) and other similar organisations also.

In the past years, some International Agencies like World Bank, Dutch Govt. have given financial assistance to various Water Supply and Sanitation Schemes. In order to meet the targets of the Decade, more efforts shall be made to obtain financial assistance from the various International Organisations/Bilaterals.

The allocation for the sector in the State during the VI five year plan (1980-85) is Rs.372.285 crores (including Rs.83.785 crores of central assistance under ARWSSP). Out of this amount Rs.54.668 crores was spent during 1980-81 which was not covered in the decade programme. Therefore only an amount of Rs.317.617 crores is available for the decade programme during 1981-85. Similarly an amount of Rs.1320.7065 crores will be needed during the 7th plan and first year of the 8th plan to reach the targets.

9. SUPPORT PROGRAMMES

Financial Resources: To achieve the target set for the Decade Programme, the State requires much more financial allocations. The resources made available for this programme are grossly inadequate in comparison with the ambitious targets set under this programme. To overcome this borrowing from financial institutions and seeking international and bi-lateral assistance could be a practical possibility, besides ensuring that the water supply sector is put into the core sector and given priority over other sectors.

Technical Manpower: Practically all the materials required for urban and rural water supply and sanitation works are manufactured in the country. Further increased quantities can be made available in sufficient quantities by increasing the production capacities of the existing units as also by setting up of new units as and when required.

Operation and Maintenance: For maintenance and operation, the urban local bodies the KAVAL Jal Sansthan and the Regional Jal Sansthan have the necessary statutory powers. A large number of systems, even the water supply are not self supporting in respect of maintenance and operation as the revenue on present tariffs are not sufficient. Any increase in tariff is usually opposed and resented by the public.

Inter-sectoral Coordination: The works in the water supply sector have primarily to depend upon the co-operation of Irrigation, Public works State Electricity Board and Forest Departments and also the District Administration. The Jal Nigam has no statutory rights over the natural waters like rivers and lakes and therefore permission of Irrigation Department is required for tapping of water sources. Similarly for laying of water mains and sewers along highways

and roads of villages and towns, permission of the Public Works Department and local bodies is required. In rural areas and especially in hills, permission of Forest Department is essential for laying of water mains, construction of reservoirs etc. in forest areas similarly co-operation of State Electricity Board is also very essential for obtaining power connections to the water supply and sewerage systems. No particular bottleneck has been experienced in obtaining the required co-operation from these Departments.

Health Education & Community Participation: The population of the State, urban in general and rural in particular is very superstitious and highly inclined towards religion. The State Govt. is taking every possible steps to educate public. Health education is being imparted to them through video-media, slides and radio-transmission etc. Medical Information and other departments have been entrusted for the job. Several programmes likes Nutrition Programme, Integrated Rural/Urban Department Programme, Hygienic & Sanitation Programmes for Schools etc. have been taken up by the State Govt. for the betterment of the health of the people.

UTTAR PRADESH

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	718	215460	1280	423570
1982-83	703	214926	5592	479850
1983-84	615	218380	6618	984900
1984-85	502	200000	10970	1256560
1985-86	1830	201500	11850	1130000
1986-87	1850	207600	11900	1131500
1987-88	1875	203820	11950	1135000
1988-89	1900	208600	12010	1137000
1989-90	1935	203500	12040	1137000
1990-91	1984	198694	12075	1146000
Total	13912	2072480	96285	9961380

SANITATION

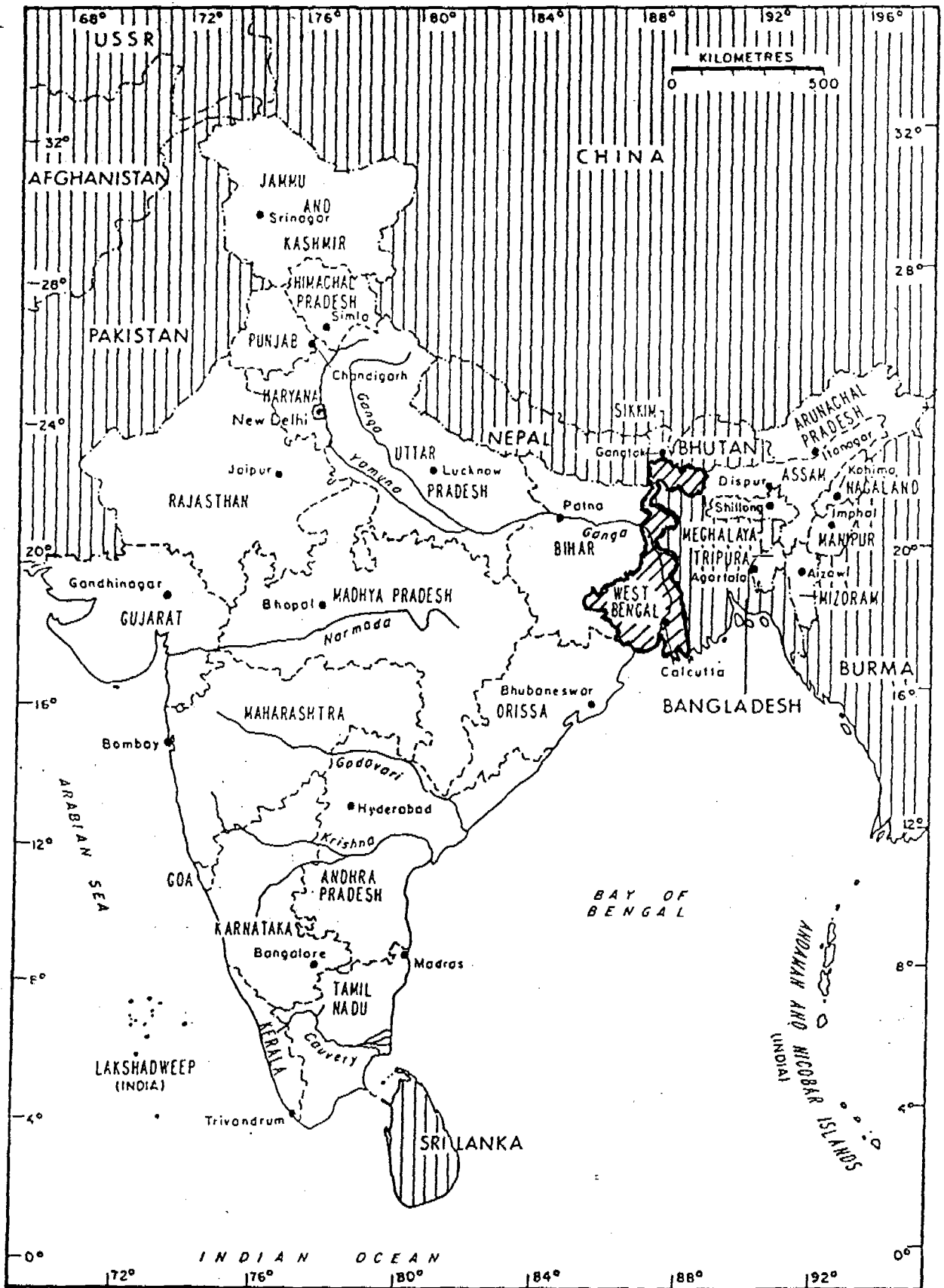
1981-82	811	18820		
1982-83	1046	30370		
1983-84	1115	28645		
1984-85	1404	143215		
1985-86	1525	328725		
1986-87	1650	375000	4650	214000
1987-88	1835	440000	4834	235000
1988-89	1928	515000	5150	256200
1989-90	2015	570000	5320	280000
1990-91	2143	615000	5738	298400
Total	15472	3064775	25692	1284600

Note: 1. The provision in the State Sixth Five Year Plan for urban water supply urban sanitation and rural water supply are Rs.60.00 crores, Rs.25.00 crores and Rs.203.50 crores respectively. In rural water supply in addition to above provision Rs.83.785 crores are likely to be available by the Central Govt. Under Accelerated Rural Programme.

Additional funds above the provisions in the Sixth plan are likely to be available.

2. The figures for the year 1981-82 and 1982-83 are actuals.

STATE OF WEST BENGAL



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
WEST BENGAL

1. INTRODUCTION

Population of West Bengal in 1971 was 44.223 millions. Nearly 75% of this population live in villages and 19% live within the Calcutta Metropolitan District of Calcutta. The density of population (1971) within the Calcutta Metropolitan District was 10987 persons per sq. kilometer and in other urban areas was 2746 persons per sq. kilometer. The average density of population (1971) in rural - West Bengal was 388 persons per sq. kilometer.

The geographical location of West Bengal is such that there is the Himalayan mountain range passing through the north, the Bay of Bengal lies to the south, the hard rock formation of Chhotanagpur plateau extends to the Western part of the State, Sub-Himalayan (foot-hill) areas comprise the Dooars and the Indo-Gangetic plains are in the east.

2. SOCIO-ECONOMIC INDICATORS

Break-up of Urban and Rural population of the State is given below for 1971, 1981 and 1991.

Population in 000's

	1971	(Projected) 1981	(Projected) 1991
Urban	10942	15148	16241
Rural	33281	40777	50251
Total:	44223	55925	66492

Growth rates & Migration

Percentage of growth rates for 1971-1981-1991 of population in West Bengal are stated below:

	1971-81	1981-91
Urban	3.84	0.72
Rural	2.25	2.32

Estimated growth rate between 1981 and 1991 for rural area in West Bengal is higher than that in urban area for the simple reason that influx of population from rural to urban areas is expected to be inhibited by virtue of the developmental works in various sectors now under execution through Panchayats and also through various Departments of the Govt.

West Bengal's economy is primarily based on agriculture which accounts for about 35% of the State's income. Total earning from industry is about 25% of the State's income. Per capita income of West Bengal was estimated to be Rs. 1302.00 for 1977-78. Per capita income for previous years is given below which indicates an increasing trend of per capita income of the State:

Years	1970-71	1973-74	1974-75	1975-76	1976-77
Per capita income in Rs. (Current prices)	737.00	936.60	1072.50	1083.10	1143.40

3. HEALTH ASPECTS

Expectation of life at birth 1961 and 1971 for East Zone

	<u>At age at birth</u>	<u>East Zone</u>
Male	1961	39.78
	1971 ^a	45.97
Female	1961	40.05
	1971	42.76

Source: Life Table, Census of India 1971 series 1 India (Paper 1 of 1977)

Morbidity and Mortality

Vital indices based on reports received from the Registration Units under statutory registration systems, West Bengal, 1974-1978

Year	Births	Rate per 1000 Population						
		All cases	Cholera	Small pox	Dip-theria	Dysentery & Diarrhoea	Pulmo-nary TB	Malaria
1974	12.6	5.6	0.02	0.02	0.01	0.48	0.17	0.002
1975	13.2	5.8	0.01	0.001	0.012	0.48	0.17	0.004
1976	13.7	5.0	0.003	-	0.009	0.36	0.16	0.002
1977	13.1	4.6	0.002	-	0.01	0.29	0.16	0.001
1978	12.5	4.6	0.002	-	0.01	0.29	0.16	0.001

Source: State Bureau of Health Intelligence Directorate of Health Services, West Bengal.

Cholera is endemic in West Bengal. It has also been the focus of attention of cholera for other parts of the country. Water borne diseases like typhoid, dysentery and gastroenteritis are common in the State.

4. WATER RESOURCES

Ground water in the upper aquifers in the coastal region in the south is saline. Ground water in the Dooars area contains excessive iron and the extensive boulders present there necessitate use of cable-tool rigs for construction of tubewells by percussion system. D.T.H. rings are needed for construction of tubewells in the hard rock areas in the west.

The river Ganges flows west to east through the middle of the State and passes into Bangladesh. It was found necessary to divert sufficient quantity of water from the Ganges to the Bhagirathi for reduction of salinity and siltation in the Bhagirathi Hooghly - river system which is tributary of the Ganges. The river-Subarnarekha rises in Chhotanagpur and flow in a south-easterly direction to the Bay through Bihar, Orissa and West Bengal. There is a tripartite agreement amongst these States for distribution of the water of the Subarnarekha. The rivers Teesta, Torsa, Jaldhaka etc., in North Bengal flow to Bangladesh. The flows in the rivers Damodar and Kansabati are regulated and controlled by dams mainly for the purpose of irrigation. There are also proposals for regulation and control of the flows in the rivers Mahananda and Ajoy for similar purposes. Most of the other rivers in the State carry little flow during the summer.

5. PRESENT STATUS OF WATER SUPPLY AND SEWERAGE

According to 1979 census report there are 3 municipal corporations, 31 municipalities and 63 non-municipal urban areas (constituting 16 urban communities) and 544 villages within the Calcutta Metropolitan District. Outside this district there are 118 urban communities and 37530 villages in the State. Except in the hill areas of Darjeeling District, drinking water is drawn by the people in the villages from tubewells fitted with handpumps in the alluvial zone and from masonry or ringsells in the hard rock areas. Implementation of Piped Water Supply schemes for supplying drinking water to the villages have been introduced recently and 792 villages have been provided with piped water supply system till 1.4.1981. 3 urban communities - within Calcutta Metropolitan District and 66 urban communities outside are yet to be served with the facility of Piped Water Supply. In other urban communities the level of service is much below the standards recommended by the Ministry of Works and Housing, Government of India.

Urban Water Supply

Coverage: There are 134 urban communities in West Bengal according to 1971 census report only 65 nos. have organized piped water supply systems though service levels are much below the standards specified by the Ministry of Works and Housing, Government of India. The entire population of those 65 urban communities are not however served by the existing systems. This has necessitated provision of hand operated tubewells in the above mentioned 65 urban communities including Calcutta, in addition to the Piped Water Supply systems.

Water for domestic purposes in remaining 69 urban communities is to be procured from hand operated tubewells and community ring-wells. Many of the towns have no dependable underground water source. In some places construction of tubewells may be feasible but life of such tubewells may not be long enough. Upto 31.3.1981, 57.20% of the urban population was served with safe drinking water supply facilities.

In cases where the community is under the administration of municipality, used water is, generally disposed into the surface drains constructed by the municipality. In other cases, open kutchra drains are the only passage for the disposal of waste water from house premises.

Only 14.8% of the urban population has the sanitation facility. Remaining population disposes their body wastes either in privately owned Bucket Latrines, Sanitary Latrines or they resort to indiscriminate defecation in nearby open space or drains.

Rural Water Supply

Coverage: As per 1971 census report the number of villages in West Bengal is 38074 with a population of 33281 thousands. Out of the above 544 are included in CMDA.

A total of 6439 thousand of population spread over 5176 nos. of villages have been covered by Rural Water Supply System upto 31.3.1981. Such coverage has been done by piped as well as spot water supply systems. Out of these villages only 792 have been fully covered and no further work has to be done during the Decade. Villages where spot sources have been provided, would require creation of further new facilities within the Decade.

People in rural areas depend on spot tubewells where they exist at a reasonable distance from their place of residence. A revenue mouja in West Bengal comprises of a no. of hamlets spread quite a long distance apart and therefore, although living in the same revenue mouja where a spot source exists, people in other hamlets can not take advantage of the protected water supply facilities. In such cases and in cases where no such facility is at all available people have resort to rivers, open ponds and shallow ring wells for their drinking, bathing both human and cattles and various other domestic and non-domestic purposes. During the summer months these sources again go almost dry and the sufferings of the rural people cannot be measured by any yardstick. As rural sanitation is very insignificant in the State, people have to take recourse to indiscriminate defecation in nearby lands - which in turn contaminate the sources of water they use for domestic and non-domestic purposes. Besides, with the increase of chemical fertilisers and pesticides for agricultural purposes, the surface sources, people use are never without danger of possible pollution.

6. SECTOR ORGANISATION

There is an infrastructure for planning and execution of projects in the Public Health Engineering Directorate of the State under the Department of Health & Family Welfare, Working Divisions of this Directorate are existing in almost all the districts. In some bigger districts, there are more than one working divisions. The working divisions of this Directorate are placed under seven circles. The Survey, Investigation, Planning and Design Divisions are placed under one circle only. At present two Chief Engineers direct and guide the activities of the Public Health Engineering Directorate.

Planning and implementation of projects within the Calcutta Metropolitan District are done by a separate statutory authority - C.M.D.A. In C.M.D.A. there are two Director General of Operations. The organisations controlled by it, have Chief Engineers-in-charge of Planning and implementation of projects. Planning of some projects in urban communities outside Calcutta Metropolitan District is done by the Municipal Engineering Directorate under the Local Govt. - and Urban Development Department.

While all the organisations listed above would be involved in the detailed planning and implementation of the Decade Programme the major work will be done by the P.H.Engineering Directorate.

The present set up of the sector organisations is not adequate to achieve the objectives and target of the Decade programme. It would be absolutely essential to strengthen all the sector organisations to cope with the increased volume of work.

7. DECADE PLAN & TARGETS (POPULATION COVERAGE POSITION)

It is the objective of the International Drinking Water Supply & Sanitation Decade Programme to provide every citizen with safe drinking water during the Decade 1981-91. In the sphere of Sanitation the objective is to cover 80% of the urban population and 25% of the rural population with hygienic disposal of human excreta including sewerage facilities for all class I urban communities.

To fulfil these objectives, it would be the target of the State to make proper arrangement for drinking water supply to 37,282 villages. New Water Supply Systems are also to be provided to 69 urban communities and the service level in the remaining 65 urban communities - would have to be raised to appropriate standards as recommended by the Ministry of Works & Housing, Govt. of India. It would be necessary to install sewerage systems (with sewage disposal arrangement) in 10 class I urban communities in the State with a target population of 8741 thousands. House-hold latrines with septic tanks are to be provided in 23 other urban communities with a target population of 2009 thousands.

8. DECADE PROGRAMME FUNDING

With the targetted coverage and service levels indicated against each, the following are the investment costs for different sub-sectors

	Targetted Coverage (population in 000's)	Investment cost (Rs. in crores)
a. Urban Water Supply	16241 (7576 + 8665) New Aug	262.24
b. Rural Water Supply	43302	501.43
c. Urban Sanitation	10750	506.37
d. Rural Sanitation	12563	62.82
Total		1332.86

A statement showing fund allocation for the sector during the Vith Plan period (1980-1983) is given below:-

(Rupees in thousands)

	Urban Water Supply	Rural Water Supply	Urban Sanitation	Rural Sanitation	Total
1980-81	102430	85076	19528	4000	211034
1981-82	95185	134858	14263	3000	247306
1982-83	135397	180750	12900	2500	331547
Total	333012	400684	46691	9500	789887

Two separate statements for C.M.D.A. and the State showing allocation of fund during the VIth Plan Period (1980-85) for Water Supply - Sanitation and other important Social services sectors indicating percentage of such allocation to total plan provision are furnished below:

	Allocation of fund Rs. in crores during VIth Plan (1980-85)	Percentage to total Plan provision
<u>C.M.D.A.</u>		
Total Plan Provision	276.00	100
1. Water Supply	47.29	17.13
2. Sanitation	7.75	2.81
3. Traffic & Transport	42.29	15.32
4. Area Development	39.22	14.21
5. Busty Improvement	24.78	8.98
6. School	1.87	0.68
<u>WEST BENGAL</u>		
Total Plan Provision	3660.00	100
1. Sewerage & Water Supply (including Central Assistance)	96.00 36.00	2.62
2. Health	79.00	2.16
3. Agriculture	321.45	8.78
4. Irrigation & Water Ways	400.00	10.93
5. Power	844.17	23.06
6. Public Works (Metropolitan Development)	260.00	7.10
7. Home (Transport)	155.00	4.23
8. Public Works (Road)	90.00	2.46
9. Education	263.00	7.19

Resource Requirements

Additional resources required to reach targets by end of the Decade are indicated below:-

(Rs. in crores)

	Financial target for the Decade	Resources available during 1981-85 as per VIth Plan provision	Additional resources required to reach targets by end of the Decade(31.3.1991)
Urban Water Supply	262.24	68	194.24
Rural Water Supply	501.43	87	414.43
Urban Sanitation	506.37	9	497.37
Rural Sanitation	62.82	1	61.82
Total:	1332.86	165	1167.86

Possible Sources (Internal)

Total additional resources required during the last six years of the Decade (1985-1991) cannot be ascertained before the VIIth Plan provisions are made known. However, attempts are being made to obtain institutional finance from within the country (from Life Insurance Corporation of India, Housing & Urban Development Corporation, Commercial Banks, etc.) for the sector and if available, these resources may be suitably adjusted even within the VIth Plan period. In that case physical and financial targets for the period 1981-82 to 1984-85 have to be set afresh to accommodate available additional resources.

Possible Sources (External)

Projects in CMDA are being partly financed by the World Bank under IDA Schemes and it is expected that World Bank loan would be forthcoming in future also for projects in CMDA to develop the Water Supply and Sanitation Sector of the only metropolis in Eastern India. Negotiations are being conducted between the World Bank and the CMDA so as to leave no resource gap at the end of the Decade for Projects within Calcutta Metropolitan Development Area.

Attempts are also being made to finance projects outside CMDA with World Bank loan to reduce the plan provisions required during the last six years of the Decade to achieve the financial targets.

Other Possible Resources

Negotiations are being carried out by the Govt. of India with friendly countries for proposing a few schemes under Bilateral Assistance Programme.

International Drinking Water Supply and Sanitation Decade 1981-91

ANNUAL PHASING OF DECADE PROGRAMME

(Population and cost (Rs) in thousands)

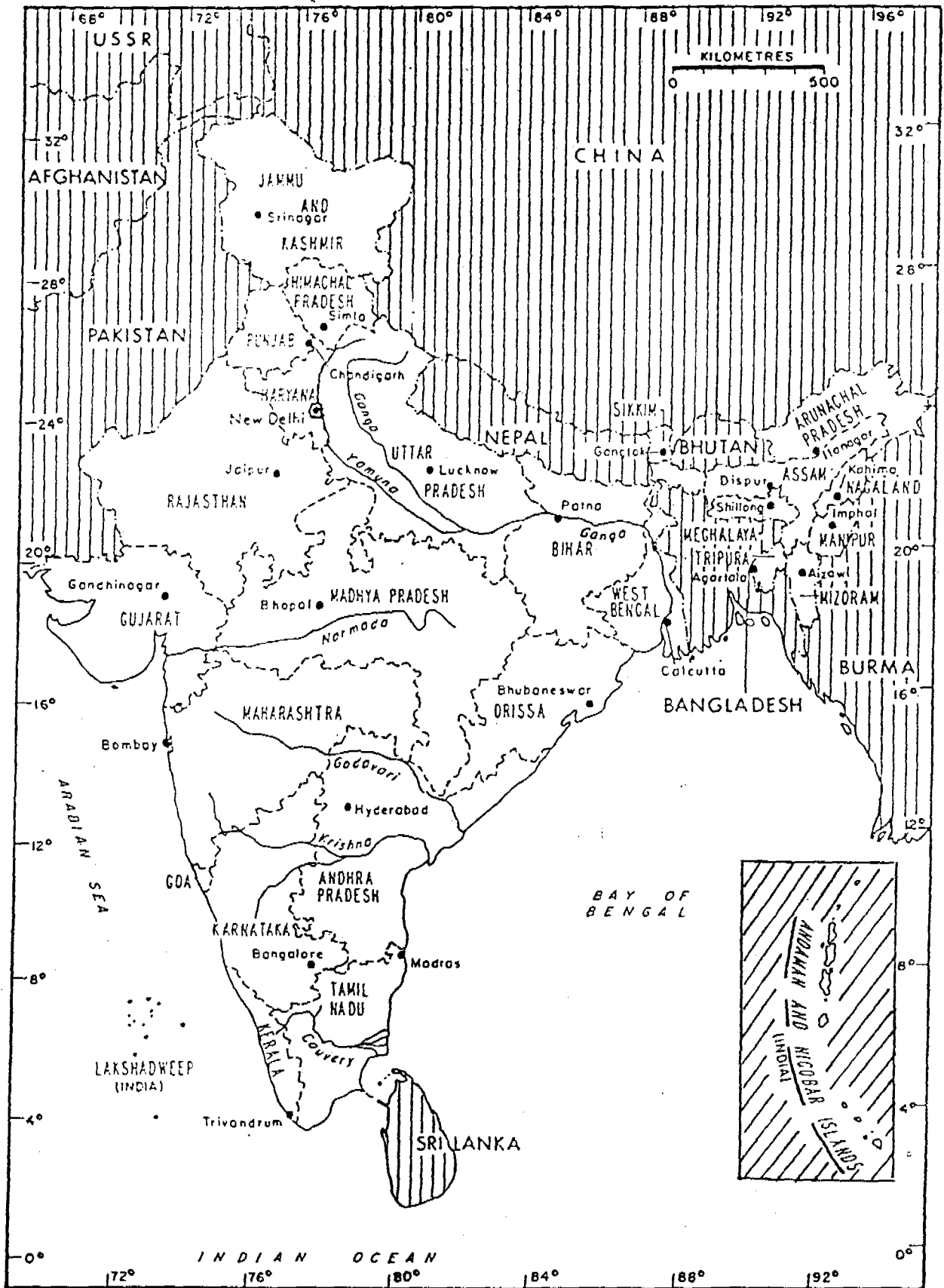
A. WATER SUPPLY

Year	Urban		Rural	
	Popln. to be covered	Capital cost to be utilised	Popln. to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	1154	95185	1256	134858
1982-83	812	135397	1783	180750
1983-84	700	128439	5009	242228
1984-85	1252	318099	10966	313938
1985-86	2584	243284	3915	668308
1986-87	2486	310064	3915	668309
1987-88	1509	317526	3915	712535
1988-89	1729	359118	3878	712535
1989-90	1999	359118	4178	712535
1990-81	2016	356190	4487	
Total:	16241	2622420	43302	5014305

B. SANITATION

1981-82	69	14263	60	3000
1982-83	62	12900	50	2500
1983-84	94	18828	41	2060
1984-85	237	47448	59	2940
1985-86	1874	890852	2048	102400
1986-87	1873	890008	2070	103500
1987-88	1872	889796	2065	103250
1988-89	1488	767916	2064	103200
1989-90	1333	765845	2064	103200
1990-91	1848	765844	2042	102100
Total:	10750	5063700	12563	628150

UNION TERRITORY OF A & N ISLANDS



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
ANDAMAN AND NICOBAR ISLANDS

1. INTRODUCTION

Andaman and Nicobar Islands is a Union Territory situated in the Bay of Bengal. This territory having an area of 8293 sq. km. consists of about 500 Islands out of which only 36 are inhabited. Port Blair, the only town and urban agglomeration, is the capital. The rest of the habitation is in rural area consisting of 390 villages. This Union Territory is under the direct administration of Government of India through a Lt Governor and an advisory council.

The Islands of Andaman and Nicobar receive rainfall from both the South-West and North-East monsoons. The major portion of the precipitation is received from the South-West monsoon. The rainfall is quite heavy, ranging from 2750 mm to 4500 mm varying from place to place. The rainfall is spread over a period of 6 to 8 months, generally from May to November starting sometimes in April and extending upto January.

The climate of Andaman and Nicobar Islands is warm, humid and tropically wet.

2. SOCIO-ECONOMIC INDICATORS

"Aborigines" were the only inhabitants of these Islands till the year 1788. When British Government started penal settlement at these Islands, convicts were allowed to get their families also settled in these Islands. A labour force was also brought by the British Government for doing work in forests etc. After independence the Andamans were chosen by the Government of India to solve the great problem of rehabilitation of the refugees from East Pakistan etc. and the first settlement started in 1949. These Islands are like a miniature India.

The projected population as on 31.3.1981 of the Islands is 189 thousands. The corresponding population as per 1971 census was 1,15,000 and projection for 1990 is 2,75,000. The break-up of population in urban and rural areas is 26,000 and 89,000 respectively (1971 census) and 44,000 in urban and 145,000 in rural as per 1981 projection and will be 67,000 in urban and 208,000 in rural as per 1991 projection respectively.

The economy is mainly reliant on the vast forest reserves of the Islands which cover 90% area of the Islands. Agricultural crops consist of rice coconuts and arecanut. The number of working people is only 32.96 percent of the total population.

Population of the Union Territory of Andaman and Nicobar Islands is mixed and multilingual. Hindi is widely spoken and understood as the link language in the Islands.

Port Blair, the only urban area has a literacy percentage of 65.36%. The region of poor literacy is the one inhabited by the aboriginal tribes. The percentage of literate persons as per 1971 census is given in the table below:-

<u>Total</u> Percent	<u>Percentage of Literacy</u>	
	Males	Females.
51.27	54.44	41.85

3. HEALTH ASPECTS

The lack of safe water, poor sanitation, low standard of hygiene and ignorance about health and diseases are the causes for frequent outbreaks of different types of epidemic diseases especially of the gastro-intestinal tract.

The following table gives the number of patients treated in various Government Hospitals and dispensaries of the Islands since the year 1978 to 1980.

Name of Disease	1978	1979	1980
Malaria ...	6274	15762	9842
Dispepsia & Diarrhoea ...	11680	20667	18892
Dysentery ...	10247	36132	29524

4. WATER RESOURCES

No long-term data on surface water flow and ground water potential is available since no systematic studies and investigation for their assessment have been carried out. An Investigation Division of the Central

Water Commission has been functioning in the Islands from 1971 and has set up discharge observation sites on some of the streams as part of investigation of schemes for multi-purpose benefit to this Union Territory.

It was noted during field visits that ground water occurs at a shallow depth 1 - 1.5 metres below ground surface in January and goes down to about 2.50 - 3 metres below ground level during the summer months.

At present R.C.C. ring wells have been constructed where natural surface water source is not available and the population is scattered over a vast area, making provision of piped water supply uneconomical. In villages getting water supply through R.C.C. wells, the population covered is about 45,000.

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

By the end of 31.3.1981, the achievement in the Union Territory in respect of water supply is 100% in the only urban area of Port Blair and 53.1% in rural areas. In respect of sanitation it is 54.54% in the urban areas and nil in rural areas. However, some of the government quarters in rural areas have their own septic tank facilities.

6. SECTOR ORGANISATION

The Andaman P.W.D. is constructing/maintaining head works and gravity mains and distribution mains of the water supply system in Port Blair. The Municipal Board is laying the distribution lines and tap connections. The Municipal Board is taking treated water from P.W.D. on payment and collect the water charges from the house holds on flat rate basis per connection. So far as the sanitation facility is concerned, at present bucket/privy system is in force except in the Government buildings where septic tanks are provided. Now the Municipal Board is encouraging the public for providing septic tank system by given loan with 1/3 subsidy and work is included in plan scheme.

In rural areas water supply projects are being executed and maintained by the Andaman P.W.D. In some villages a few RCC Ring Wells are being provided by the Block Development Authority.

Wherever the P.W.D. have executed the piped water supply projects it is being operated and maintained by the P.W.D. itself and public have to take water from public hydrants only. No house connection is given to the private buildings.

Regarding sanitation, there is no sanitation facilities provided by the Government. The villagers are managing by providing well type latrines i.e. making deep hole (about 10 to 15 ft) in ground and constructing shed with cover or using the adjacent jungle for defecation.

7. DECADE PLAN TARGETS

The target population for coverage of urban and rural water supply by the year 1990 works out to 23,000 and 1,31,000 respectively which will constitute 100% service coverage, likewise the target population for sanitation service coverage works out to 30,000 in urban and 52,000 in rural areas which will constitute 80% and 25% of population coverage. The population coverage targets are given in the following table.

Sub-Sector	Target population for the Decade.	Population to be covered in 6th Plan i.e. during 81-82 to 1984-85	Total population that will be benefitted as on 31.3.1991 including the coverage as on 31.3.1981	
Urban Water Supply	23,000	13,500	67,000	(100%)
Rural Water Supply	1,31,000	78,000	2,08,000	(100%)
Urban Sanitation	30,000	800	54,000	(80%)
Rural Sanitation	52,000	10,000	52,000	(25%)

8. DECADE PROGRAMME FUNDING

The total amount required for implementing the Decade programme and that allocated in the Vith Plan is as follows:-

Sector	Amount required for the whole Decade	Amount available in 6th Plan excluding expenditure in 1980-81	Amount still required
(Rupees in Thousands)			
1. Urban Water Supply	12075	6941	5134
2. Rural Water Supply	58075	38314	19761
3. Urban Sanitation	13500	1000	12500
4. Rural Sanitation	2600	500	2100
Total:	86250	46755	39495

From the above it appears that the funds that are required for the remaining period of the Decade, are much less than what may be available

during the 7th Five Year Plan and first year of the 8th Five Year Plan. Besides as per the Finance Working Group recommendations set up by the Apex Committee, Government of India, the allocation of funds for this sector would be double of that of VIth Plan allocations. This would take care of even the escalation of prices.

With the Sixth Five Year Plan allocations for the sector, it is expected that water supply will be provided to an additional population of 13,500 in urban and 78,000 in rural areas respectively. Similarly, sanitation services will be provided to an additional population of 800 in urban and 10,000 in rural areas.

The priorities for the implementation of the Decade Programme in the Territory are based on Government of India's policy. A State Implementation and Coordination Committee under the chairmanship of Lt. Governor has been set up in this Union Territory for the over-view and monitoring of the implementation of the Decade programme.

The major constraint experienced in the implementation of the programme is transportation of materials from mainland to the Union Territory and among the individual Islands. Therefore, co-operation of the Marine Department is very much necessary in this regard. In order to ascertain the ground water potential in the Islands detailed G.W. explorations have to be conducted by Central Ground Water Board. This is necessary due to the fact that drought condition prevails in the 4 months of summer season in a year when there is no run-off in streams and there is non-availability of ground water also.

9. SUPPORT PROGRAMMES

The only other department whose co-ordination is required is the Marine Department which has to allow shipping space for the transportation of materials/stores to the sites of works on different Islands and also to make small boats available for going to Islands to which there is no regular or even irregular ferry service.

A State level committee for implementation and coordination of activity has been formed for this Union Territory with as the Chairman and 10 members including the M.P., the Counsellors, Secretary (PWD), Development Commissioner, etc. The policy decisions are taken by this coordinating committee.

Except for a very few number of aboriginal tribes, the local population consists of settlers only and so far Government is providing all services to meet their demands. At this stage no community participation can be expected from them. But with the passage of time, of say a generation, community participation can be thought of. However, efforts will be made through Adult Education and Health Education to popularise the use of safe drinking water supply and sanitation methods.

ANDAMAN AND NICOBAR ISLANDS

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

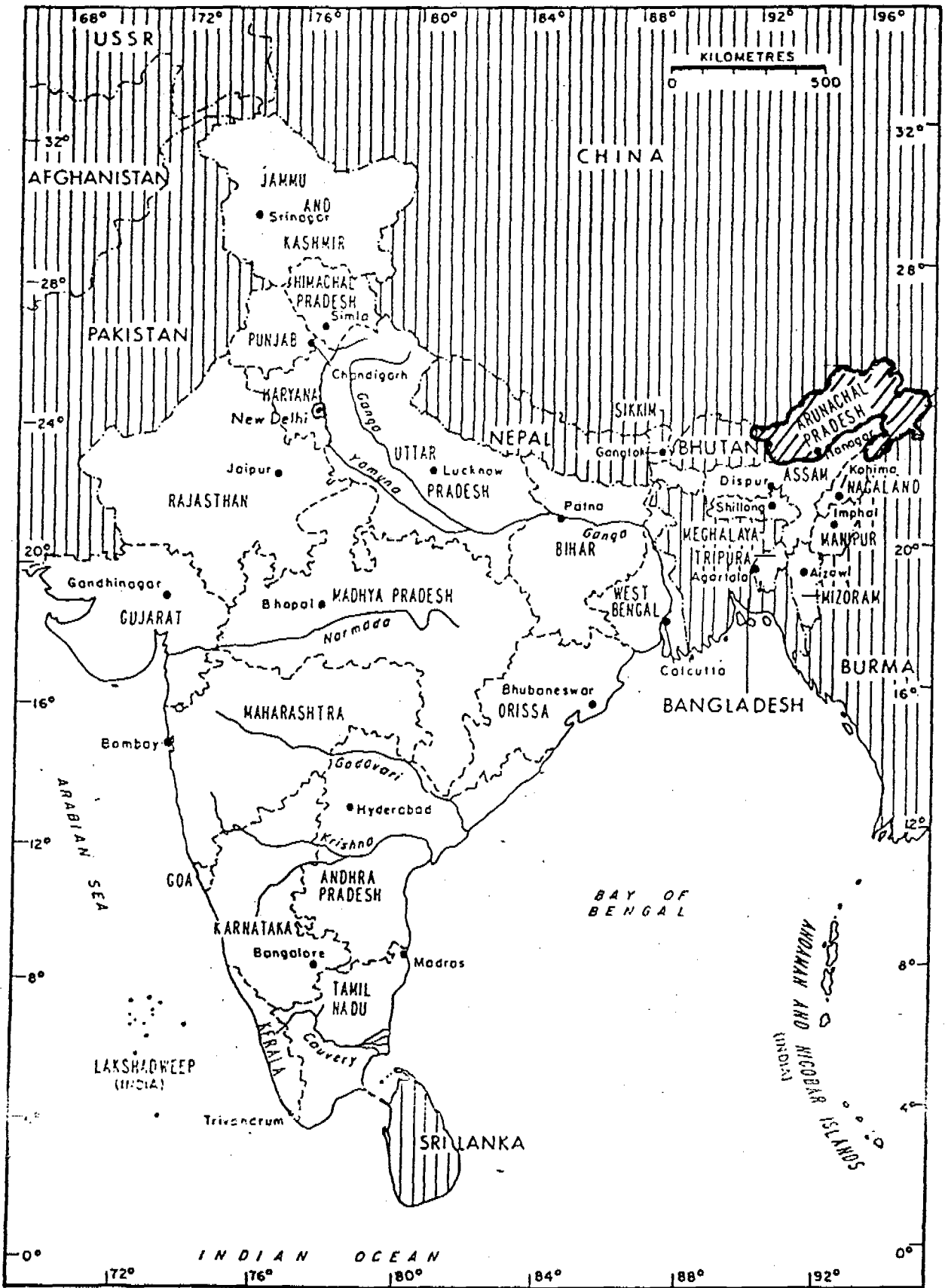
(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	3	800	13	5340
1982-83	3	1020	21	9750
1983-84	3.5	3021	23	11010
1984-85	4	2100	21	12214
1985-86	1.5	1200	9	3680
1986-87	1.5	1000	9	3680
1987-88	1.5	800	9	3680
1988-89	1.5	800	9	3680
1989-90	1.5	800	9	3680
1990-91	1.5	534	8	1361
Total	23	12075	131	58075

SANITATION

1981-82	0.20	-	0.4	-
1982-83	0.20	60	3.20	120
1983-84	0.20	270	3.20	160
1984-85	0.20	670	3.20	220
1985-86	4.8	2200	7	350
1986-87	4.8	2200	7	350
1987-88	4.8	2200	7	350
1988-89	4.8	2200	7	350
1989-90	5.0	2200	7	350
1990-91	5.0	1500	7	350
Total	30	13500	52	2600

UNION TERRITORY ARUNACHAL PRADESH



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
ARUNACHAL PRADESH

1. INTRODUCTION

The erstwhile North Eastern Frontier Agency was granted the status of Union Territory during 1972 under the provisions of North East Areas (re-Organisation) Act 1981 of 1971. The territory was named as Arunachal Pradesh. It is strategically an important territory, having the international boundaries of China and Tibet in the north, China and Burma in the East and Bhutan in the West. The Indian states viz. Assam and Nagaland are in the South of Arunachal Pradesh.

The geographical area of the territory is 83578 sq. kilometres. Most of it is having hilly and rugged topography except for a small and narrow belt along the boundary of Assam state in the foot-hills. It is inhabited by tribal population except for Govt. employees and workers coming from other parts of the country. The entire territory has been divided into nine districts.

About 62% area of the territory is under forests. The main occupation of the tribal people are agriculture, animal rearing and forest based small scale industries.

The altitude of the land near the plains of Assam is less than 300 metres with warm and humid climate upto 600 metres height from MSL. In the sub-mountainous region, the climate is moderate upto 1500 metres. Above this, the climate is dry and cold. The complexity of relief, has a profound effect on the distribution pattern of rainfall. The average annual rainfall is about 250 cm.

2. SOCIO-ECONOMIC INDICATORS

There are 110 tribes and subtribes, each having different entity, distinctly visible from their costumes, housing pattern, living conditions, cultural habits and the dialect. The people are poor and backward. The population of the territory as per 1971 census was 466,000 and the actual population from 1981 census records is 628,000. However, projected

1981 population is 635,000 and that of 1991 is 829,000 i.e. 34.34%. The growth rate of urban population is conspicuously high about 64.7%, obviously because, with the development of the area, the local educated people are becoming urbanised and the business prospects are alluring the entrepreneurs and traders from outside also are attracted to concentrate and promote their business interest in the district headquarters and the territory capital at Itanagar, which is still in the construction stage. The rural population is 95.6% of the total population of the territory, mostly concentrated in the river valleys and the foot-hill areas having better scope for improved agricultural practices. The density of population is 7 persons per square kilometer.

The territory is educationally backwards having literacy rate of 20.09% as per 1981 census. There are only two degree colleges and 14 higher secondary schools. An Industrial Training Institute at Roing is imparting training in different trades with preference to the local drop outs of the secondary schools. There is overall shortage of technical and skilled personnels.

3. HEALTH ASPECTS

The average life expectancy as per information furnished by the Director of Health Services is 60-70 years.

The people have got less inclination towards cleanliness and generally suffer from malnutrition. They eat meat, fish, and other food stuffs often stored for a long time and exposed to natural conditions which spreads diseases. The following diseases leading to death are common.

S1. No.	Name of the diseases	During the last 5 years (Approx.)
1.	Diarrhoea/Dysentery	2,50,000 patients
2.	Stomach and Intestinal diseases	1,50,000 "

Epedemic Diseases

The common ones are Malaria, Diarrhoea/Dysentery, TB, skin diseases, Malaria is common in lower altitudes and the foothill belt of the territory. The other diseases are common almost all over the territory. Goitour was prevalent in Raga Circle of lower Subansiri district earlier. With the distribution of iodized salt, after inception of Administration, such cases are no more seen among the younger generation.

Other Health Hazards

Unhygienic conditions, food commodities exposed to flies and other germs, less inclination toward washing and bathing, living with animals like pigs, dogs, poultry birds in the same house, spread various diseases. There is no industrial population but poor sanitation and stagnation of rainwater in some of the villages, do cause environmental contamination.

4. WATER RESOURCES

For estimation of available surface water resources, the well equipped hydre meterological stations do not exist in the territory at present, as a result the water balance and stream flow data could not be worked out. The Central Water Commission has recently started investigation on few major hydel projects, which are likely to continue for a few years to obtain the reliable data. The Central Ground Water Board had also taken up the task of survey and estimation of ground water potentials but the report is still not available.

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

Upto the fourth Plan period, 688 villages were covered with some kind of water supply, making use of polythene pipes. There existed no engineering department exclusively for implementing such schemes at that time, therefore, the materials were issued to the villagers directly for lifting upto the site and laying these materials with little know-how that they possessed.

The Rural Works Department was created during 1978 to implement such schemes in rural areas and during fifth plan period. 545 villages and 48 townships were provided with drinking water. In the first year of the Sixth Plan (1980-81) another 172 villages and 9 townships were covered. Thus prior the launching of this Decade, total 1405 villages and 57 townships had already been covered with drinking water supply. The population served as on 31.3.1981 was 417,000 with drinking water supply) 25,000 urban and 392,000 rural) and 22000 under urban sanitation.

6. SECTOR ORGANISATION

It was earlier a centrally administered area under the Ministry of Home Affairs. During 1972, it was made Union Territory. Subsequently, the programmes and schemes under different sectors are executed by different departments. Two engineering organisations viz - PWD and RWD are in existence with clear demarcation of the responsibilities. The water supply and sanitation works in urban areas (Admm. centres) are executed by the PWD and in rural areas by the Rural Works Department. The Rural Works Department is responsible for Minor Irrigation, Soil Conservation

Rural Roads and bridges, fisheries works and agricultural machineries, in addition to the rural water supply and sanitation schemes. The Public Works Department has a Chief Engineer, five Superintending Engineers.

The plan programme are executed by various departments with functionaries spread over the entire U.T. right upto the village level. The Concerned head of the department is responsible for survey, planning and execution of the projects and is answerable to the Secretary of the Department, The Survey, investigation, execution, operation and maintenance works are done by the Executive Engineer through his supporting staff in both the department viz. PWD, RWD. The planning & design cells are attached to Chief Engineer's Office. The technical sanctions are accorded at each level within their technical powers, which are concurrent to those of the CPWD Officers. The Chief Engineer has full powers.

The Rural Works Department is responsible for execution of rural water supply and sanitation schemes while Public Works Department is responsible for urban water supply and sanitation programmes throughout the Union Territory.

7. DECADE PLAN AND TARGETS

Most of the problem villages and urban areas can be covered with drinking water supply during the Sixth Plan except 55 villages. In addition to this, another 29' non-problem villages would be left uncovered. These 340 villages are proposed to be covered with drinking water supply during the first two years of the Seventh Five Year Plan. The Seventh Five Year Plan period and the first year of the Eighth Five Year Plan, will also be devoted to augmentation of water supply schemes and a few urban systems which were constructed before the Fifth Plan period. Filtration and treatment in 760 villages and the remaining township will also be provided within the Decade period. By population, 412,000 will be provided with drinking water supply both in urban and rural areas (18000 + 394000) and 209,000 (12,000 + 197,000) will be covered with sanitation facilities during the Decade period.

8. DECADE PROGRAMME FUNDING

The total investment cost, as per the Decade Master Plan would be Rs. 174225 thousands for these programmes. The plan-wise phasing for the period coinciding with the Decade as as under:-

6th Plan (1981-82 to 1984-85)	-	Rs.140,851 thousands
7th Plan (1985-86 to 1989-90)	-	Rs.154,740 thousands
8th Plan (1st year 1990-91)	-	Rs. 32,000 thousands
Total:		<u>Rs.377,211 thousands</u>

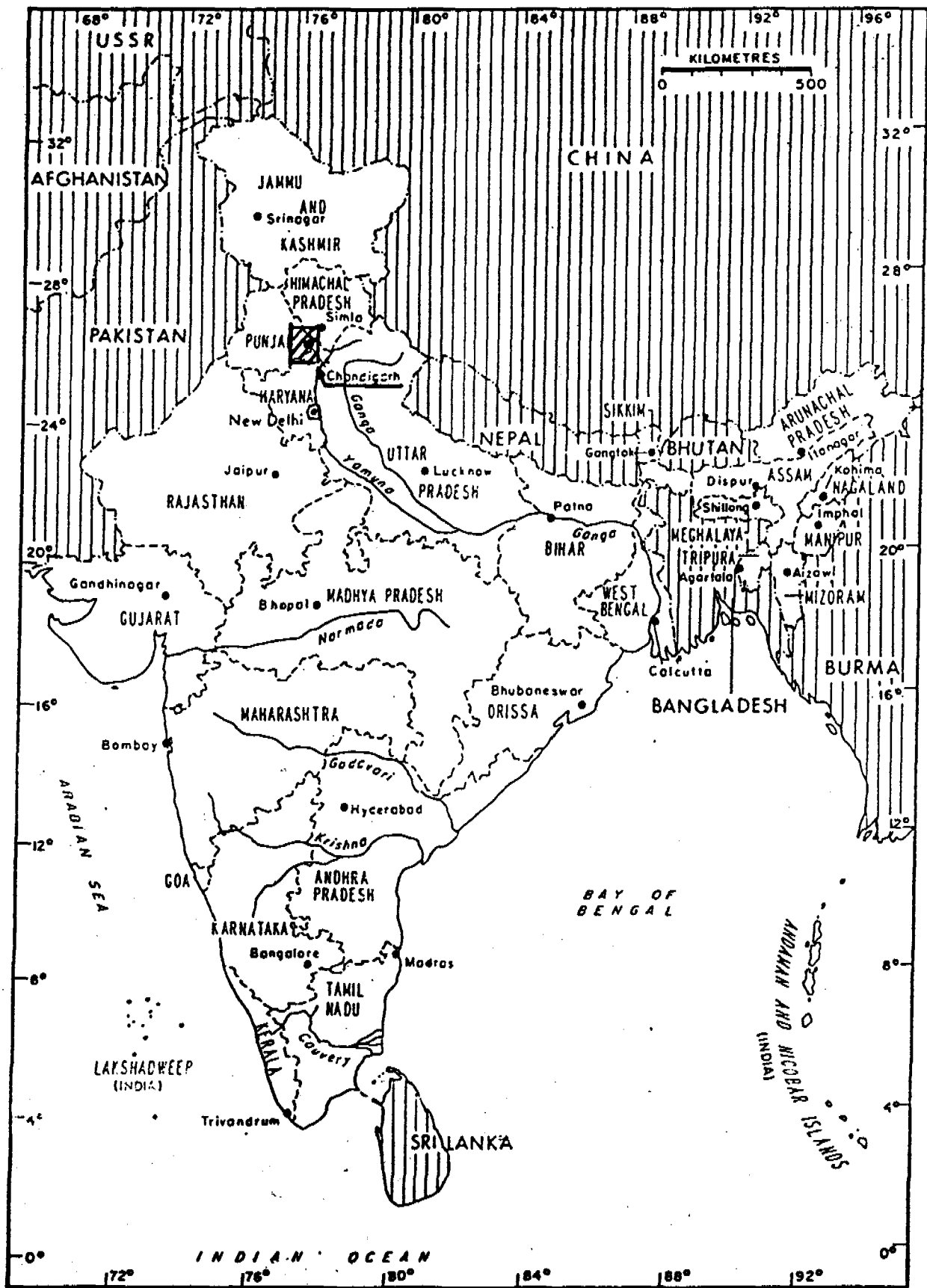
Under state sector, grant of Rs. 1277.00 lakhs which is only about 6.02% of the total annual plan size of the territory, has been allocated during the Sixth plan. Another Rs. 247.50 lakhs were allocated under Central sector grant. Thus total allocations during Sixth Plan comes to Rs. 1524.50 lakhs. The Government of India, has been approached to enhance it, so that full targets envisaged for Sixth Plan period of the Decade could be achieved. Out of this Sixth Plan grant, Rs. 115.99 lakhs were spent during 1980-81 prior to launching this Decade, and therefore, only Rs. 1408.51 lakhs are available for the Decade period in the Sixth Plan.

The main source of funds is the allocations made by the Government of India. No other lending agencies and external assistance has been sought for, as the rural water supply schemes are of small size. The territory is inhabited by backward tribal people and no water charges are levied on them. Therefore repayment of loan if taken from outside would be difficult from these non-emunerative schemes. The water supply schemes are taken with the consent of the Zilla Parishad at different level and approval of State Planning Board, chaired by the Chief Minister. The priorities within the available resources, are also fixed by the State Planning Board. The expenditure sanction is accorded by the Administrator, and the sanctioned projects are executed by Public Works Department in urban areas and Rural Works Department in rural areas.

Funds required for the Decade Programme (1980 price level)

i) Urban Water Supply	-	Rs. 9000,000
ii) Rural Water Supply	-	Rs.150175,000
iii) Urban Sanitation	-	Rs. 5200,000
iv) Rural Sanitation	-	Rs. 9850,000
		<hr/>
TOTAL:		Rs.174225,000
		<hr/>

UNION TERRITORY OF CHANDIGARH



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
CHANDIGARH

1. INTRODUCTION

The Chandigarh, Union Territory, covers an area of about 114 sq. km. It consist of 46 sectors, 1 to 12, 14 to 47 and an Industrial Area. The area of city is 57.60 sq.km. In addition to this, there are 22 villages which fall under the U.T. of Chandigarh out of which 4 villages come under the master plan and the remaining 18 villages fall under the rural area. The area of these villages is 56.40 sq. km. Development of the city under master plan is divided into 2 phases. First phase consists of 29 sectors (1 to 12) and 14 - 30, and about 500 acre of Industrial Area. The remaining area of master plan fall in the second phase of development.

Chandigarh is situated in the foot of Shivalik Hills and bounded by Punjab and Haryana States on the Ambala-Kalka Railway Line.

Boundaries:

East: Ambala (Haryana)
West: Ropar (Punjab)
South: Patiala (Punjab)
North: Ropar (Panjab)

2. SOCIO ECONOMIC

The projected population of the city on 31.3.1981 was 5.17 lacs and the rate of growth is 8.6% per year. It is estimated that the population of Chandigarh by 31.3.1991 will be 9.52 lacs.

The climatic conditions in Chandigarh are hot in Summer, temperature going up to 11°F and cold in Winter, temperature dropping at times to below freezing point. The season here has been divided, during the year as below:

- | | | |
|----|------------------------|--|
| a) | Summer season | : From April to mid-July, these are dry and hot months |
| b) | Monsoon | : From mid-July to mid-September |
| c) | Winter & Spring season | : From mid-September to March. |

Chandigarh area experiences annual average rain fall of about 42" (1050 mm). The rain is mostly confined to the months of July and August. A small part of it occurs in the Winter months of December and January.

- a) Income per capita Rs.1990/- per year as on 31.3.1981.
The trend is on up ward side.
- b) Occupation
The workers have their distribution in four broad occupation categories:
 - i) Cultivators
 - ii) Agricultural Labour
 - iii) House hold industry;
 - iv) Other workers.

3. HEALTH ASPECTS

- a) Life expectancy : 60 years (average)
- b) Morbidity and Mortality : Infant mortality
65.8/1000
Birth rate 27.1/1000
Death rate 8.1/1000

There were no water and fecal borne diseases during the past five years.

4. WATER RESOURCES

It has ascertained by the Geological Survey of India that the safe yielding capacity of underground reservoir is only 20,000 cubic meter per day (about 5 mgd) and any other drawal from the under ground reservoir is likely to have deleterious effects on the water table condition and that Administration should think of tapping alternative sources for water supply to meet the increasing demand of the City Chandigarh.

For this reasons surface water is the only source that can be used for the augmentation of water supply of this city.

5. PRESENT STATUS OF WATER SUPPLY AND SEWERAGE

Urban Water Supply and Sewerage

- a) Coverage: The total coverage as on 31.3.81, is 93.7% and by the end of decade i.e. on 31.3.1991 the coverage will be 100% (both water supply and sewerage).

- b) Information of service level of water supply: The service level as on 31.3.81 is 60 gallons per head per day. It will be 100 gallons per head per day on completion of the Augmentation of water supply scheme based on surface water.

Adequate attention is being paid during the planning and designing of the water supply system to facilitate good operation and maintenance, access roads, measuring devices and communication facilities have been provided.

The head of the operation is one Executive Engineer, with qualified and experienced staff working under him for proper maintenance.

As regards funds, the Water Supply Project at Chandigarh is being run on no profit no loss basis and in case of any loss the water rates are revised accordingly.

6. SECTOR ORGANISATION

The water supply and sanitation of the Union Territory of Chandigarh is being looked after by the Public Health Wing of the Engineering Department under the Chief Engineer and Secretary, Engineering Department. The organisation set up at present is as under:

1.	Chief Engineer & Secretary Engineering Department (Common to all Engineering-set up)	1 No.
2.	Superintending Engineer, Public Health	1 No.
3.	Executive Engineers	5 Nos.
4.	Sub Divisional Engineers	17 Nos.

The maintenance of the water supply and sanitation (sewerage) is also looked after by the Public Health Department.

Functional Responsibilities

The functional responsibilities of water supply and sanitation both rural and urban for all the different aspects like investigation, survey, design, execution, operation and maintenance, quality control, lies with the Engineering Department. As regards legislation powers of sanction (adm. financial and technical) is as under:

The yearly budget of the expenditure of Union Territory is passed by Parliament.

The Administrative approval upto 5 lacs is accorded by the Chief Engineer, Engineering Department as regards technical sanction full powers (against which funds are available).

Administrative approval of estimates more than five lacs and upto 25 lacs the administrative approval is being accorded by the Finance Secretary (if the budget provision exist), Union Territory, Chandigarh, Beyond this all the administrative approvals are accorded by Finance Department of Centre Government.

7. DECADE PLAN TARGETS

The overall picture of the achievement in water supply and sanitation in urban area till the March 1981 is that 93.7% of the urban population have been provided with water supply sanitation facilities.

The target population assessed for provision of water supply/sanitation facilities by end of March 1991 is about 4.72 lacs. In addition the programme envisages for augmentation of service to about 4.80 lacs population in respect of urban water supply and sanitation.

Target population and coverage

Target population is the uncovered population as on 31.3.81 plus the increases in population during 1-4-81 to 31.3.1991.

Urban water supply (in thousands)	: 472
Urban sanitation -do-	: 472

(Note: In addition to above a population 480 (thousands) needs augmentation facilities (both water supply & sanitation).

Plan Outlay

<u>Investment Cost</u>	<u>Cost in thousands</u>
a) Urban Water Supply	Rs.378 400.-
b) Urban Sanitation	Rs.237 080.-
Total	<u>Rs.615,480</u>

8. DECADE PROGRAMME FUNDING

The total funds required for the achievement of decade targets are estimated to be Rs.61.55 crores based on the figures at 1980 prices to cover the target population as of March, 1991 i.e. 4.72 lacs persons (both water supply and sewerage).

Sectorwise break up is as under:

Urban Water Supply	37.84 crores
Urban Sanitation	23.71 crores
Total	<u>61.55 crores</u>

Total out-lay provision of 6th Five Year Plan (1980-85) of U.T., Chandigarh is 100.75 crores out of which funds provided for the urban water supply and urban sanitation is 15.66 crores which come to 16% of the total outlay.

The break up of tentative allocation of Rs.15.66 crores in the 6th five years plan is given as under:

Urban Water Supply	11.96 crores
Urban Sanitation	3.70 crores
Total	<u>15.66 crores</u>

Out of Rs.15.66 crores an expenditure of Rs.3.44 crores has already been incurred in the year 1980-81 which does not come under the decade plan. Therefore, the amount available in the sixth plan Rs.(15.66-3.44) = Rs.12.22 crores. Thus the funds required for remaining period of decade is (61.55 - 12.22) = Rs.49.33 crores. The total funds required for the 7th five year plan and 1st year of 8th plan i.e. upto 31.3.1991 is Rs.49.33 crores.

Chandigarh

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

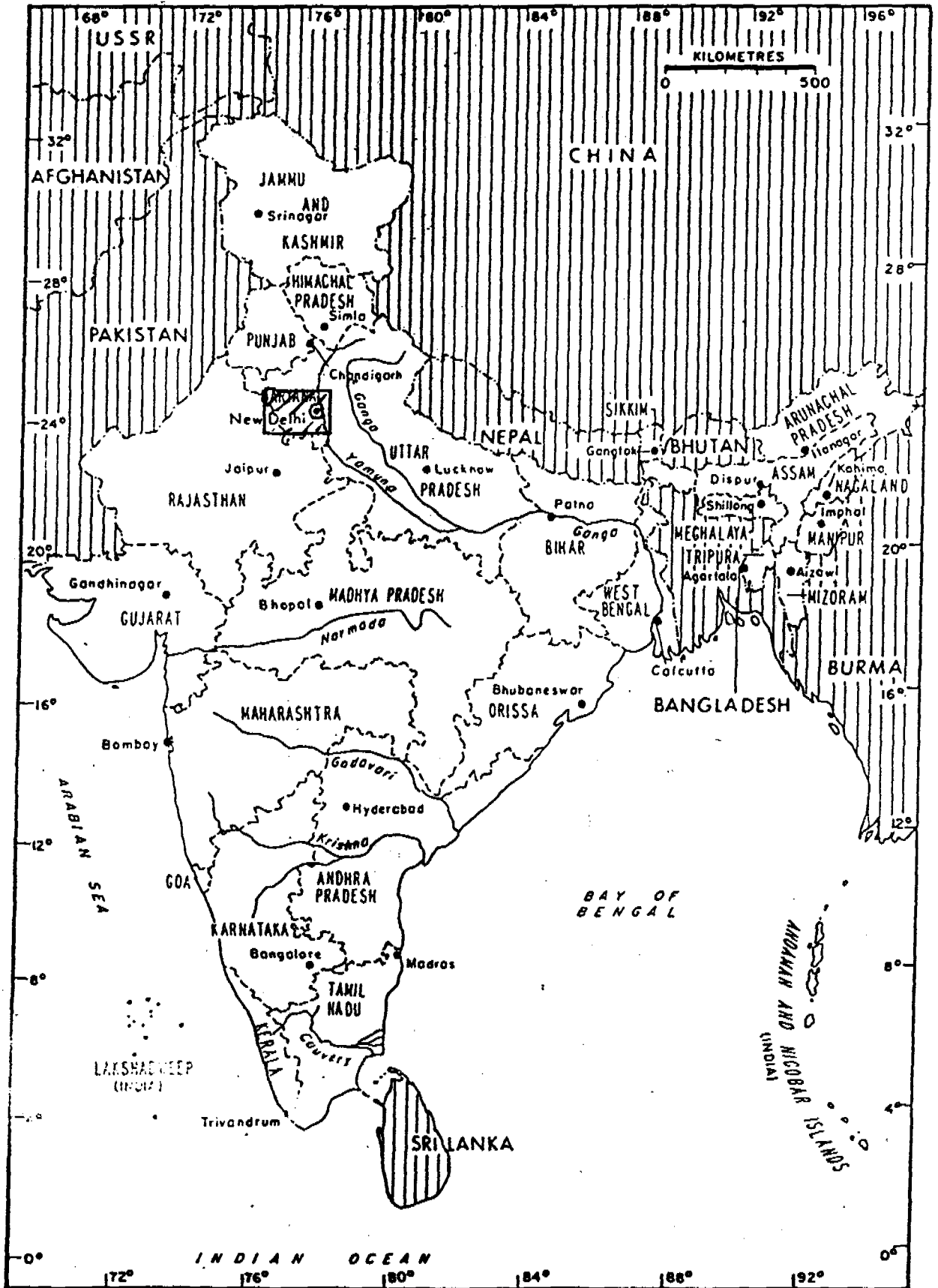
(Population and cost Rs. in thousand)

Year	Urban		Rural			
	Population to be covered	Capital cost to be utilised	Population to be covered		Capital cost to be utilised	
			RWS	RWC	RMS	RWC
1	2	3	4		5	
1981-82	25	36 700				
1982-83	25	45 300				
1983-84	25	5 600				
1984-85	25	5 000				
1985-86	50	40 650				
1986-87	60	41 260				
1987-88	60	51 160				
1988-89	75	52 175				
1989-90	75	52 175				
1990-91	52	48 380				
Total	472	378 400				

SANITATION

1981-82	25	5 600		
1982-83	25	5 533		
1983-84	25	9 150		
1984-85	25	8 467		
1985-86	50	30 425		
1986-87	60	31 710		
1987-88	60	31 710		
1988-89	75	33 640		
1989-90	75	42 440		
1990-91	52	38 405		
Total	472	237 080		

UNION TERRITORY OF DELHI



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
DELHI

1. INTRODUCTION

The Union Territory of Delhi having an area of 1,485 sq.km. is one of the smallest States of India as the area of Union Territory forms only 0.05% of the total area of India. Delhi has 1038.7 sq.km. of rural area. The present district of Delhi was first constituted in the year 1819.

It is bounded on the North West and South by Haryana and on the East by Uttar Pradesh. River Yamuna flows by the side of its Eastern border in a North South direction, cutting Shadra area from the main tract.

Delhi has extremes of climate with dry and intensely hot summers starting from the middle of March to June and a very cold winter starting from December to the middle of February with rainy season in between. The average rainfall is 662 mm.

The area of Delhi is generally plain with rocky ridge in the centre extending from near Wazirabad barrage on river Yamuna, on N.N.E. of Delhi to S.S.W. of Delhi.

Physically it can be divided into 3 parts viz.

- i) Hard rocky area or ridge
- ii) Alluvial plains either side sloping from ridge.
- iii) The alluvial plain of the trans-Yamuna area Shadara.

The altitude of Delhi ranges from 213 metre to 305 metre above mean sea level.

Monsoonal winds bring rain to Delhi. There are two such monsoon currents flowing over the area. They are the South-West monsoon and North-East monsoon currents. The South-West monsoons current is more active than the North-East one. It brings moderate to heavy rains over Delhi during the period from late June to beginning of September.

2. SOCIO-ECONOMIC INDICATORS

The population of Union Territory of Delhi was 4 051 000 according to 1971 census as per following break-up:

<u>Urban</u>		
i)	M.C.D.	3 287 883
ii)	N.D.M.C.	301 801
iii)	Delhi Cantt.	57 339
	<u>Total Urban</u>	<u>3 633 000</u>
		3 633 000
<u>Rural</u>		
i)	Delhi Tehsil	228 071
ii)	Mehrauli	190 604
	<u>Total Rural</u>	<u>418 000</u>
		418 000
	<u>Total Gross</u>	<u>4 051 000</u>

The per capita income of Union Territory of Delhi for the year 1970-71 was Rs.1186 which gradually increased to Rs.2445 during 1978-79.

3. HEALTH ASPECTS

The Health Programme in Delhi is essentially aimed for the eradication of diseases like smallpox, cholera, malaria and other water-borne diseases. The life expectancy has now been increased as compared to the past. The death rate has been decreased from 9.0 per 1000 population in 1951 to 6.9 per 1000 population in 1978. The infant mortality rate per 1000 live births has decreased from 84 in 1951 to 47.7 in 1978.

The water borne diseases are mostly in the areas where no proper water treatment facilities are available and the people use the untreated and polluted water. The following table indicates the death on account of cholera, smallpox, fever, dysentery and diarrhoea during the 5 years from year 1974 to 1978.

Description of disease	1974	1975	1976	1977	1978
Cholera	22	5	1	2	2
Small pox	31	-	-	-	-
Fever	2 077	2 532	2 317	2 443	2 044
Dysentery & Diarrhoea	616	1 727	1 098	983	798

4. WATER RESOURCES

Ground Water: The Union Territory of Delhi, Geo-hydrologically seems to have a limited ground water. First of all there is paucity of good aquifer within known depth of alluvium and secondly there is widespread chemical quality problems, both laterally and vertically. Tubewells and Ranney wells are the two sources of ground water. Tubewells have been constructed in the rural as well as in urban areas where potable ground water is available. There are 172 tubewells in the urban areas and 60 tubewells in the rural areas. The Ranney wells are radial collectors wells for tapping the ground water source. Ranney wells have been constructed in the riverine area of Yamuna along left marginal embankment after carrying detailed survey and investigation and trial bores upto a depth of 30 metres. 8 Nos. Ranney wells each of 2.5 mgd. capacity were constructed earlier and additional 6 Nos. are under construction between old railway bridge and barrage near C-Power Station. Further investigation is being carried out for additional sites and it is proposed to construct 8 Nos. more Ranney wells during the period upto 1981-85 and requisite provision of funds has been made in the Sixth Five Year Plan.

Surface Water: The Union Territory of Delhi is situated on the bank of River Yamuna which flows through the city from North to South. The river Yamuna originates from Yamunotri Glacier of Himalayas in Garhwal Distt. of Uttar Pradesh. Many small hill streams of Uttar Pradesh and River streams of Himachal Pradesh joins the river before it reaches Tajewala Head Works. At Tajewala Head Works, two major Canals viz. Eastern Yamuna Canal in Uttar Pradesh and Western Yamuna Canal in Haryana, take-off. Both the Canals terminate in the Union Territory of Delhi. Tajewala Head Works is controlled by the Irrigation Department, Haryana.

The Yamuna River is an inter-state river and its basin covers larger areas in the State of Haryana, Uttar Pradesh, Rajasthan, Union Territory of Delhi and small area of Himachal Pradesh. The Yamuna waters upto the Tajewala are at present being used extensively by Haryana and Uttar Pradesh for Irrigation as per agreement reached in 1954 between erstwhile Punjab and Uttar Pradesh. The Yamuna water below Tajewala and upto Okhla area is also being used by the Uttar Pradesh and Haryana for irrigation. The Union Territory of Delhi and Rajasthan also use Yamuna water for irrigation and drinking water supply. So far as there has been no comprehensive agreement regarding the sharing of Yamuna water amongst all the basin states. Delhi has been drawing water for drinking from the flow in River Yamuna as its riparian right and this water is the only main source of raw water for the existing 90 MGD water treatment plant at Chandrawal and 80 mgd. at Wazirbad 100 mgd. Treatment Plant set up at Haiderpur receives 200 cusecs of water from Western Yamuna canal system in addition to the supplies to be released for the existing plant mentioned above.

under an agreement with the Uttar Pradesh Government 0.145 MAF (200 Cusecs of water) of water will be made available from Ram Ganga Canal system to Delhi for 100 mgd. water Treatment Plant being set up by the Undertaking at Shahdara.

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

The population of Delhi as on March 31, 1981 was 6184 thousands comprising of 5684 thousands in the urban areas inclusive of N.D.M.C. and Cantt. areas and 500 thousands in the rural areas, Delhi draws its water requirement from river Yamuna at Wazirabad Barrage and Okhla and also from Western Yamuna Canal and the Ranney wells. The total production of water from various sources till date is as follows:

1.	Chandrawala & Wazirabad	(170 MGD)	774 MLD
2.	Okhla	(6 MGD)	27 MLD
3.	Ranney wells & tubewells	(27 MGD)	123 MLD
4.	Haiderpur	(100 MGD)	455 MLD
	Total	<u>(303 MGD)</u>	<u>(1379 MLD)</u>

Total urban population covered upto 31.3.81 is 4700,000.

As regards the rural areas there are 245 villages in all in the rural areas of Delhi and out of these 138 villages have been provided with potable water supply upto March, 1981. The total rural population covered is 284 thousands. Rural population constitutes about 8.09% of the total population of the Union Territory of Delhi.

The total population covered with sewerage system as on 1/4/81 was 3695 thousands.

6. SECTOR ORGANISATION

Besides the Metropolitan Council, there is an Executive Council consisting of four members, one of whom is designated as the Chief Executive Councillor. The members of the Executive Council have to assist and advise the administrator.

The New Delhi Municipal Committee is governed by the Punjab Municipal Act, 1911. It has a separate municipal body consisting of 11 members, all nominated. It consists of the President and four other official members and six non-official members. Power of nominations vests in the Lt. Governor of Delhi. He can also give directions to the Committee. The financial allocations for the Committee are made by the Metropolitan Council. The Committee has to incur large expenditure to maintain a higher standard of services as its population is comprised of Central Govt. employees, foreign diplomats and their staff, civil servants and ministers.

The administration of the Cantonment area is entrusted to the Delhi Cantonment Board, the functions of which are identical with other similar Boards in the country. It consists of seven nominated members and another seven elected members, headed by the Officer Commanding Station, its functions under the Ministry of Defence. It is charged with the responsibility of maintenance of civic administration within the jurisdiction.

The Lt. Governor is overall incharge of the Civil Administration. The Chief Secretary, Finance Commissioner and the Director of Vigilance, Public relation, co-ordination, Executive Council are the Chief Executive deeds working under him.

The J.W. & S. Board was abolished on the formation of the Corporation and its functions were entrusted to a newly created statutory body, called the 'Delhi Water Supply and Sewage Disposal Undertaking' under the Municipal Corporation and the entire system of water supply right from source to the consumers point, and sewage collection and disposal within the limits of Delhi Municipal Corporation were brought under its control.

7. DECADE PLAN TARGETS (POPULATION COVERAGE)

The target for the Urban & Rural Water Supply and Urban and Rural Sanitation during the decade for the Union Territory are the same as national target fixed in the country. However, under Urban Sanitation in Delhi, it is proposed to cover 80% of population with the sewerage system (SS) and 20% with conversion of bucket latrines into septic tank systems. The Rural Sanitation coverage proposed is 25% which is in accordance with the country's targets.

The population proposed to cover year-wise during the decade is as under (Tentative):

<u>Year</u>	<u>Population proposed to be covered (in thousand)</u>			
	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
1981-82	200	186	200	-
1982-83	600	80	400	
1983-84	600	-	400	
1984-85	200	-	300	
1985-86	400	-	600	25
1986-87	400	-	600	25
1987-88	400	-	600	28
1988-89	400	-	600	18
1989-90	400	-	600	20
1990-91	273	-	578	22
Total	3873	266	4878	138

8. DECADE PROGRAMME FUNDING

The investment costs for the decade plan for the targetted coverage with proposed service level and stated unit cost in respect of both Urban and Rural Water Supply and Sanitation shall be as under:

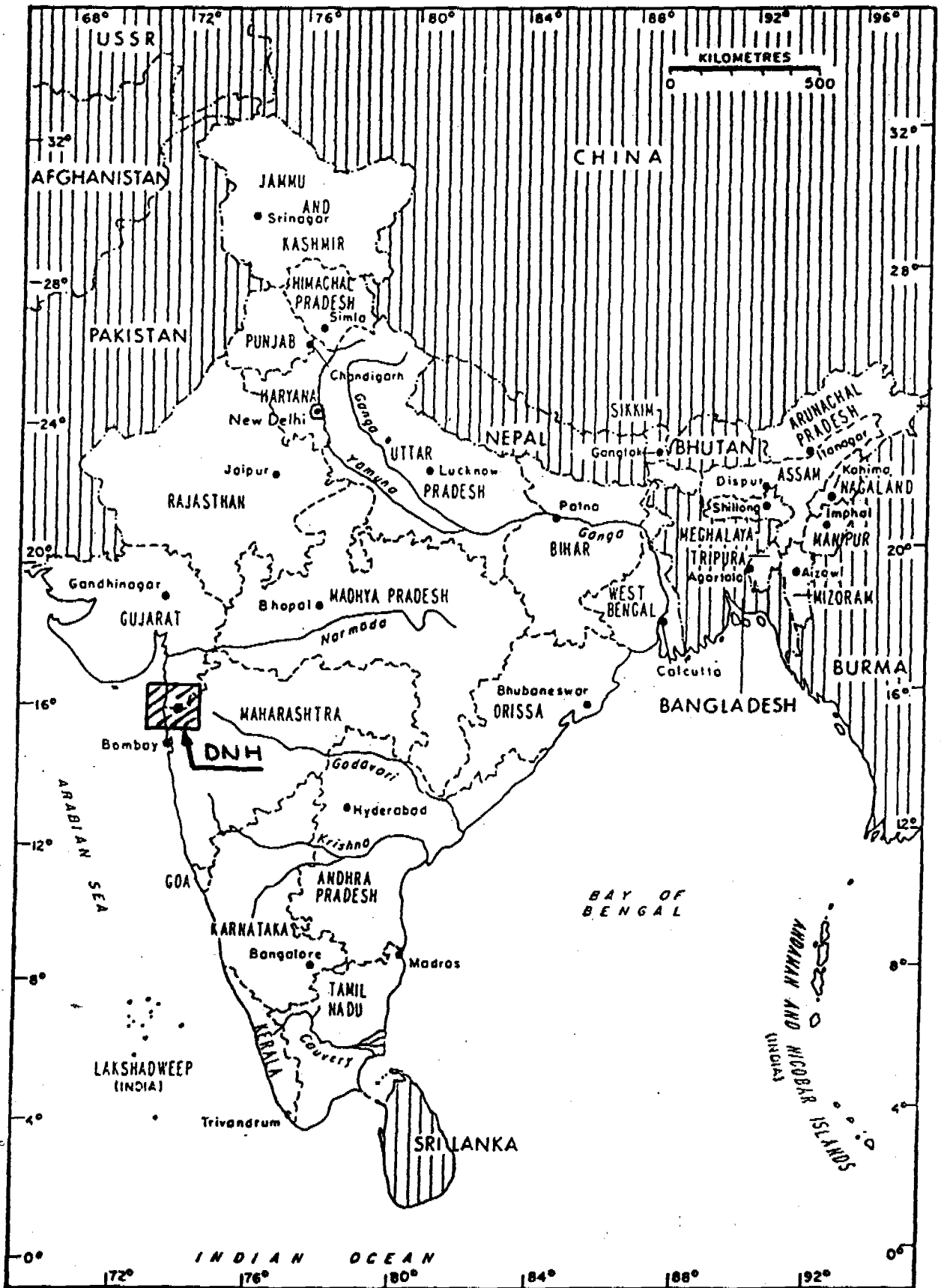
a) Urban Water Supply	Rs. 11,47,995 thousands
b) Rural Water Supply	Rs. 47,880 thousands
c) Urban Sanitation	Rs. 16,24,320 thousands
d) Rural Sanitation	Rs. 6,900 thousands
	<u>Rs. 28,27,095 thousands</u>

The total requirement of funds during the decade plan is Rs.28,27,095 thousands out of which Rs.988,400 thousands has been allocated during the four year period 1981-85 of Sixth Five Year Plan. The balance amount of Rs.1,838,695 thousands, therefore shall be required during the remaining period of decade 1985-90. In order to meet the decade target, allocation of Rs.1,838,695 thousands shall have to be made by the Central Government during the period 1985-90.

The year-wise phasing of the plan provisions (Tentative) under Urban and Rural Water Supply and Sanitation to achieve the decade targets is as under:

Year	Urban Water Supply (Amount in thousands)	Rural Water Supply (Amount in thousands)	Urban Sanitation (Amount in thousands)	Rural Sanitation (Amount in thousands)
1981-82	116 100	29 500	99 400	-
1982-83	73 400	25 500	180 000	-
1983-84	73 000	-	180 000	-
1984-85	34 000	-	173 500	-
1985-86	150 000	-	172 000	1 250
1986-87	150 000	-	172 000	1 250
1987-88	150 000	-	172 000	1 400
1988-89	150 000	-	172 000	900
1989-90	150 000	-	172 000	1 000
1990-91	101 495	-	131 420	1 100
Total	1 147 995	55 000	1 624 320	6 900

UNION TERRITORY OF DADRA & NAGAR HAVELI



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR

DADRA AND NAGAR HAVELI

1. INTRODUCTION

Before liberation of this Territory i.e., during Portuguese regime upto 1954 the conditions on the developmental front were rather stagnant. Practically no water supply facilities were existing except natural sources like rivers, ponds etc. and some open wells. No towns were provided with the sewerage system.

The Union Territory of Dadra and Nagar Haveli is situated between the State of Gujarat and Maharashtra covering an area of 491.00 sq. kms.

The Union Territory of Dadra and Nagar Haveli is completely Rural. According to the estimates based on the available data as on 31.3.1981, in the Union Territory of Dadra and Nagar Haveli 40,000 rural population were provided with safe water supply. While in case of rural population, the coverage under safe sewage disposal is almost Nil.

2. SOCIO-ECONOMIC INDICATORS

The total population of 0.74 lacs (1971 census) has increased to 0.88 lacs as recorded in the 1981 census (0.885 lacs according to 1981 projection). The territory has 72 villages comprising of 516 hamlets. The population as per 1991 projection will be 1.042 lacs. The entire population is tribal.

3. WATER RESOURCES

The Central Ground Water Board, Nagpur and National Geophysical Research Institute, Hyderabad have carried out investigations for ground water from 1976-1980 and recommended open wells and borewells in this territory.

Private geologists have also conducted investigation and recommended openwells and borewells. Services of private geologist is being utilised as and when required.

There are three main rivers in this Union Territory which supply water for irrigation purposes. Many lift irrigation schemes are in operation

(Out of 516 hamlets of 72 revenue villages, 77 hamlets of 36 villages (partly) have been identified as "Problem Hamlets" out of which 9 hamlets will be going under submergence of Damanganga Reservoir Project. As such total number of source hamlets will be 68. Remaining hamlets are having water supply facilities.)

4. PRESENT STATUS OF WATER SUPPLY SANITATION

As on 31.3.81, 40 thousand people in the rural areas have been provided with water supply facilities, i.e. about 45% of the rural population have been provided with water supply facilities.

As far as rural sanitation is concerned none of the villages have been provided with this facility.

5. SECTOR ORGANISATION

There is no separate set up of Public Health Engineering Division in this territory. The Deputy Engineer and Executive Engineer (Building) is the sole authority for planning, design, execution and maintenance of all rural water supply projects. The major water supply projects are entrusted to the Public Health Department of Government of Gujarat as deposit works.

The broad policy regarding coverage, service level and priority etc. are formulated by Executive Engineer/Accounts Officer/Administration and are finalised after discussion with Planning Commission and CPHEEO, Government of India.

For all water supply and sanitation programmes the responsibilities rest with the Public Works Department which looks after the whole territory.

6. DECADE PLAN TARGETS (POPULATION COVERAGE)

Target proposals for the Decade are as follows:

- i) 0.64 lacs of rural population will be covered under water supply at a cost of Rs. 66.42 lacs.
- ii) A rural population of 0.26 lacs is to be covered under rural sanitation programme at a cost of Rs. 13.02 lacs.

7. DECADE PROGRAMME FUNDING

Total Decade outlay works out to Rs.79.445 lacs. An amount of Rs.70.00 lacs is available in the VI five year plan. The remaining amount will be met from the 7th plan and first year of the 8th plan funds.

International Drinking Water Supply and Sanitation Decade 1981-90.

WATER SUPPLY

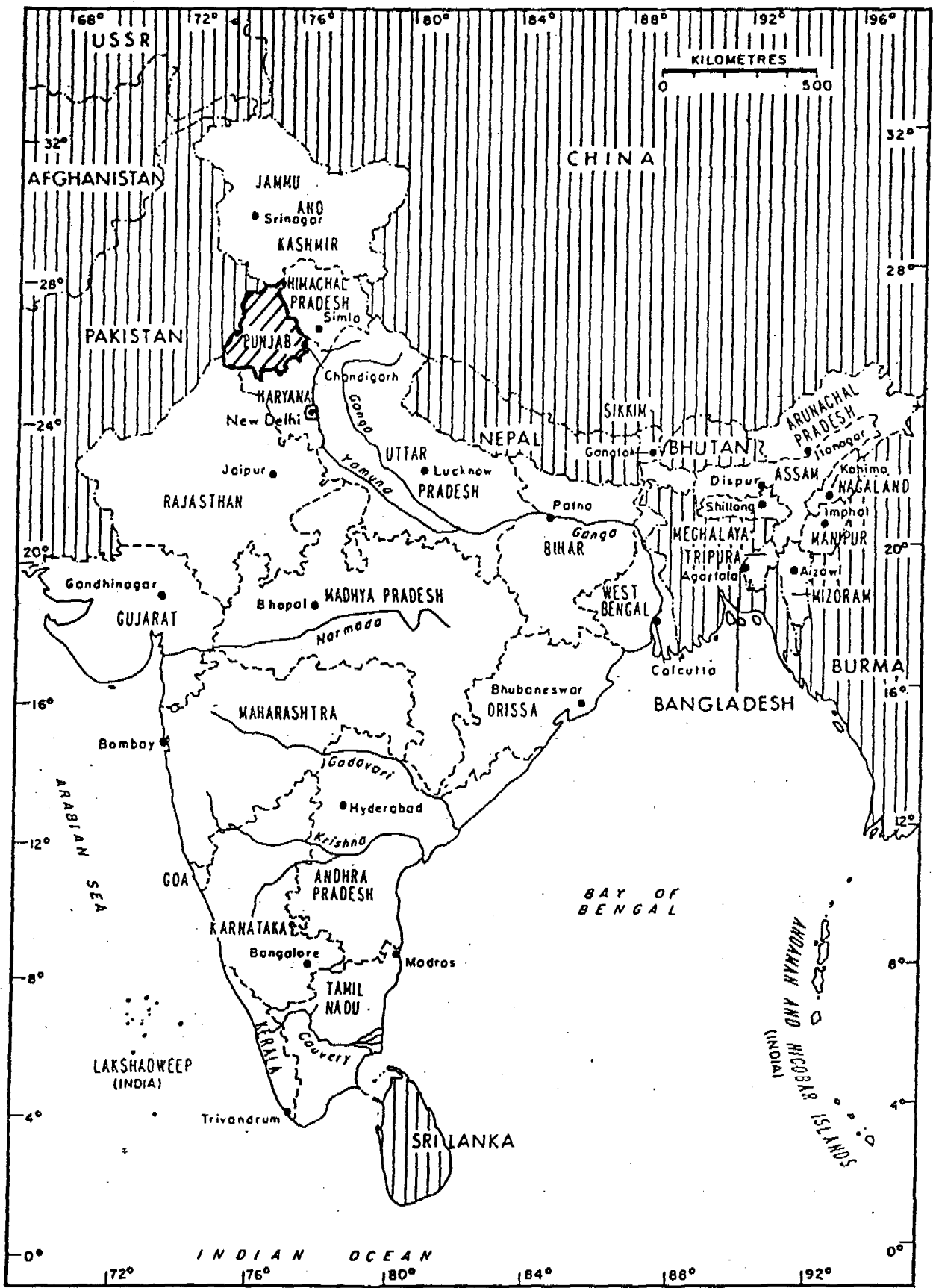
(Population and cost Rs. thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised.
1981-82			13.00	1 657.00
1982-83			28.00	3 000.00
1983-84			9.00	1 000.00
1984-85			5.00	525.00
1985-86			2.20	80.00
1986-87			2.00	80.00
1987-88			2.00	80.00
1988-89			1.00	80.00
1989-90			1.00	80.00
1990-91			1.00	60.00
Total			64.20	6 642.00

SANITATION

1981-82				
1982-83				
1983-84				
1984-85				
1985-86			4.40	220.00
1986-87			4.40	220.00
1987-88			4.40	220.00
1988-89			4.40	220.00
1989-90			4.40	220.00
1990-91			4.05	202.50
Total			26.05	1 302.50

STATE OF PUNJAB



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
PUNJAB

1. INTRODUCTION

The State of Punjab participated in the National Water Supply and Sanitation programme from its very inception in the year 1954. In the initial stages, only those villages were taken up where the underground water was very brackish and saline. Meagre outlays in 1st and 2nd five year plans of only Rs.31.85 and Rs.136.93 lacs respectively could help cover only 44 villages in the 1st Plan and 43 villages in the 2nd Plan.

A Rural Investigation Division was set up at Patiala in November 1962, which collected relevant data and prepared a list of the problem villages, which are being taken up for the provision of drinking water supply in the first instance.

Prior to 1976, drinking water supply and sewerage works in urban areas used to be carried out by the State P.W.D. Public Health Branch as deposit works out of the funds made available to it from time to time by the local bodies.

With the idea of facilitating financing and management of the water and sewerage works, the State Government set up Punjab Water Supply and Sewerage Board in September 1976. This Board undertakes the formulation, execution, operation and maintenance (in case the local body desires) of schemes relating to water supply and sewerage within the jurisdiction of local bodies.

The State, as it is today, was created as a result of reorganization of the composite Punjab State on 1st November 1966. It covers an area of 50,357 sq.kms. It is surrounded on one side by Pakistan and on the other by the States of Rajasthan, Haryana, Himachal Pradesh and Jammu & Kashmir.

Climate: The climate of Punjab is hot-temperate. The seasonal variation in temperature is from a minimum of 2°C in winter to a maximum of 45°C in summer. The average rainfall per year in the State is 24 inches varying from 44 inches in Dhar Block of Gurdaspur district to 8 inches in the south of Bhatinda district - about 70% of the rainfall is concentrated during the monsoon months (July to September) and 30% during the non-monsoon period of about 9 months.

Punjab is situated in the plains of the Indus valley and is a part of the watershed of Rivers Ravi, Beas, Sutlej and Ghaggar and the foothills of Shivalik. The State has almost a flat terrain.

2. SOCIO-ECONOMIC INDICATORS

The overall increase of population in Punjab has been as follows:

<u>Census year</u>	<u>Population (in lacs)</u>
1961	111
1971	135.28
1981 (Projected)	160.83
1990 (projected)	183.94

As against a decadal growth rate of 23.01 per cent recorded for the State as a whole, urban areas returned a growth rate of 43.66 per cent and the rural areas 16.59 per cent during 1971-81. If the growth rate of urban population noticed in the 1971-81 decade is projected into the next decade, the urban population in 1990 will go upto 65 lacs as against the projected figures of population of 53.12 lacs worked out on the basis of growth rate of 3.12%. The fund requirements for the Decade Plan will go up from the estimated Rs.206 crores to Rs.350 crores for the urban areas showing a gross under estimation and resultant sharp shortfall in physical achievements.

However, projected growth rate for the Decades 1971-81 and 1981-91 has been taken as per guidelines given by the Ministry of Works and Housing as 3.12% and 2.62% for urban sector and 1.48% and 1.045% for rural sector, respectively and the requirement of funds etc. has been worked out on the basis of this growth rate.

Income: The average per capita income in Punjab is the highest in the country and for 1979-80, at current prices, it was Rs.2361 as against an All India average of Rs.1300/-.

On the basis of the adopted yard-stick, Punjab has the minimum proportion of people living below the poverty line as compared to any other State of the country. As against the all India average of 48.13%, Punjab has about 15.13% people living below this poverty line. It is also note-worthy that statistically the economic condition of the people living in villages in Punjab is better than that of their counterparts in the urban areas. The percentage of people living below the poverty line in the rural areas is 11.8% compared to 24.66% in the urban areas.

Literacy: There has been a significant rise in the literacy in the State from 26.7% in 1961, to 33.67% in 1971 and; further to 40.74% in 1981. The increase in female literacy rate which rose from 17.4% to 25.9% to 34.4% in 1961, 1971 and 1981, respectively was higher as compared to the rise in male literacy rate which was 34.7%, 40.38% and 46.59% respectively in these years.

3. HEALTH ASPECTS

Life Expectancy: With the anticipated level of medical facilities available in 1981-85 and 1986-90, the estimated life expectancy as compared to that in the last five years is indicated below:

Expectancy of Life (Years)	1978-80	1981-85	1986-90
Male	56.2	58.5	60.7
Female	55.1	57.9	60.6

Morbidity and Mortality: The incidence of water and faecal borne diseases is as follows:

Year	<u>Polyomyelitis</u>			<u>Infectious Hepatitis</u>			<u>Diarrhoea</u>		
	OPD	IPD	Deaths	OPD	IPD	Deaths	OPD	IPD	Deaths
1978	2741	199	7	11873	1134	106	5,71,769	10,120	476
1979	2496	255	13	12397	1386	109	5,44,738	8,940	413
1980	2905	272	35	8031	1141	137	3,51,255	3,481	41

Year	<u>Dysentery</u>			<u>Typhoid</u>			<u>Para-Typhoid</u>		
	OPD	IPD	Deaths	OPD	IPD	Deaths	OPD	IPD	Deaths
1978	5,78,487	5,414	290	28,871	1,384	14	30,945	1,400	38
1979	9,15,395	5,988	307	33,815	1,820	29	42,270	297	27
1980	4,53,578	8,793	423	28,602	1,540	18	29,886	280	18

4. WATER RESOURCES

Punjab lies in the Indus valley Basin and is fed by three major rivers namely Sutlej, Beas and Ravi. Rivers Sutlej and Beas have already been tapped by the construction of major dams at Bhakra, Pong and Pandoh. A number of barrages/head works have also been constructed on these three rivers of the State. The State has a good network of canals which off take from the various headworks. The total availability of water from the rivers is 34.12' m.a.f. out of which Punjab has been allocated a share of 14.26 m.a.f.

As per a rough assessment made, the net water recharge available after deducting the losses i.e. loss due to evapotranspiration is about 9.576 m.a.f. and practically all recharge is being utilized through shallow and deep tubewells for irrigation.

Ground Water: The sub-soil level generally varies from 2 to 5m in the State. This value of depth of water table varies to a great extent in the northern and southern parts of the State. The depth of water table in some regions is even 25 to 30m. and even more.

5. PRESENT STATUS OF WATER SUPPLY AND SEWERAGE

Urban Water Supply & Urban Sanitation: There are 129 towns in the State, out of which 78 towns are having partial water supply and 54 towns partial sewerage system. The ground water forms source of water supply to about 86% of the served population (urban) of the State while the surface water only 14%. Out of the total population served with water supply i.e. 72%, 57% are having house connections and 15% obtain their water supplies through stand posts. The unserved population (28%) depend upon hand pumps, percolation wells and open ponds for their water supplies.

Similarly out of 39% served with sanitation, only 36% of the population is having access to sewerage system to dispose of their body wastes and used water, 3% use septic tanks as the method of excreta disposal.

Rural Water Supply: Out of the 12188 villages with a population of 103.10 lacs (as per 1971 census) in the State, 3712 villages have been identified as problem villages.

Population of these problem villages is 40.71 lacs as per 1971 census. Out of these, 2025 villages having population of 23.83 lacs have been covered with water supply by the end of March 1981, which in percentage terms comes to 20.12. The schemes are being designed for per capita supply of 40 to 70 litres per day and minimum terminal pressure of 8m. in the distribution system.

Finances and tariffs: All the rural water supply schemes are entirely financed by the State Government. Beneficiaries only provide the requisite land free of cost. A flat rate of Rs. ten per month per house connection is charged from persons who have got private house connections.

As on March 31, 1981, 146 water supply schemes covering 450 villages costing Rs.15.76 crores were in progress. Population to be benefitted by the completion of these ongoing schemes is 5.81 lacs. In addition to these, four projects costing Rs.5.98 crores, Rs.4.26 crores, 3.055 crores and 5.55 crores covering 76,61,71 and 87 villages and benefitting a population of 1.46 lacs, 0.75 lacs, 1.01 lacs and 11.57 lacs respectively are lying ready for execution. These projects have been submitted to Government of India for arranging bilateral assistance.

Rural Sanitation: At present there are no sanitary latrines in the rural areas of the State. In some villages, the village panchayats have constructed few bore hole type latrines for the women but the coverage with these is only negligible.

6. SECTOR ORGANISATION

Prior to 1976, the Public Health Branch of the Punjab Public Works Department (PWD) was primarily responsible for planning and execution of both rural and urban water supply and sewerage systems in the State. However, the responsibility for operation and maintenance of the urban water supply and sewerage systems was entrusted to the concerned municipal committees. With the creation of Punjab Water Supply and Sewerage Board (PWSSB) in November 1976, the responsibilities of the Public Health Branch were reallocated. The broad divisions are indicated below:

Rural Water Supply: This wing of the Public Health Department (PWD) known as FWDRWS, has a Chief Engineer as its head. The Chief Engineer is directly responsible to the Government for planning, designing, construction, operation and maintenance of rural water supply schemes in the State. The administrative control vests with the Secretary to the Government Public Works Department (Public Health Branch) under the Minister of Public Health.

Rural Sanitation & Public Health Activities of the Government Departments: This wing of Public Health Department known as PHDGW is also headed by a Chief Engineer and is responsible for rural sanitation and public health engineering activities of various government departments. His responsibility includes water supply and sewerage works in industrial and urban estates, housing colonies and providing water supply and sanitary installations in Government buildings including maintenance of these works in a majority of cases.

Urban Water Supply & Sewerage: The Water Supply & Sewerage Board (WSSB) is responsible for planning, design and construction of water supply and sewerage works in all the urban areas of the State and laying down norms for maintenance of water supply and sewerage works for the guidance of local bodies.

7. DECADE PLAN & TARGETS:

Coverage proposals (for urban population) year by year and from planning cycle to planning cycle (on the basis of 1990 projected population) are given below:

Year		New Population covered in 000's	
		Water Supply	Sanitation
VIth			
Five)	1981-82	132	289
Year)	1982-83	152	305
Plan)	1983-84	87	107
	1984-85	90	116
Total for 1981-85		461	817
VIIth			
Five)	1985-86	301	299
Year)	1986-87	301	299
Plan)	1987-88	301	299
	1988-89	301	299
	1989-90	301	299
Total for 1985-90		1505	1495
VIIIth	1990-91	301	300
Five			
Year			
Plan			
Total for Decade		2267	2612

Target population coverage indicates a total of two figures i.e. population which was still to be served as on 1.4.1981 and the projected increase of population from 1.4.1981 to 31.3.1991. The target urban population to be covered during the Decade with new water supply facilities is 2,267,000 persons. This will bring a total coverage to 5,312,00 persons by the Decade end. The target urban population to be covered during the decade with new sanitation facilities is 2,612,000 persons. This will bring the total coverage to 4,250,000 persons.

Coverage Proposals (Rural Population), Coverage Proposals yearwise and population-wise are as given under:

Year	Rural Water Supply (Population in 000)	Rural Sanitation (population in 000)
1981-82	72	-
1982-83	114	-
1983-84	232	-
1984-85	251	100
1985-86	880	300
1986-87	980	400
1987-88	1945	500
1988-89	2100	600
1989-90	2200	700
1990-91	1925	671
Total	<u>10699</u>	<u>3271</u>

Rural Water Supply: Total remaining population (target population) to be covered during the Decade is 10699 thousands. Out of this, 2529 thousands population relating to problem villages has been accorded priority and this population is proposed to be covered in first six years of the Decade, which are last four years of Sixth Five Year Plan and first 2 years of 7th Five Year Plan and 6245 thousands population is proposed to be covered in the remaining three years of 7th Five Year Plan and remaining in the first year of 8th Five Year Plan.

Rural Sanitation: It is proposed to cover 100 thousand population in the remaining four years of the 6th Five Year Plan. Coverage in the 7th Five Year Plan has been proposed as 2500 thousands. 671 thousand population will be covered in first year of Eighth Five Year Plan. Total target population is 3271 thousands.

8. DECADE PROGRAMME FUNDING

The investment costs for the urban sector for the targetted coverage with proposed service levels and stated unit costs are indicated in the enclosed table.

The total investment involved is Rs. 206 crores (at 1980 price level) with the following break-up:

	<u>New Schemes</u>	<u>Augmentation Schemes</u>	<u>Total</u>
Water Supply	Rs.78.44	Rs. 25.70	Rs. 104.14
Sanitation	Rs.88.62	Rs. 13.53	<u>Rs. 102.15</u>
	(Figures in Crores)		Rs. 206.29
		Say	<u>Rs. 206 crores.</u>

In the 6th Five Year Plan (1980-85) urban water supply and sanitation sector has been allotted a provision of Rs. 65.33 crores (3.25% of the total plan outlay).

Amount spent during 1980-81	= Rs. 15.80 crores
Net Plan provision available during the first four years of the Decade	= 65.33 - 15.80 = Rs.49.53 Crores

For the Rural sector an amount of Rs. 68 crores has been provided in the Sixth Development Plan under State Sector & Rs. 4.585 crores under Central Sector.

Resources Requirement (Urban Sector)

The additional resources required beyond the 6th Five Year Plan are Rs. 157 crores (207-49.53 = 157) at 1980 price level in addition to meeting the additional requirements as a result of cost escalation, to achieve the Decade targets. However, actual requirement of funds in

the last six years of the Decade will be about 244.00 crores. To mobilize the resources required a number of recommendations have been made by the Working Group on Financial Resources set up by the Apex Committee on IDWSSD, Govt. of India to the State and Central Govt. which include, stepping up of allocation to double than what has been provided in the current plan, persuading the LIC to earmark more funds for investing in water supply and sanitation sector, fixing water rates by the Municipal Bodies so that these rates ensure repayment of loan with interest etc., setting up of a national level refinancing/financing institution: on the lines of Housing and Urban Development Corporation/Rural Electrification Corporation, etc.

The other measure is, the municipalities should treat water as a saleable commodity, which they have not been treating hitherto and levy suitable water and sewerage tariffs based on the consideration of enough cash generation to cover not only operational and maintenance costs but also provide for building up a reserve fund for renewal and replacement. Further, these municipalities are reluctant to realize the arrears of water supply and sewerage charges. The local bodies should launch vigorous recovery drives to recover all such arrears.

Resource Requirement (Rural Sector)

Total amount required for the coverage of population both for Rural Water Supply and Rural Sanitation is Rs. 240.57 crores. Provision made in the Sixth Plan for the first four years of the Decade is Rs. 69.08 crores. But it is not certain that this amount will be actually released. Present releases of funds for the RWS is of the order of Rs. Four to Five crores annually. On these basis only an amount of Rs. 50 crores will be released for Rural Water Supply and Rural Sanitation sector by the State Government in the entire Decade period. The gap in the resources will be $240.57 - 50 = 190.57$ crores. Thus additional resources to the extent of Rs. 190 crores will have to be raised.

ANNUAL PHASING OF DECADE PROGRAMME

(Population and cost in thousands)

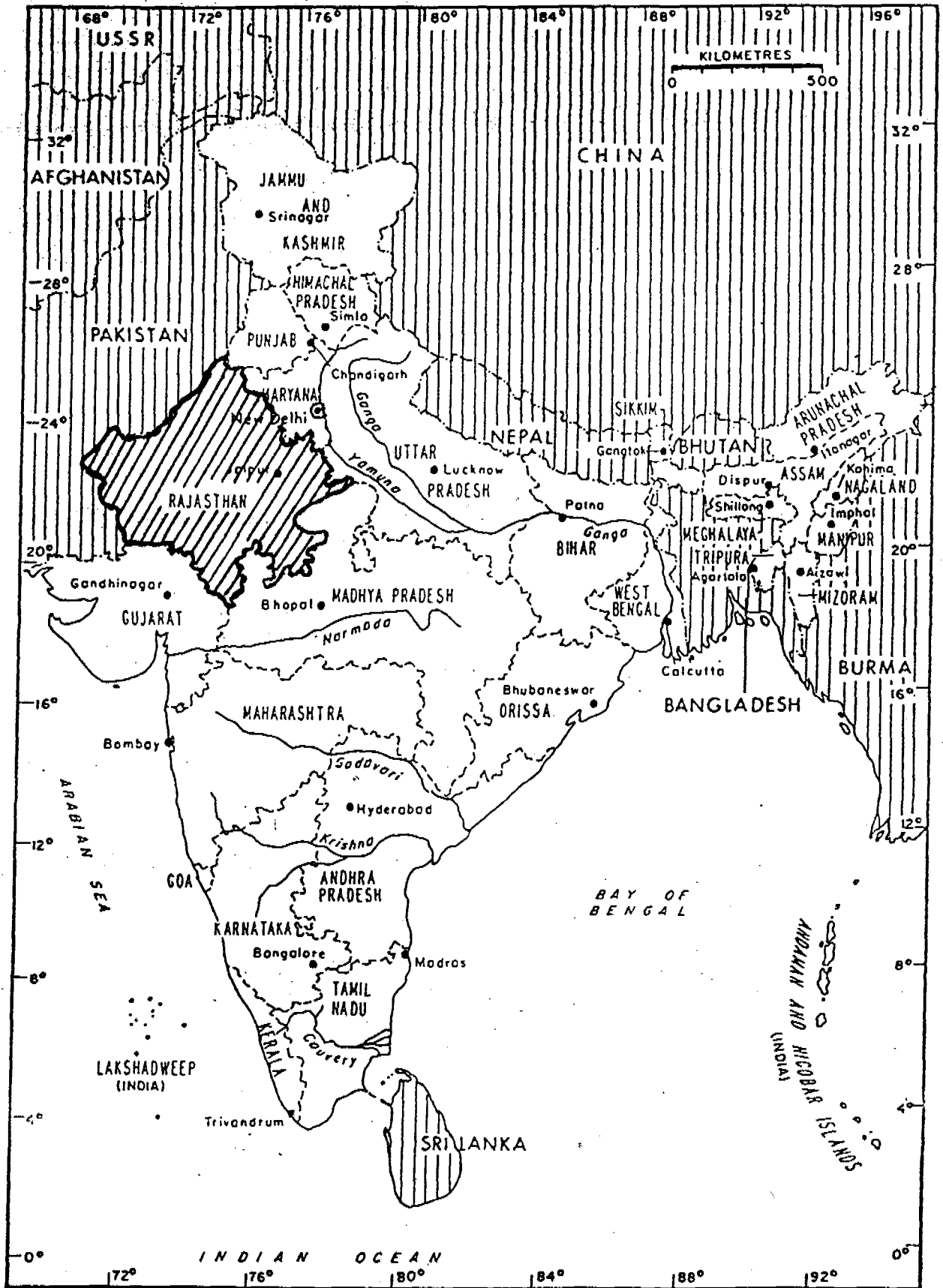
A. WATER SUPPLY

Year	URBAN		RURAL		
	Population to be covered	Capital cost to be utilized	Population to be covered	Capital Cost to be utilized	
1	2		4	5	
	New	Augmentation			
1981-82	132	163	60900	72	59819
1982-83	152	188	70300	114	46338
1983-84	87	107	40100	232	88000
1984-85	90	110	41400	251	100000
1985-86	301	362	138000	880	210000
1986-87	301	363	138000	980	245843
1987-88	301	363	138100	1945	350000
1988-89	301	363	138100	2100	380000
1989-90	301	364	138200	2200	400000
1990-91	301	364	138275	1925	362200
Total	2267	2747	1041375	10699	2242200

B. SANITATION

1981-82	289	167	100100	-	-
1982-83	305	176	105600	-	-
1983-84	107	61	36900	-	-
1984-85	116	67	40000	100	5000
1985-86	299	172	123000	300	15000
1986-87	299	172	123100	400	20000
1987-88	299	172	123100	500	25000
1988-89	299	172	123200	600	30000
1989-90	299	173	123200	700	35000
1990-91	300	173	123255	671	33550
Total:	2612	1505	1021455	3271	163550

STATE OF RAJASTHAN



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
RAJASTHAN

1. INTRODUCTION

After independence and formation of Rajasthan State in the year 1949, due importance has been given to drinking water supply. The State Public Works Department was entrusted with the task of providing drinking water supply arrangements for urban towns. Subsequently in the year 1963, the State PHED was created to look after water supply in both urban and rural sectors.

Rajasthan is the second largest state in India covering an area of 3,42,214 sq.km. The State forms part of the Western border of India with Pakistan. The Aravali Range running North East to South West divides the State into almost two equal halves. The zone west of Aravali is the desert and the east zone of Aravali is partly hilly and partly semi desert.

The average annual rainfall varies from as low as 5 to 8 mm in the desert district of Jaisalmer to 150 mm to 200 mm in hilly areas of Sirohi district. Similarly, the temperature varies from as low as 4°C in winter to as high as 50°C in summer. The State is rich in minerals like asbestos gypsum, dolomite, quartz, rock phosphate, sand stone, soap stone, feldspar, mica, zinc, lead, copper and silver.

2. SOCIO-ECONOMIC INDICATORS

The projected population as on 31.3.81 is 33.45 millions. In the year 1991 the total population will further increase to 41.604 millions. The density of population per sq. km. for the State was 75 (1971 census); only 63 for the rural areas and 1198 for urban areas. A high percentage of 82.37% of the population lives in rural areas.

The average per capita income is Rs.1025. The population below the poverty line is 33.7%.

Famine is a regular phenomenon for the state and in general drought conditions prevail in the Western and Southern districts of the State. In the desert areas, water table is extremely low generally between 80 M to 130 M deep and in extreme cases upto 200 M. deep.

As per 1971 census average literacy in the State was 19.03 percent, as against 29.46% for All India. Male Literacy was 28.74% and Female 8.46%. In the rural area male literacy was 22.87% and female only 4.03%. The percentage of literacy has now reached 24.05%.

3. HEALTH ASPECTS

The vital statistics for public health show that the crude birth rate per 1000 is 35.5 and death rate is 15.6. The infant mortality rate per thousand is 140, i.e. 86 for urban and 153 for rural. These figures are based on 1981 assessment.

4. WATER RESOURCES

Rajasthan has hardly 1% of country's total surface water resources. The state can be classified into 4 major basins and the total runoff available from the surface precipitation has been assessed as 10579 million cubic meter. River Chambal is the main perennial river in the state, others being mainly seasonal.

The south central and eastern part of the state is of igneous & metamorphic rocks and the yield from the dug wells have meagre discharge. The eastern part of the state comprises of shallow water level and the dug wells in these area have yield of 2000 to 8000 litre/hr. The tubewells in Barmer & Jaisalmer have been found to yield 100000 to 200000 litres/hr.

The ground water potential of the State is about 81000 cu.sec.

5. PRESENT STATUS OF WATER SUPPLY AND SANITATION

By March, 1981, the State Government had provided drinking water to 65.7% urban population and about 36% rural population. Due to limited financial resources the State Government has been able to pay very limited attention to the sanitation sector and about 5% of the entire urban population only is provided sanitation facility.

The service level of various towns on the basis of 1981 population and quantity of water being supplied at present is as follows:

5% of towns @ 25 lpcd, 30% of towns @ 50 to 75 lpcd,
25% of towns @ 75 to 100 lpcd and 10% of towns @ 100 lpcd
and above.

The water supply schemes are designed for a period of 30 years from the year of its commissioning.

The total numbers of villages are 37124 vide 1981 census. As on 31.1.83, 14550 villages have been commissioned. Only 15% of the rural population obtained its requirement of drinking needs on House Connections and the remaining 85% population obtains water either through public stand posts or through a centrally located ground water reservoir. No sewerage system is available in rural areas. The general average service level in rural water supply scheme is 50 to 70 lpcd.

6. SECTOR ORGANISATION

In the State, the projects are being sanctioned by the Rajasthan Water Supply and Sewerage Management Board through its various Committees. The sanctioned projects are implemented by the State Public Health Engineering Department.

The materials for construction are arranged by the State Public Health Engineering Department and given to the contractor on rates mentioned in the tender documents. For procurement of the materials, there is a Materials Management circle in the department headed by a Superintending Engineer. Skilled and unskilled man power required for execution of works is available in abundance in the State.

The work of management of the urban water supply schemes is also within the scope of the State PHED. The operation & maintenance of practically all (99%) of urban water supply spot source schemes (hand pumps, power pump in nearby well and a ground level reservoir with taps) is done by the local bodies (panchayats) and the O & M of bigger rural schemes (regional schemes covering more than one village & schemes with overhead reservoir with house connections) is done by State PHED. For ensuring proper quality of water distributed to the consumers sufficient staff and laboratories are available in PHED.

Preliminary and detailed feasibility studies have been carried out in collaboration with International consultants for IDA assisted water supply projects for the four towns (1) Jaipur scheme, (2) Bikaner, (3) Jodhpur and (4) Kota Reorganisation scheme.

Sewerage schemes in five towns viz. Jaipur, Kota, jodhpur, Bikaner and Utaipur were under execution and only part of the population residing in these towns were benefitted by these schemes.

7. DECADE PLAN & TARGETS (POPULATION COVERAGE POSITION)

Under the decade plan the targets for population coverage of the various sectors have been laid down as follows:

Particulars	Population Coverage by March 1981	Target Population Coverage by March 1991
a) Urban Water Supply	40.59 lacs	80.69 lacs
b) Rural Water Supply	98.92 lacs	335.35 lacs
c) Urban Sanitation	2.98 lacs	64.55 lacs
d) Rural Sanitation	-	83.84 lacs

Plan outlay: The total cost involved to achieve the targets of the decade plan is Rs.721 crores. The sectorwise break up of cost is as follows:

1.	Urban Water Supply	Rs. 8804.05 lacs
2.	Rural Water Supply	Rs. 39917.10 lacs
3.	Urban Sanitation	Rs. 19197.95 lacs
4.	Rural Sanitation	Rs. 4192.00 lacs
	Total	<u>Rs. 72111.10 lacs</u>

Allocation of Funds in Plan: The plan provisions for the various plans for different sectors is as under:

Particular	Urban (Water Supply and Sanitation) (Rs. in lacs.)	Rural (Water Supply) (Rs. in lacs.)
Fifth five year plan (75-80)	2288.50	5485.76
Sixth Five Year Plan (Tentative allocations)	8940	18800.75

Resource requirements: The provision for Sixth Five Plan is about 10% of the total sixth five year plan of the state. With the present allocation, the state Govt. would not be able to meet the targets laid down for the decade plan and additional resources would have to be generated to achieve the targets. Funds to the tune of Rs.300 crores approx. would have to be mobilised.

Phasing: The phasing of the plan provisions has been done keeping in view the availability of funds, man power and materials. Initially stress has been laid on coverage of rural water supply. Later, the stress shall be given to the sanitation programme.

8. DECADE PROGRAMME FUNDING

As already explained, huge capital investment is required to achieve the targets of decade plan and solve the water supply and sanitation problem of the State. The State Govt. is, however, committed to provide safe drinking water and proper sanitation to the public. The State Govt. is dependent upon financial assistance from agencies such as Life Insurance Corporation, World Bank and Bilateral assistance. Central Assistance in the form of aid and loan shall also play a very important role in achieving the targets. Aid from World Bank has already started flowing in and a package project costing 130 crores is under execution. Similarly dialogue has been opened with the Netherlands Govt. and aid is likely to commence in 1982-83.

The mobilisation of resources has been proposed as under to meet the targets of the decade plan:

S.No.	Particulars	(kg. in crores)
1.	State resources)	380
2.	Central assistance)	
3.	World Bank	50
4.	LIC assistance	100
5.	Bilateral assistance	200
	Total	730

9. SUPPORT PROGRAMMES

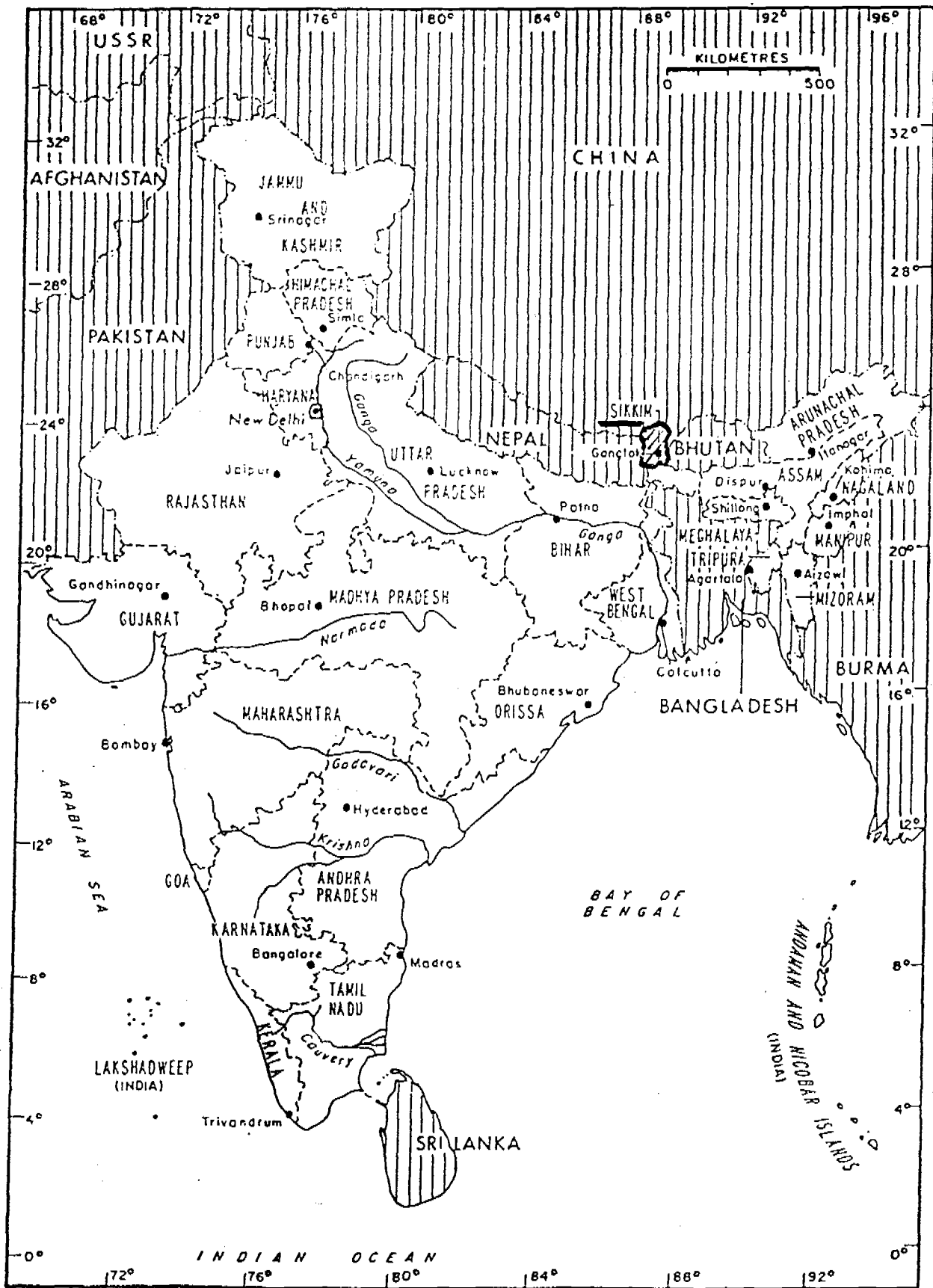
To achieve the gigantic task apart from financial resources due consideration to other support programmes like man power, materials, implementation & monitoring system, co-ordination with other agencies. etc. can not be overlooked and the development in these fields shall have to be given due importance.

The State Govt. should include this programme in schools to acquaint the students with the necessity and importance of such programmes and to impart them knowledge of their responsibilities towards operation, maintenance and proper up keep of the system.

The rural population should know a little about the importance of safe drinking water and adequate safe drinking water and adequate sanitation requirement for general health. Health education should be imparted by means of literature, Radio, T.V. Audio Visual aids etc. so that such programmes are successful.

A general women's development programme should go side by side with the implementation of urban and rural sanitation and water supply projects.

STATE OF SIKKIM



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
SIKKIM

1. INTRODUCTION

Sikkim is situated at the North Eastern Border of India.

It is land locked, surrounded by Bhutan on East, Nepal on West and State of Bengal on South.

Area of the State is 730,000 Hactares.
Habitable area is less than 40%. Rest of the area is filled with cold mountain ridges, jungles, slips and sinking areas.

Nearest airport and railhead is Siliguri which is 117 km south of State capital, Gangtok. It takes about 4 hours to cover this route by vehicle.

Calcutta is the nearest major city.

Most of the habitable areas of the State falls within the temperate climatic zone.

On the average temperature ranges from 3° C to 30° C. Rainy season lasts for over 6 months, starting from middle of October. Peak monsoon occurs during July/August.

The intensity of rainfall in most of the area is as high as 75-100 Cms./hour and peak intensity can reach within 10 minutes and may remain sustained for as long as 3 hours at a time.

2. SOCIO-ECONOMIC INDICATORS

The projected population of the State is 3,10,000 people as per 1981 projection, achieved with an 4.35% annual growth rate, acceleration in growth rate picking up after 1971.

It is anticipated, the growth rate will be 6.64% and allow 1991 population to reach 3,97,000.

Sikkim has been divided into 4 districts, viz., North, South, East and West. The East District is the most populous, having population density of 145 persons per sq. km. North District has the least density of 6 persons per sq. km. South and West Districts showed growth rate 32 and 23% respectively.

State of Sikkim comprises of 8 nos. of declared towns, 55 nos. of RMCs (Rural Marketing Centres) and 403 nos. of villages.

The State average for per capita income estimates during 79-80 was Rs. 968/- at the current price. There is no survey report available to ascertain the poverty level in the State.

Entire state has hilly terrain and is circumscribed by great Himalayas and snow clad mountains, on the Western, Northern and Eastern Fronts. Along Nepal, Sikkim border, Mt. Kanchanjunga is the highest peak (8586 m). Southern prong of the State has the mountains of lower attitude which mainly form terrain of the plains.

The hill slopes are scared with hundred of temporary rivulets and springs which often occur at the frequency of 10-25 rivalets or ghoras at every 3-5,000 ft. of stretch. Added to this, fast flowing rivers contribute to the errosion of toe of the hill slopes, resulting into mass and destructive land slides further aggravated by earthquakes.

3. HEALTH ASPECTS

With the beginning of 5th Plan there has been considerable headway made in improving themedical facilities in the State. Against only two hospitals in 1954, now there are total of 5 hospitals, 15 primary centres and 37 nos. of dispensaries and health centres in State. Doctors/population ratio in the state is 1:4,000. There, however, still appears lot of scope of works to improve the health of the people in general.

There is no statistical data in life expectancy of the people in the State. Expertised view is to take the National figure for this as 57 years.

Experts view on morbidity and mortality on account of water-borne disease has been quite omniuous. It is viewed due to cultural attitude of the people which prevent them from going to hospitals and seek remedies, the statistical data on morbidity and mortality may not represent the true figure and the actual figures are suspected to be quite high. The Directorate pointed out that mica flakes and lack of chemical balance in the water have been the prime reasons for dysenteries, goiters, and dental cavities, etc. A survey report has shown 37 nos. of people suffereing from indine deficiency and goier cases in same areas.

The incidence of major water-borne diseases has been significant in 1980

Dysentery	-	14357 cases	-	5 deaths
Typhoid		550 "	-	-
Gastro Enteritis-		15796 "	-	4 "
Infective Hepatitis	-	1573 "	-	3 "

4. WATER RESOURCES

There is no survey report available with respect to water resources available in the State. The work in this respect has just begun. Water to the people is available more or less from the surface water resources in the form of springs, revulets and rivers. The water becomes abundant during the heavy precipitation when storm water charges the entire region.

The State is not hydrogeologically mapped and hence the ground water bearing zones and their potentials are unknown. The geology of the state is yet to come into stabilized state. The thrust and faults often result into change in topography. The ground water is generally available in the factured zones. But this phenomena is also of temperary nature, because the water drains out owing to steep slops very quickly at lower ends of the hill slopes. The Rural Development Department had, ending March 1981, excavated about 35 number of dug wells having shallow depth of 2.4 to 4.2 m with discharge of 0.6 to 2.0 cum/hr from 27 nos. of its successful wells. As the ground water withdrawls are from shallow aquifers, the sources dry up in summer and the results, therefore, cannot be considered as representative. The State Government is making efforts to develop ground water sources and proposes to prepare hydrogeological map to identify potential sites of ground water-storages.

Almost all the water available to the consumers come from the surface water resources. During the heavy precipitation storm water charges the entire region and spring sources. However, during winter all the supplies become less and dry up creating heavy scarcity of water in many regions.

5. PRESENT STATUS OF WATER SUPPLY & SANITATION

<u>Status as on 31.3.1981</u>	
<u>S.N.</u>	<u>Particulars</u>
a.	Nos. of villages (Problem 403 Nos.
b.	Nos. of villages covered as on 107 Nos. 31.3.80
c.	Population covered 48,000
d.	Yet to be covered villages 296
e.	Population to be covered 171,000

24 thousand persons in urban areas have been provided with water supply facilities as on 31.3.81 which is 22.42%. As regards sanitation, there is no appreciable facilities in both urban and rural areas.

In congested towns like Gangtok, the septic tank system is however proving ineffective. This is due to close built up sections. Unscientific designs of the units, and excessive rainfall. The affects from tanks have been therefore creating neusance in Gangtok and other congested urban towns.

There is only one sewerage system under construction for Gangtok. The first phase of this scheme will cater for 25,000 people. The scheme when completed to its entirety will cater for the population of 75,000 people.

Sanitation and Sewerage Programme in the urban towns and RMCs are extremely essential due to very rapid growth of these communities. For 7 nos. of urban towns it is proposed to construct alternate sewer system with suitable disposal units consisting of community septic tanks, in half tanks or other such units. It is found individual septic tanks of public latrines are not effective for catering the population. It is, therefore, felt sewerage of such congested areas and taking the sewage to a single treatment for disposal maint away from population will be more effective and economical.

6. SECTOR ORGANISATION

There are two sector organisations relevant to water supply and sanitation and sewerage works in the state as mentioned under:

(a) Building Water Supply and Housing Department

This department is responsible for Urban sector. The department, apart from water supply and sanitation also deals with buildings and housing schemes. Only at Gangtok a division exclusively looks after the water and sewerage works, in rest of the districts, all the Divisions are also responsible for water supply, sanitation as well as Building construction schemes. Till now this arrangement has been justified due to comparatively less work load, however, future expansion of the department is on the offing to create separate divisions, to deal with water and sanitation works.

(b) Rural Development Department

The Department is responsible for various Rural Schemes e.g. road, bridges, construction as well as water supply and sanitation works.

There are only two Divisions to deal with water supply as well as other multifarious aspects of Rural works. The Department, needing expansion is gearing up to decentralize its administration and incorporate more Divisions/Sub-Divisions to deal with the expanding Rural Development Schemes.

7. DECADE PROGRAMME TARGETS

With a view to meeting the Decade goals of 100% water supply to urban towns and 80% - 25% sanitation facilities to urban towns and rural areas respectively. Decade plans for various works are completed/prepared summarized as follows:

i) Urban Communities: Urban Water Supply and Sanitation.

The numbers of communities to be covered are -

- a) Gangtok
- b) 7 nos. of urban towns; and
- c) 55 nos. of RMCs.

In all these urban areas with a target population of 154,000 people will be provided with water supply facilities as on 31.3.91.

ii) Gangtok Water Supply

Total population coverage shall be 75,000 people. The Decade Plan will aim at providing full fledged new water supply schemes to cater for the 51,000 people. Augmentation schemes shall be taken upto cover remaining 14,000 people.

In regard to sanitation, a target population of 43 thousand people of urban areas will be provided with sanitation facilities by 31.3.91.

8. DECADE PROGRAMME FUNDING

Investment of cost for Decade Programmes has been estimated to be Rs. 28.905 crores.

The cost has been calculated on the basis of unit cost, type community and population.

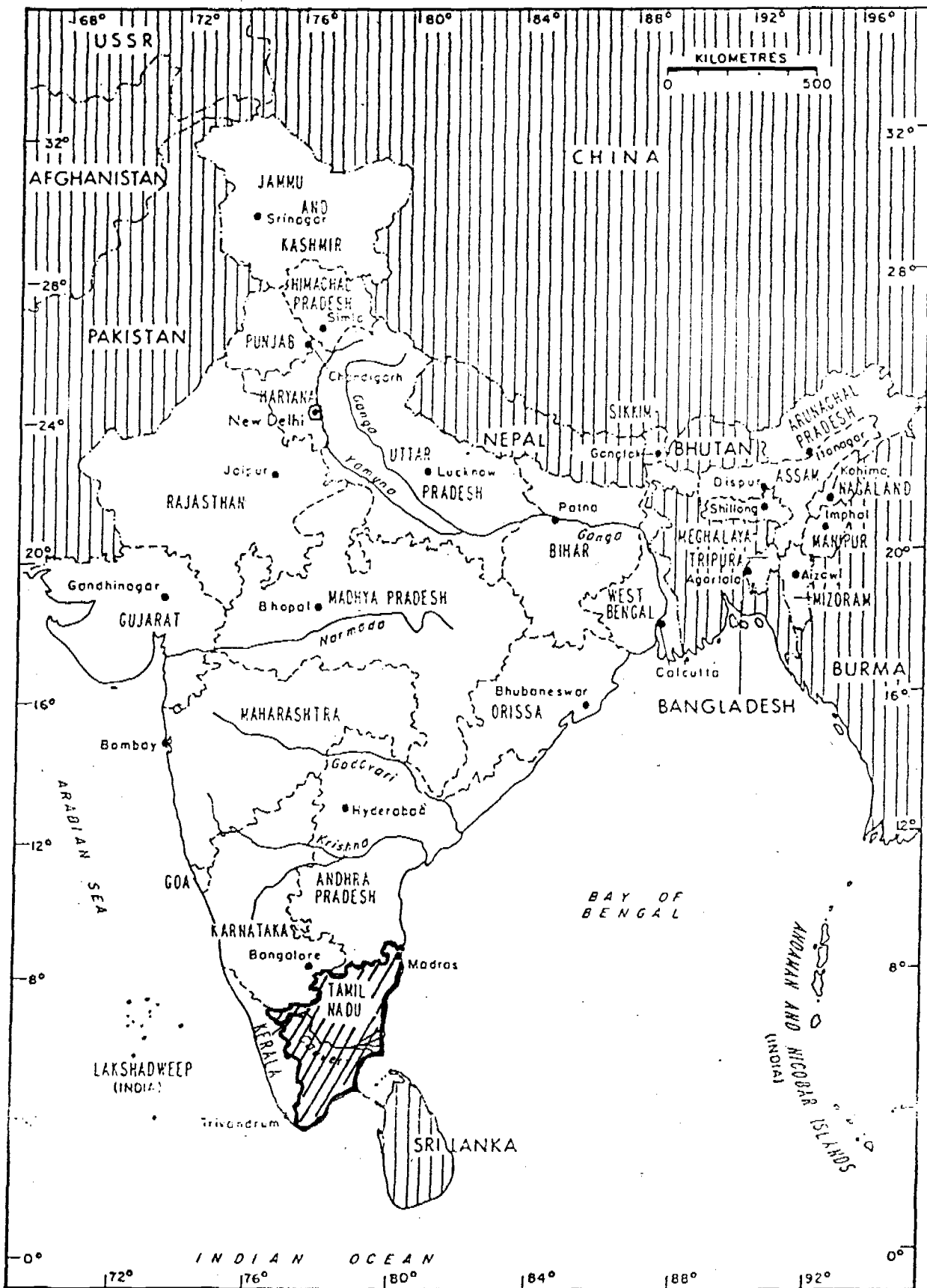
In the 6th Five Year Plan outlay, it is seen that Rural Sector has been provided with adequate financial resources, which is 96.43% of the requirement for the Decade period. The plan outlay for urban sector is 18.64% of the Decade requirement. During 6th Plan, Rs. 9.5 crores have been provided under State Sector and Rs. 4.0 crores under Central Sector ARP funds.

The coverage of the population will be as per the norms for the Nation. Efforts shall be there to provide water supply, sewerage and sanitation facilities to the public at the maximum level of services, namely, adequate supply of water 24 hours a day catering the fire fighting, industries and commercial needs. Similarly, full fledged sewerage

schemes in Gangtok and other sanitation facilities for other urban and rural communities will be provided. Proposed annual plan outlay for the Decade Programmes including population will be given after discussion.

Internal generation of resources is negligible. So far there has not been any work undertaken with loans from any financing agency. There have been a few schemes under Rural Sector which were executed from the resources obtained from lending agencies namely UNICEF. The State is therefore fully dependent upon Central Grants and aids.

STATE OF TAMIL NADU



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
TAMIL NADU

1. INTRODUCTION

Tamil Nadu is at the South East extremity of the Indian peninsula bordered by the States of Andhra, Karnataka in the North, Kerala in the West, Indian Ocean in South and Bay of Bengal on East. Because of its proximity to the equator, the influence of hot sun makes Tamil Nadu Tropical. Tamil Nadu has the longest coast line. About 75% of the area is Rocky and the rest alluvium. In a year, only about 55 days are rainy and average rainfall in the year will be around 950 mm. With the maximum bound of 1750 mm and the minimum bound of 500 mm. Tamil Nadu covers an area of 1300,60 sq.km.

The population of Tamil Nadu as per 1971 census was 411.93 lakhs. The projected population of Tamil Nadu for 1981 is 473.04 lakhs.

The projected population for 1991 is taken as 530.18 lakhs at a growth rate of 1.208% per annum. The reduction in growth rate in Tamil Nadu in 3 decades can be attributed to the increase in literacy and consequential awareness among the people about family planning.

2. SOCIO-ECONOMIC INDICATORS

The distribution of population between urban and rural as per the Census of India is as follows:

	<u>Population in thousands</u>		
	<u>1971 census</u>	<u>1981 projected</u>	<u>1991 projected</u>
Rural	28686	31,382	33245
Urban	12442	15,922	19773
Total	41128	47,304	53018

The developmental activities in Tamil Nadu since the first five year plan had substantial and appreciable growth. Particularly the development in Agriculture, Irrigation Power Generation, Industries and Education are commendable.

At the current prices, the annual average compound growth rate of State income from 1970-71 to 1978-79 was 10.3%. But estimated at constant (1970-71) prices. The rate for period 1970-71 to 1978 -79 was 3.6%.

3. HEALTH STATISTICS

Growth of population is generally based on birth and death rates in an area Infant Mortality rate is a sensitive index of Health status of a community. In addition incidences and mortality due to various diseases also enable assessment of health status of the population.

The birth and death rates and Infant Mortality rate for Tamil Nadu for 1981 are at follows:

B.R.	D.R.	IMR
26.1	10.9	81.2

Special central programmes are available for control of malaria cholera virus Encephalities and water borne diseases. Expanded programme of immunisation aims to reduce the mincidence and mortality due to whooping cough tetenus. etc..

4. WATER RESOURCES

In Tamil Nadu the annual average precipitation is 945.7 mm. This precipitation in the total of the South, West and North East monsoon. Monsoon periods of varying precipitation and their vagories control the surface water regime and around water recharge. About 750 mm of the yearly rainfall percolates into the soil. Regarding the potential of surface water, almost all the rivers rise from the Western Ghats in Karnataka and Kerala. These rivers are rainfed only and hence discharge will be only during monsoon months. Except Cauvery and Tambraparani all the rivers dry up during most part of the year. The following table illustrated the flows in the rivers.

River	Flow	Percentage of Yield		
		June to Sept.	Oct. to Dec.	Jan. to May
1. Cauvery	M. Cu. m			
a) Mettur Reservoir	10,785	68	24	8
b) Grand Anicut	11,002	57	23	10
c) Coleroon	4,413	43	45	12
2. Bhavani	2,274	53	29	18
3. Palar	135	7	90	3
4. Vaigai	1,102	25	49	26
5. Tambraparani	821	17	55	28

Tamil Nadu is not rich in ground water sources also. Most of the inland rivers of the state have hard rock substratum which can yield only very limited quantities of water. About 70% of the area of the state is of Archaean formation made up of granite varieties which does not permit water to percolate easily. About 20% of the area of the State is of creataceous formation which consists of tertiary and alluvium types. This only permits moderate to good development of ground water sources. UNDP has conducted extensive studies in selected basins. It has been estimated that the total annual ground water recharge in the state is 18,500 M.cum in normal year. Out of this present extraction is 12500 M.cum leaving a balance of 6000 M.cum for irrigation, industrial use etc.,

5. PRESENT SITUATION OF WATER SUPPLY AND SEWERAGE

The 1971 census population of Tamil Nadu was 411.28 lakhs in which 124.42 lakhs people live in 439 urban cities and urban agglomeration. The projected population for 1981 was 473.04 lakhs of which 159.22 lakhs expected to live in urban cities and urban agglomeration.

Urban Water Supply: By the end of March 1981, 176 towns have been provided with water supply and the population benefitted was 128.98 lakhs. The supply made available in almost all the towns are not adequate. The shortfall in requirement is met from private wells, irrigation wells etc..

Rural Water Supply: The census of India has reported that as per 1971 census the rural population was 286.86 lakhs. The projected population for 1981 is 313.82 lakhs. In Tamil Nadu the Rural Water Supply was in vague since 1895. However till 1980 there was no appreciable performance in providing water supply in the rural areas. But importance of providing protected drinking water supply was very much felt from the year 1976-77 and it gained momentum in subsequent years. During the year 1976 the State Government conducted a scientific survey of the rural water supply status which revealed that there are 47075 rural habitations in 15735 census villages available in Tamil Nadu. Out of this 18167 habitations falling under types 1 to 5 in 7226 census villages are really problem areas for drinking water. Upto March 1980, 577 problem villages having 3465 habitations were provided with water supply. At the beginning of VI Five Year Plan there were 6649 problem villages having 14702 problem habitations. It is proposed to provide water supply to all the problem habitations before end of the VI Five Year Plan. The State Government provided under Minimum Needs Programme Rs.5000 lakhs and the Government of India under Accelerated Rural Water Supply Programme provided Rs.2667 lakhs. To meet the shortfall the Government of Tamil Nadu is diverting funds from self sufficiency programme. From 1971-72 to March 1983, 18163 habitations were covered and the population benefitted was 135.875 lakhs.

Percapita supply provided ranges from 25 to 60 lpcd. The entire rural population so far provided with water supply are covered by Public Stand Posts or hand pumps only. As on 31.3.81, 64.56 lakh people in rural have protected drinking water supply facilities.

Urban Sanitation: By the end of March 1981, the organised sanitation facilities were made available in 13 towns benefitting a population 74.56 lakhs. All the above towns are having treatment works. Regarding the towns served with waterseal toilets connected to septic tanks, authenticated reports on the existing individual sanitary systems are not readily available. Hence it has been assumed that 18% of population lying in urban areas uncovered by sewerage waste water disposal system will have their own sanitary system of disposal.

Rural Sanitation: Provision of Rural Sanitation in Tamil Nadu is yet to be done. The Directorate of Public Health and Preventive Medicine have set up a Research-cum-Action Project at the Health Unit Poonamalle to propagate the adoption low cost sanitary system. This project was originally limited to few area which are nearer to Madras and now it has been extended to the entire State. The functioning and performance of this centre is limited to evolve Low Cost technology to the rural population. They instal only a few units every year for demonstration and continued installation for all the house is not done.

Therefore practically the rural population benefitted by sanitary system is NIL and everything has to be started afresh. At the beginning of the decade programme 56,000 people have sanitation facilities in the rural areas.

6. SECTOR ORGANISATION

Capital Investment for water supply and sanitation sector is a part of the overall development plan in India. In Tamilnadu about half a dozen agencies are interested in the affairs of water supply and sanitation programme. They are:

- 1) Madras Metropolitan Water Supply and Sewerage Board
- 2) Tamil Nadu Water Supply and Drainage Board
- 3) Director of Municipal Administration
- 4) Director of Rural Development
- 5) Director of Adi Dravidar and Tribal Welfare
- 6) Tamil Nadu Housing Board
- 7) Director of Town Panchayats

The Institutional and Functional Responsibilities

- | | | |
|----|---|--|
| 1. | Madras Metropolitan Water Supply & Sewerage Board | Planning, programming, designing, constructing and operating and maintaining of water supply and sanitation system in Madras Metropolitan areas. |
| 2. | Tamil Nadu Water Supply and Drainage Board | Planning, programming, designing and constructing water supply and sanitation programme in all Tamil Nadu other than MM Area. |

- | | | |
|----|--|---|
| 3. | Directorate of Municipal Administration | Operation and maintenance of water supply and sanitation systems in Municipalities and Municipal Townships and construction of Minor works costing not more than a specified amount based on the grade of such towns. |
| 4. | Directorate of Rural Development | Operation and maintenance of water supply and sanitation system in Panchayat Township, Town Panchayats and Village Panchayats and construction of few minor works not exceeding a prefixed monetary limit. |
| 5. | Directorate of Adi Dravidar and Tribal Welfare | Planning, Programming, Designing and constructing water supply sources in Adi-Dravidar 4 Tribal colonies. |
| 6. | Tamil Nadu Housing Board | Planning, Programming, Designing and constructing water supply and sanitation facilities in Housing colonies constructed by the Board. |

In Tamil Nadu though there are nearly half dozen agencies to implement the programme on water supply and sanitation, the M Board and TWAD Board are solely responsible for planning and programming the total plan for the State.

Monitoring and surveillance of quality of the services are provided regularly by two organisations namely (1) King Institute, Guindy (2) Directorate of Public Health and Preventive Medicine. During the last 10 years TWAD Board has created necessary infrastructures to undertake the services of monitoring and surveillance of water quality.

7. DECADE PLAN TARGETS (POP. COVERAGE)

Targetted population to be served by 31.3.85 (Phase-I).

Urban Water Supply:

New	1723,000
Augmentation	4661,000
Rural Water Supply Scheme	6214,000
Urban Sanitation New	542,000
Extension	1014,000
Rural Sanitation	800,000

Targetted population to be served		during the 2nd phase
Urban Water Supply	New	4416,000
	Augmentation	5322,000
Rural Water Supply Scheme		20316,000
Urban Sanitation	New	6739,000
	Augmentation	1870,000
Rural Sanitation		7455,000

8. DECADE PROGRAMME FUNDING

Funds required during the Decade for implementing water supply and sanitation programme at 1980 price level are furnished below sub sector wise:

1) Urban Water Supply	Rs.383.5190 crores
2) Rural Water Supply	Rs.518.3900 crores
3) Urban Sanitation	Rs.262.4420 crores
4) Rural Sanitation	Rs. 41.2750 crores
Total	<u>Rs.1205.6260 crores</u>

Mobilisation of Resources: Funds available during the Sixth Five Year Plan is furnished below: Last 4 years of the Sixth Five Year Plan.

1) Urban Water Supply	Rs.123.5763 crores
2) Rural Water Supply	Rs.186.1696 crores
3) Urban Sanitation	Rs. 31.3378 crores
4) Rural Sanitation	Rs. 4.0000 crores
Total	<u>Rs.345.0837 crores</u>

Funds Required during the VII Five Year Plan.

1) Urban Water Supply	Rs.215.4767 crores
2) Rural Water Supply	Rs.280.7373 crores
3) Urban Sanitation	Rs.188.6704 crores
4) Rural Sanitation	Rs. 31.0250 crores
Total	<u>Rs.715.9094 crores</u>

Funds required during the First Year of the VIII Five Plan Period.

1) Urban Water Supply	Rs. 44.4660 crores
2) Rural Water Supply	Rs. 51.4831 crores
3) Urban Sanitation	Rs. 42.4338 crores
4) Rural Sanitation	Rs. 6.2500 crores
Total	<u>Rs.144.6329 crores</u>

At present the State shares maximum burden from its plan allocation and partly by the Government of India, Financing institutions like LIC and Donor agencies like DANIDA UNICEF etc., still the resources developed could not be sufficient. Hence the State and Central Government will work out the possibilities of setting up an independent financial institution and also tapping additional resources from bilateral and International Agencies.

9. SUPPORT PROGRAMMES

To meet the heavy demand within the shortest spare of this decade the existing administrative and executive personnel have to be suitably strengthened. For the present programme itself the availability of material is found to be a hot cake. For increased activities in the decade, material management have to be geared up to purchase and supply the required materials at the appropriate time and equally at economical cost.

The existing difficulties and delays in the land acquisition, project preparation, maintenance of accounts, auditing the accounts, co-ordination among different agencies policy formulation have to be complete. Operation and maintenance is not effective to derive the full benefit the system.

In Sectoral Co-ordination: Water Supply and Sanitation Sector Programme in Tamil Nadu is mainly implemented by the TWAD Board and M WSSB. The implementation of the projects will require the co-ordination of other departments like Industries, Health and Family Welfare, Tamil Nadu Electricity Board, Highways Public Works Department, Finance and Revenue.

In order to overcome the difficulties in the initia stage itself, few of the heads of departments are Madras Board of Directors in TWAD Board and MFWSSB so that the formulation of proposals and the decisions can be taken without any constraints. During implementation the coordination in respect of the following departments are also essential. Director of Municipal Administration, Director of Rural Development, Public Works Department, Highways Department etc..

Health Education and Community Participation: Water Supply and Sanitation is a service sector. The investment for this sector is recurring in nature. The duration and value of recurrence is mainly based on how the systems are utilised and maintained. For effective maintenance the public is to be educated about this sector services. The services rendered by the Health Department are advising on the aspects of effective disposal of waste water and water testing by the Industries when approached; facilities provided in respect of chlorination when public approaches etc.. but in respect of educating the rural mass about the importance of water supply is yet to be done.

The investment required to implement the programme is massive. The State or Central Government can contribute to provide the basic minimum with several constraints. So the public has to come forward and contribute a little either in the form of cash or service which will relieve the Government from the heavy burden to invest and maintain the system. Therefore community participation is also essential for this sector services.

TAMIL NADU

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

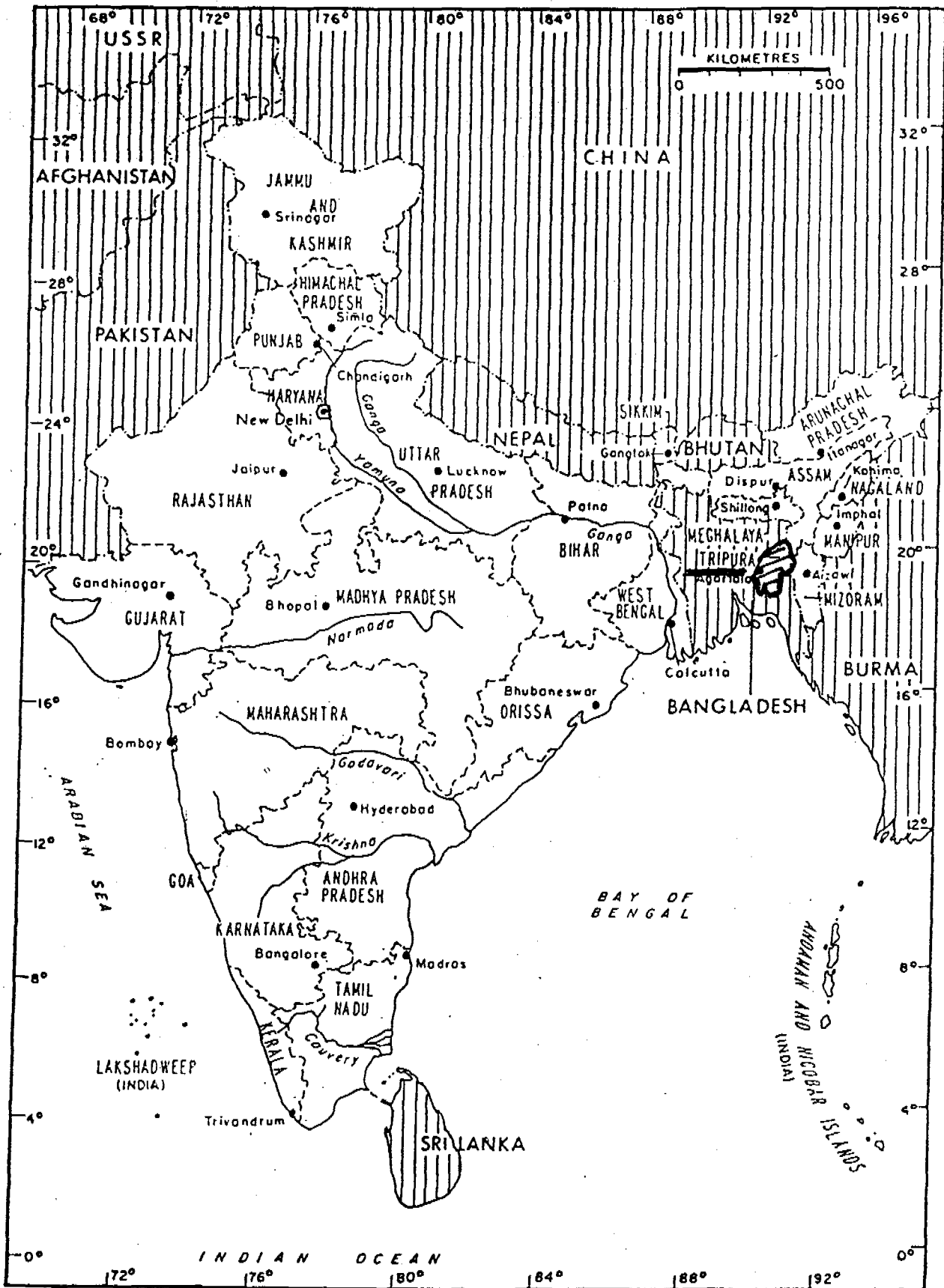
(Population and cost Rs. in thousand)

Year	Urban		Rural		
	Population to be covered		Population to be covered	Capital cost to be utilised	
	New	Aug			
1	2	3	4	5	
1981-82	212	765	132361	1506	316523
1982-83	468	1080	122294	1500	245173
1983-84	513	1338	533394	1490	600000
1984-85	530	1478	447714	1718	700000
1985-86	804	970	473224	3454	549091
1986-87	556	670	329837	4064	633820
1987-88	649	782	383902	3657	594820
1988-89	826	995	483902	3047	514821
1989-90	826	995	483902	3047	514821
1990-91	755	910	444660	3047	514831
Total	6139	9983	3835190	26530	5183900

SANITATION

1981-82	81	Nil	67256	-	-
1982-83	122	312	55364	-	-
1983-84	185	360	101777	400	15000
1984-85	154	342	88981	400	25000
1985-86	991	275	346012	1200	60250
1986-87	1125	312	385173	1251	62500
1987-88	1125	312	385173	1251	62500
1988-89	1125	312	385173	1251	62500
1989-90	1120	312	385173	1251	62500
1990-91	1253	348	424338	1251	62500
Total	7281	2884	2624420	8255	412750

STATE OF TRIPURA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
TRIPURA

1. INTRODUCTION

This State having an area of 10 477 sq. km. is land - locked and surrounded by Bangladesh border on 3 sides. This is also the second smallest State in area and the 5th smallest State in population among Indian States. In 1971 census population of this State was 1.55 million which is expected to be 2.75 million by the year 1991. The projected population figures as on March, 1981 is estimated to be 2.104 million. Regarding evolution of water supply and sanitation sector in this State and the development of service levels it may be mentioned here that due to geographical location of the State the development in this Sector was very slow comparing to rest of the country. Previously Tripura was a princely State which joined Indian Union after independence. Till 1959-60 nothing much could be done in this sector as the top most priority was given to develop the communication system within the State and also with the rest of the country by way of constructing permanent road net works.

The State Tripura falls in between latitude 24"-56'N to latitude 24"-32'N and longitude 91"-10'E to longitude 92"-21'E and surrounded on 3 sides by Bangladesh sharing 839 km of international boundary and is also bordered in the North-East and East by Assam & Mizoram sharing a boundary of 53 km and 109 km respectively. The total area of the State is 10 477 sq.km. being 0.3% of Indian Territory. The extreme length and width are 183.5 km and 112.7 km respectively. The State is divided administratively in 3 (three) Districts i.e., West, North & South and among them North District is mainly hilly. The West District comprising hills and plains is inhabited by 48.3% of States population. The State has extremely difficult Road-cum-rail communication system and the only road-cum-rail link with the rest of the country is from Dharmangar, 200 km. in the North East from the capital Agartala. The Capital Agartala is air-linked with West Bengal and Assam.

The climate of the State is generally warm and humid. The temperature ranges from 10°C in winter to 40°C in summer and the average annual rainfall is about 2100 mm. The climate is cold and dry during winter - December, January and February which is very pleasant. Topographically Tripura is a hilly terrain with 70% of its area as hills and 30% of its total area as plain. There are 5 Nos. main hilly ranges in the State running North-South and are parallel to each other. These ranges are Baramura, Atharamura, Longthorai, Sankhantang & Jampai covering a major part of West and North District.

5. PRESENT STATUS OF WATER SUPPLY AND SANITATION IN THE STATE

Rural

Water Supply: 24,113 number of villages and hamlets and such other habitations out of 48,550 Nos. have been covered with protected drinking water supply. Of the above, 1403 Nos. have been provided with piped water supply and 22,710 have been provided with borewells. As on 31.3.81, 31.3% of rural population have been provided with water supply facilities.

Sanitation: Only 2 Underground Drainage Schemes have been provided in the State.

Urban

(242 Urban areas except Bangalore Metropolitan area)

Water Supply: 241 Cities/Towns out of 242 areas in the State under the jurisdiction of Karnataka Urban Water Supply & Drainage Board have been provided with water supply covering a population of 99.86 percent of urban population. In most of the towns the per capita supply is very much lower than the standards and supply is intermitant.

Sanitation: So far only 17 towns have Sewerage system and 3 towns have proper sewage disposal system. However, sewerage works are in progress in 16 towns.

Bangalore Metropolitan Area

Water Supply: The Board is supplying to the tune of 95 litres per day per capita as against the norm of 200 litres per day per capita.

Sewerage System: 70% of the area of the city has underground Drainage System, and the Board has been able to render only primary treatment for the sewage.

Overall 37.87% of urban population of Karnataka have been provided with sanitation facilities.

6. SECTOR ORGANIZATION

The three Sector Institutions involved in the State are:

- | | | | |
|------|----------------|---|---|
| i) | Rural | - | The Public Health Engineering Department |
| ii) | Urban | - | Karnataka Urban Water Supply and Drainage Board |
| iii) | Bangalore city | - | Bangalore Water Supply and Sewerage Board. |

7. DECADE PROGRAMME TARGETS

Rural

Water Supply: The Water Supply facility will be provided to 25,393 villages covering a population of 209.45 lakhs (1991) either with piped water supply or with borewells and pumps.

Sanitation: 25% of the total estimated 1991 rural population, i.e., a population of 7236 thousands have to be provided with low cost water seal latrines in the rural areas.

Urban

(242 urban areas except Bangalore Metropolitan area)

Water Supply: All the 242 towns/cities with a targetted population of 94.47 lakhs as on 31.3.1991 will be provided with 100% water supply as per the standard level of supply prescribed by Government of India Manual. This requires launching of some new schemes for some towns and many augmentation, development and improvement schemes for all the towns.

Sanitation: All Class I Cities are to be provided with 100% sewerage and sewage treatment. 80% overall coverage of population for all the Class I Cities and Class II to VI towns with Sewerage and Low Cost Sanitation such as conversion of bucket latrines to pour flush latrines and public latrines with attendants.

Urban - Bangalore Metropolitan Area

Water Supply: It is proposed to complete the II Stage Comprehensive Water Supply Scheme by the end of June 1982. Then III Stage of the Scheme is proposed to be launched by 1982 to benefit a population of 27.16 lakhs as on 31.3.1991 and is targetted to be completed by 1986-87. Also it is proposed to start the IV Stage or any other alternative Scheme in 1987.

Sanitation: The II Stage of Cauvery Water Supply also envisages sewerage system to certain parts of the City, and proposed to be completed by 1982. It is proposed to provide secondary treatment to the sewage for the entire City by 1990. This Scheme is grouped in Stages, III Stage to be started in 1983 and to be completed by 1986 and the IV Stage to be started during 1987 and to be completed by 1990. In all 9730 thousands of urban population including Bangalore city will have sanitation facility by 31.3.1991.

8. DECADE PROGRAMME FUNDING

The financial requirements by the 3 Sector Institutions in the State are as under:

	<u>Water Supply</u>	<u>Sanitation</u> (Rupees in millions)	<u>Total</u>
Rural	2783.975	361.800	3145.775
Urban	2883.550	1780.585	4664.135
		Total	7809.910
			or Rs. 781 crores

For proper coordination, policy formulation, guidance and overview an Apex Committee at State Level has been formed with the Chief Minister as Chairman of the Committee. Similarly, the State Action Committee has been formed with Chief Secretary as its Chairman. A 'Working Group' has been formed with the Chief Engineer's of 3 Sector Institutions dealing on Water Supply and Sewerage.

An amount of Rs.132 crores under state sector and Rs.24.575 crores under central sector ARP programme have been provided during the 6th plan period.

The funds allocated for this sector in the VI Five Year Plan will not be sufficient to the amount needed to complete the targetted programme in the Decade. This aspect is to be considered even in the VII Five Year Plan allocations.

The State will be in requirement of Rs.781.00 Crores over a period of 10 years i.e. annual flow of Rs.70 to 80 Crores to this Sector.

Mobilisation of Resources

- i) The plan allocations to be increased to at least 6% during the seventh & eighth plans.
- ii) Fixing higher water rates to ensure repayment of laons with interest as well as recovery of operation and maintenance cost.
- iii) A minimum contribution of 10% to 25% of Capital cost from Urban local bodies, depending on their size and resources.
- iv) Instituting a special purpose cess on selected taxes to be exclusively utilised for Water Supply and Sanitation Sectors.
- v) A minimum contribution by the people/gram panchayats of 10% of the cost of Scheme in the rural sector.
- vi) The LIC is to be persuaded to earmark at least 10% of their investible funds for this Sector.

KARNATAKA

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION

DECADE, 1981-90

Annual Phasing of Decade Programme

WATER SUPPLY

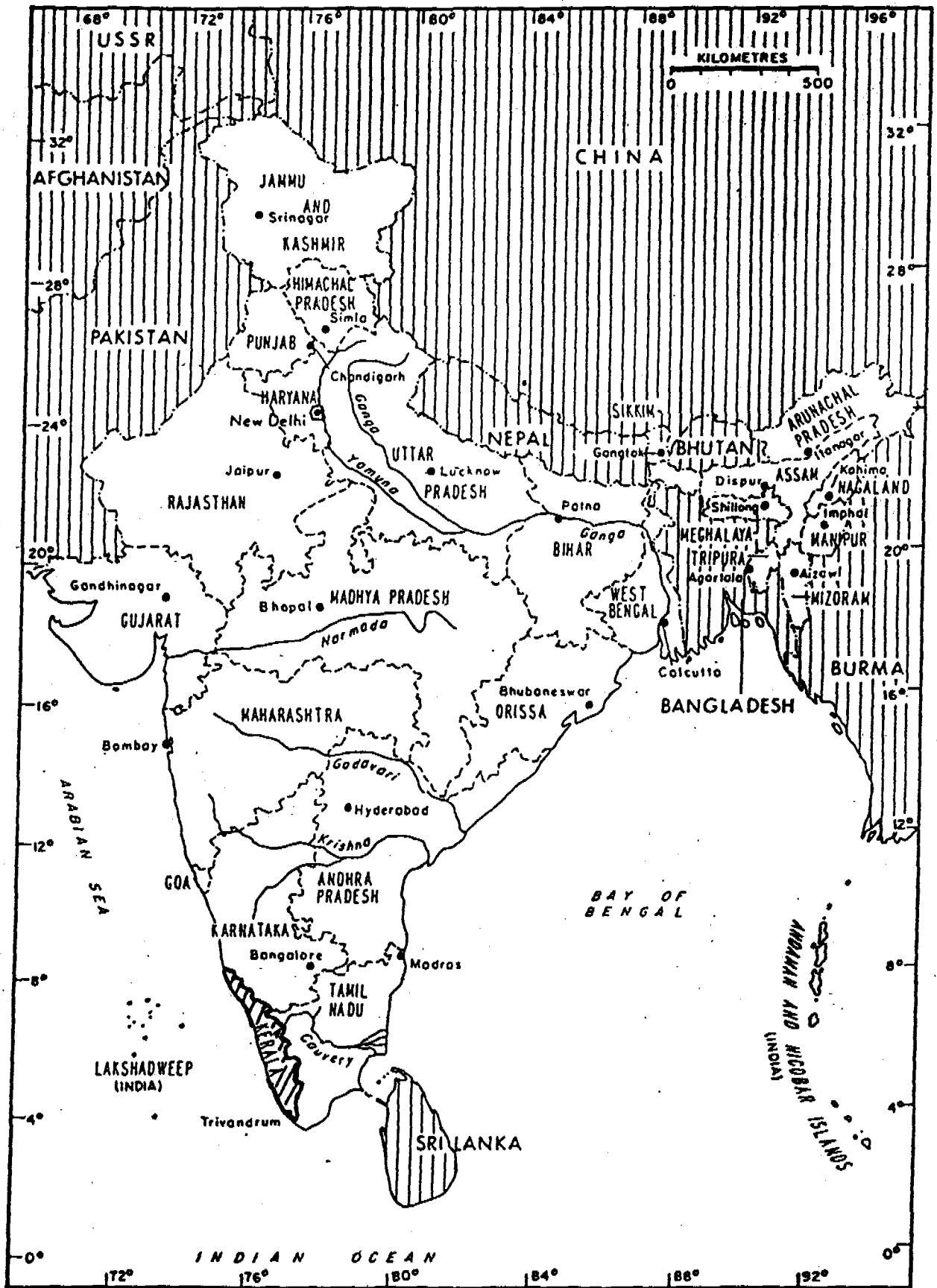
(Population & cost (Rs.) in thousands)

Year	URBAN		RURAL	
	Population to be covered including Augmentation	Capital cost to be utilised including Aug.	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	393	109 000	1 080	143 530
1982-83	325	91 400	1 148	152 510
1983-84	385	125 000	1 339	177 960
1984-85	392	129 100	1 355	180 120
1985-86	1 195	343 400	2 323	308 820
1986-87	1 620	450 800	2 888	383 870
1987-88	2 000	533 000	2 770	368 230
1988-89	1 894	392 250	2 686	357 040
1989-90	1 841	362 250	2 693	357 995
1990-91	1 921	347 350	2 663	353 900
Total	11 966	2 883 550	20 945	2 783 975

SANITATION

1981-82	144	27 000	-	-
1982-83	204	40 000	-	-
1983-84	109	20 000	-	-
1984-85	109	20 000	-	-
1985-86	1 157	219 800	816	40 800
1986-87	1 399	262 400	1 106	55 300
1987-88	1 572	290 200	1 452	72 600
1988-89	1 671	305 950	1 426	71 300
1989-90	1 647	300 950	1 223	61 400
1990-91	1 621	294 285	1 208	60 400
Total	9 633	1 780 585	7 236	361 800

STATE OF KERALA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
KERALA

1. INTRODUCTION

Most parts of Kerala State are in the grip of acute scarcity for drinking water especially during the summer months. In the coastal areas there is saline intrusion and the salinity travels up the rivers for long reaches making the availability of drinking water difficult especially in the coastal areas. In the midland areas the dug wells dry up in summer months and in upland areas, water is available only in gorges and valleys and the people especially the women folk have to walk great distances to bring water.

Kerala is geographically a narrow stretch of land lying on the South Western coast of India. The area of 38,864 km² is subdivided into three zones, the low lands or coastal plains, the midlands, and the uplands. The coast-line is about 580 km in length, while the width of the State varies from 11 to 121 km.

2. SOCIO-ECONOMIC INDICATORS

The State's population according to 1981 Census is 25,403,217 (project population figure being 25,960,200) with a density of 654 per sq. km. 18.05% of the population resides in the urban areas and the rest in the rural areas. The population as per 1991 projection will be 30374 thousands.

The per capita income in the State is Rs. 1056 against an all India average of Rs. 1316. The share of population considered to be living below the poverty line is 47%. The literacy rate in Kerala is the highest in the country namely 69.17% (1981 census).

3. HEALTH ASPECTS

The birth and death rates per thousand (1979) are 25.9 and 6.9 respectively. Disease statistics (1976) indicate the reported incidence of water borne diseases to be about 3.1 per 1000 population, the more prevalent being dysentery, hepatitis, typhoid and gastro enteritis.

4. WATER RESOURCES

There are two distinct rainfall seasons, the south west monsoon during June to August and North East Monsoon from September to November. During these two seasons, 90% of its average annual rainfall of 2615 mm is precipitated. The 41 east flowing rivers of Kerala form the major surface water sources for drinking water supply projects. Because of the laterite and rocky formations of soil, ground water is generally available in deeper fracture zones except in some of the coastal regions of Kerala.

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

Kerala is divided into local self-governing communities such as panchayats, townships, municipalities and corporations, the last three constituting the urban areas. There are 1010 panchayats, 2 townships, 42 municipalities and 3 corporations which account for 84%, 6%, 4% and 6% of the State's total population of 25.96 million (1981 projected) respectively. Presently, 61% of the total urban population residing in the 3 Corporations, 35 out of the 42 municipalities and two townships, are covered by water supply facilities. As against this, only 28.41% of the rural population gets protected water supply.

The coverage in the case of sanitation is very much lower. Only two cities have sewerage facilities and that too partially. Only about 30% of the population of the city of Trivandrum and 3% of that of Cochin have sewerage facilities. Work on sewerage system for two more cities has begun only recently. Thus only 6.4% of urban population is covered by sanitation facilities. In the case of the rural population the coverage is less than 1%.

The Service Coverage for water supply and sanitation as on 31.3.1981 are as under:

<u>Service</u>	<u>Population</u> (in thousands)	<u>Percentage</u>
<u>Urban Water Supply</u>	2847	
By house connection	800	28%
By stand post	2047	72%
<u>Rural Water Supply</u>	6046	
By house connection	120	2%
By stand post	5926	98%

As regards sanitation, 3 lakhs population has been provided with sewerage facilities in urban areas and 0.99 lakhs with sanitary latrines in rural areas.

6. SECTOR ORGANIZATION

The Public Health Engineering Department of Kerala which was formed in 1956 under the national water supply sanitation programme is one of the major departments under Government of Kerala. It plans, designs and constructs water supply schemes in urban and rural areas and also sewerage schemes in urban areas. The generation and transmission for all the water supply schemes are being maintained by the Public Health Engineering Department. Excepting in a few municipalities the maintenance of distribution system is with the PHED. The Public Health Engineering Department has constructed so far - 33 major water supply schemes and also about 800 rural schemes. Among the various schemes under execution now, Peppara Dam (for augmenting the water supply in the Capital city of Trivandrum) costing about Rs. 12 crores is one of the major works.

7. THE DECADE PLAN AND TARGET

In terms of gross population to be provided with water supply and sanitation, the State targets for the Decade are shown as under:

Population in thousands

Item	Water Supply			Sanitation		
	Urban	Rural	Sub Total	Urban	Rural	Sub Total
1. Population served as on 31.3.1981	2,847	6,046	8,893	300	99	399
2. Projected population for 1985.	3,110	8,510	1,162	450	140	590
3. Projected population for 1991	6,063	24,311	30,374	6,063	24,311	30,374
4. Decade Targets (In percentage of population to be covered)	100%	100%	-	80%	25%	-
5. Total population to be served as on 31.3.1991 as per Decade targets	6,063	24,311	30,374	4,850	6,078	10,928
6. Population to be served by new systems.	3,216	18,265	21,481	4,500	5,979	10,529

Achieving the targets for urban water supply, rural water supply and urban sanitation will be the sole responsibility of the Public Health Engineering Department, where as that for rural sanitation will be the joint responsibility of Public Health Engineering Department and Community Development Department.

8. DECADE PROGRAMME FUNDING

For providing water supply and sanitation to the remaining population during the Decade, it has been estimated that an investment of approximately Rs. 561.49 crores would be necessary.

The following table shows a detailed picture of the requirements of funds under each sector for covering the population as per the decade targets and funds available in the Vith Plan for the Decade.

Rs. in crores

	<u>Water Supply</u>		<u>Sanitation</u>		<u>Total</u>
	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>	
Funds required for achieving the Decade programme	107.07	268.89	155.63	29.90	561.49
Funds available from the VI Plan (4 years)	21.69	67.14	9.42	1.60	99.85
Balance required	85.38	201.75	146.21	28.30	461.64

Out of the total Vith Plan provision of Rs. 1550.40 crores of the State, Water Supply and Sanitation Sector gets only Rs. 90.50 crores which is 5.80%. Thus out of 561.49 crores required to achieve the Decade programme we have only about 99.85 crores (including ARP allocation from Central Government) in Vith Plan for the Decade (4 years). This is only 18% of the total requirements. Unless additional funds are made available immediately it will be almost impossible for the State to achieve the Decade targets.

Mobilisation of Resources

Out of the total requirement of Rs. 561.49 crores, only Rs. 99.85 crores are available in the Vith Plan for the Decade programme leaving Rs. 461.64 crores to be tapped from other sources. The following steps are suggested:

(i) 7th & 8th Plans

The working group has recommended that a minimum of 6% of the 7th & 8th Plan provision may be set apart for water supply sector.

(ii) Internal resources

All possible steps are to be taken to step up the contribution by the local bodies and also possible revenues for utilisation in the execution of the projects.

(iii) L.I.C. loan

Even though L.I.C. is giving loans for water supply and sanitation schemes for the State, the amount so far procured is not appreciable compared to the enormous deficit in the funds required for implementing the Decade programme. The L.I.C. should be persuaded to earmark at least 10% of their investible funds for the water supply & sanitation programme in comparison to the current amount of 8%.

(iv) External Aid

The Government has posed the following water supply schemes for External Assistance.

A.	<u>Bilateral Assistance</u>	<u>No. of schemes</u>	<u>Cost</u> <u>Rs. in crores</u>
	Already secured from Netherlands Government.	2	10.16
	Under consideration by the Netherlands Government	6	30.00
	Under consideration by the DANIDA	3	12.00
	Total		<u>52.16</u>
B.	World Bank Assistance under consideration	9	<u>57.50</u>

70% of the cost of schemes sanctioned for Bilateral Assistance and 35% of the cost of World Bank schemes will be an additionality to the plan provision.

In spite of all the above sources, it has been roughly assessed that at least another Rs. 125 crores will have to be found for completing the Decade programme. More schemes in the needy areas of coastal villages are being posed for Bilateral Assistance urgently. Moreover schemes for the second phase of World Bank Assistance are also being posed. Prompt action has to be taken to approach the donor countries for their aid. All other possible sources will have to be explored for making up the deficit.

International Drinking Water Supply & Sanitation Decade, 1981-90

ANNUAL PHASING OF DECADE PROGRAMME

(Population & Cost (Rs.) in thousands)

A. WATER SUPPLY

YEAR	URBAN		RURAL	
	Popln. to be covered	Capital cost to be utilised	Popln. to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	30	86281	375	113856
1982-83	65	63200	280	140605
1983-84	70	33731	330	208473
1984-85	100	<u>33732</u>	1550	<u>208473</u>
Total for 4 years		216944		671407
1985-86	300	120000	2000	264540
1986-87	450	150000	2500	350000
1987-88	500	150000	2500	350000
1988-89	600	150000	3000	367827
1989-90	600	161356	3000	367826
1990-91	501	<u>122425</u>	2730	<u>317300</u>
Total for 6 years		853781		2017493
Grand Total:	3216	1070725	18265	2688900
B. SANITATION				
1981-82	10	18383	18	1990
1982-83	20	19000	5	667
1983-84	20	28399	27	6200
1984-85	100	<u>28399</u>	30	<u>7170</u>
Total for 4 years		94181		16027
1985-86	450	154819	600	30000
1986-87	700	200000	900	45000
1987-88	800	250000	1200	53600
1988-89	900	300000	1200	53600
1989-90	800	300000	1000	50773
1990-91	750	<u>257330</u>	999	<u>49950</u>
Total for 6 years		1462149		280950
Grand Total:	4550	1556330	5979	298950

EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
MADHYA PRADESH

1. INTRODUCTION

The State of Madhya Pradesh located in the centre of the country is the largest, having an area of 442841 sq.km. It is located between 18° and 26¹/₂° north latitude and 74° and 84¹/₂° east longitude. The tropic of cancer passes through the northern part of the State. It came into being on 1.11.1956 by an amalgamation of erst-while States of Madhya Bharat, Bhopal, Vindhya Pradesh and old Madhya Pradesh (excluding Vidharbha) as a result of States Reorganization.

The current pattern of running and maintenance of Urban and Rural Water Supply schemes is a mixed one. 30 urban water works are being maintained by the PHE Department and the remaining urban water works are being maintained by local bodies. PHED is also maintaining all the Rural Water Supply Schemes based on tube well with handpumps. The piped water supply schemes in rural area are looked after by local Gram Panchayats but repairs of pumps and machineries will be done by the Department as per recent orders of the State Government.

2. SOCIO-ECONOMIC INDICATORS

The population of Madhya Pradesh was 4,15,66,000 as per 1971 census. As per 1981 census it is 5,21,31,000. The projected populations of 1981 and 1991 as estimated by the Registrar General of India have been taken into account for preparation of Master Plan and the same are 5,30,49,000 and 6,61,24,000 respectively.

The percentage of population in urban and rural area is 20.31% and 79.69% respectively as per 1981 census and the percentage for projected population for the year 1991 has been worked out as 20.8% and 79.2% respectively. The density of population is 94 persons per sq.km. There are 303 towns and 70883 villages in Madhya Pradesh.

Average per capita income is Rs. 828 per annum, which is one of the lowest in the country. 57.7% of the people live below the poverty line.

The average rate of literacy in the State is 27.82% (1981 census). 39.38% for males and 15.54% for females.

About 23.7% of the population are Scheduled Tribes and 13.8% Scheduled Castes. The State is backward, economically and socially.

3. HEALTH ASPECTS

The average life expectancy in the State is estimated to be 57.3 years for males and 56.0 years for females. The crude annual death rate is 15.1 per 1000 population and infant mortality rate is estimated to be 143 per 1000, the second highest in the country. 60% to 70% of the diseases occurring in rural areas are attributed to lack of safe drinking water and absence of sanitary methods of excreta disposal. Details of water and foecal borne diseases with number of deaths for the period 1977-79 is given in the following table:-

Year	Guinea Worm		Infective Hepatitis		Dysentery	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
1977	1666	14	16945	136	830344	304
1978	3167	13	24298	192	1075382	340
1979	5734	28	33758	368	1110838	350

4. WATER RESOURCES

Generally speaking, Madhya Pradesh has good rainfall and so there is no water scarcity. The State is divided into seven river basins. The geographical areas, range of average rainfall, range of infiltration index, gross recharge, net recharge, existing draft and balance of ground water available for development are given below:

River Basin	Geographical area (sq.km)	Range of average annual rainfall (mm)	Range of infiltration index (%)	Gross recharge (MAF)	Net recoverable recharge (MAF)	Draft in 1977 (MAF)	Balance available for exploitation (MAF)
Yamuna	139128	625-1431	15-20	18.00	12.57	2.27	10.30
Ganga	60373	1050-1727	15-20	10.46	7.38	0.40	6.98
Mahanadi	77753	1190-1788	15-20	13.46	9.40	0.49	8.91
Godawari	62811	914-1824	15	10.86	7.62	0.32	7.30
Narmada	86256	636-2123	15-20	13.21	9.24	1.14	8.10
Tapti	9886	636-1193	15-20	1.22	0.89	0.16	0.73
Mahi	6961	696-945	15	0.73	0.49	0.08	0.41
	443168	625-2123	15-20	67.94	47.59	4.86	42.73

The gross recharge in all the river basins of Madhya Pradesh is of the order of 67.94 MAF/Year. The present rate of ground water exploitation in all the river basins (based on the figure for year 1977) is of the order of 4.86 MAF/Year. Thus a balance of 42.73 MAF of exploitable ground water is available for future development as the recoverable net recharge is worked out at 47.59 MAF/Year.

5. STATUS OF WATER SUPPLY AND SANITATION AS ON 31.3.1981

Water Supply Coverage (Urban)

There are 303 urban towns out of which 186 towns had been covered with water supply facilities, benefitting a population of 70.94 lacs. Now as on 31.3.81 protected water supply systems have been extended to 230 towns benefitting 72.3% of the urban population.

Water Supply Coverage (Rural)

There are 70,883 villages in Madhya Pradesh out of which 27,238 problem villages and 195 non-problem villages had been provided with protected water supply upto 31.3.1981, covering rural population of 130.36 lacs. About 38,000 hand pumps have been installed on tube wells in problem villages upto 31.3.81. 30.4% rural population has benefitted from water supply facilities.

Under the K.F.W. Programme aided by the Government of Germany, 1,625 villages will be provided with protected water supply systems, in 3 phases at a cost of Rs. 60 crores upto June 1985. 483 villages have been taken up in Phase-I costing Rs. 19.07 crores. Agreement to this effect has been executed with the Government of Germany in December 1981.

Sanitation Coverage (Urban)

12 towns have been partially covered with sanitation (partly sewerage) facilities, benefitting a population of 5.38 lacs upto 31.3.1983. The work of sanitation in 3 towns has been taken up in Raipur, Bilaspur and Bhopal (augmentation).

Sanitation Coverage (Rural)

No significant work has been done so far in Rural Sanitation Sector.

6. SECTOR ORGANISATION

The Public Health Engineering Department is responsible for execution of all urban and rural water supply and sanitation schemes in the State. However, the current system of operation and maintenance is a mixed one, some water supply schemes are maintained by local municipal bodies and several by

the PHED. Rural piped-water supply schemes are maintained by Gram Panchayats. The maintenance of hand pumps is entirely with the PHED.

The State is divided into two zones, each under the charge of a Chief Engineer, the head of the organisation being the Engineer-in-Chief. They are supported by adequate field staff.

7. DECADE PLAN & TARGETS

For the Decade programme, the physical targets fixed for the country have been adopted for Madhya Pradesh. The following table indicates the physical and financial targets fixed under the Decade Programme for the State:-

SN	Item	W.S.S.			Sanitation Facilities		
		Urban	Rural	Total	Urban	Rural	Total
(POPULATION IN THOUSANDS)							
1.	Population covered upto 31.3.1981	7,094	13,036	20,310	538	-	538
2.	Population to be covered during the Decade upto 31.3.1991	6,666	39,328	45,994	10,470	13,091	23,561
3.	Total population to be covered by 31.3.1991	13,760	52,364	66,124	11,008	13,091	24,099
4.	Total population projected for 1991.	13,760	52,364	66,124	13,760	52,364	66,124
5.	Percentage coverage	100	100	100	80	25	36.46
6.	Funds required upto 31.3.1991 at 1981 price level (in lakhs)	17164.05	52560.10	69724.15	28748.55	6545.5	35294.05

Total funds required = 1,05,018.20 lakhs
= 1,050.182 crores

8. DECADE PROGRAMME FUNDING

In the VIth Plan there is a provision of only Rs. 191.32 crores including Rs. 44.82 crores in the Central Sector. During the first year of the plan which ended before the beginning of Decade Programme i.e. 1980-81. Rs. 49.69 crores were spent and we are left with only Rs. 141.63 crores for Phase-I of the Decade Plan.

Looking to this meagre provision in the VIth Plan, a large amount will be required in VIIth Plan period amounting to Rs.822.082 crores and in the first year of the VIIth Plan, Rs. 86.47 crores. This will require a large mobilisation effort. The village community and urban population should be involved in the implementation as well as in operation and maintenance of the schemes. In this way some people's participation in the shape of labour, money or materials, may be taken.

Maximum utilization of internal aiding agencies like HUDCO, LIC or Social Organizations will be done.

External aiding agencies like KFW, DANIDA, SIDA, JAPAN, UNICEF and WORLD BANK will also be approached for giving aid.

9. SUPPORT PROGRAMMES

Operation and Maintenance

The State is facing great difficulty in operation and maintenance of Urban and Rural Water Supply Schemes. Budgetary support from non-plan sources is inadequate. Local bodies have to raise adequate resources for operation and maintenance. Gram Panchayats should similarly take up maintenance by raising revenues.

Higher delegation to lower administrative levels should be done to ensure quicker decisions.

It is proposed to have some refresher and training courses in technical institutions like Polytechnics and Industrial Training Institutes for the staff required in operation and maintenance of Water Supply and Sanitation Schemes.

There is generally shortage of certain essential materials, like pipes, specially C.I. Pipes, cement, steel, quality hand pumps (India Mark II). These will have to be arranged as per requirements of the Decade programme alongwith railway wagons and road transport.

Intersectoral coordination

Coordination has to be ensured with other Departments which are also doing some development works in rural areas under Rural Development Programmes. Government have already taken a decision that whenever any irrigation project is prepared, a provision for the requirement of drinking water should also be made with the consultation of Public Health Engineering Department.

Health Education and Community Participation

Health education will be done by means of cinema shows, slide projectors, hand bills and posters, etc. so that people will know the importance of protected water supply. The motivation of the community is also necessary so that the community is involved from planning stage to maintenance stage. Peoples' participation will also be encouraged during Decade Plan.

Control & Monitoring of Decade Programme

Monitoring Cell has already been opened in the Head Office of the PHED and one Superintending Engineer has been made incharge of this Cell. This Cell will control and keep watch on the Decade Programme. Apart from this, high level committees have been formed. Decade Committee has been formed with Chief Minister of the State as the Chairman. Apex Committee has also been formed at State level for controlling the Decade programme.

MADHYA PRADESH

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

(Population and cost Rs. in thousand)

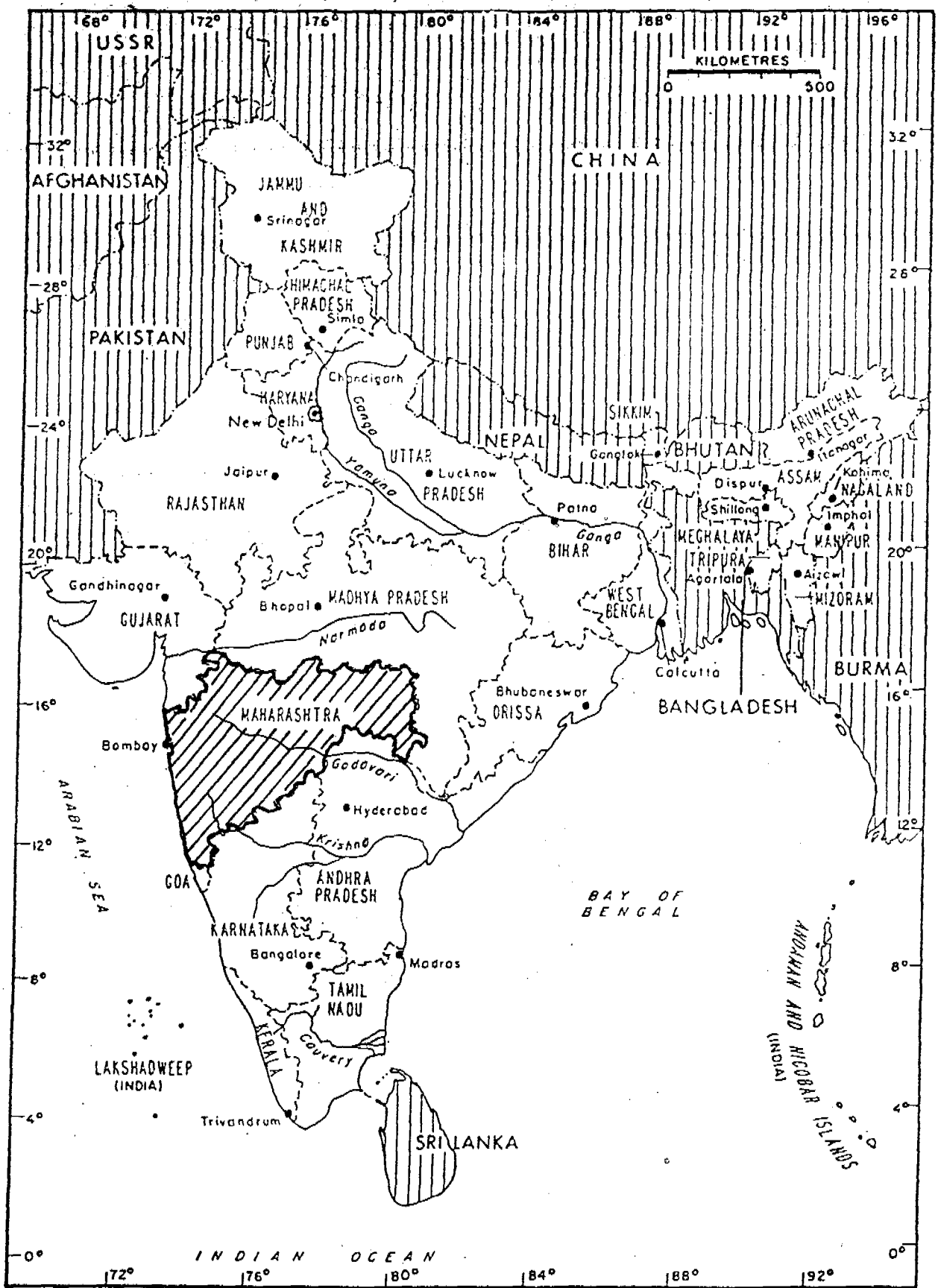
Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	150	64353	1425	330211
1982-83	223	125893	1646	362535
1983-84	284	122300	1649	347000
1984-85	1300	8056	1431	28300
1985-86	330	240195	5530	732797
1986-87	442	217251	5530	679331
1987-88	606	227251	6918	864223
1988-89	827	247251	8292	1048915
1989-90	1056	257250	4148	494539
1990-91	1448	206605	2759	368259
Total	6666	1716405	39328	5256010

SANITATION

1981-82	Nil	8357	-	-
1982-83	Nil	6110	-	-
1983-84	Nil	5700	30	1475
1984-85	310	5000	20	1007
1985-86	Nil	476132	2248	112415
1986-87	4616	476132	2169	108472
1987-88	Nil	592173	2694	134713
1988-89	1999	708215	3229	161455
1989-90	Nil	360092	1642	82130
1990-91	3445	296944	1059	52883
Total	10470	2874855	13091	654550

Worked out as per the actual allotment made upto 1983-84.
From 1984-85 onwards figures have been adjusted proportionately keeping the total as that of the figures originally proposed in the master plan.

STATE OF MAHARASHTRA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
MAHARASHTRA

1. INTRODUCTION

Maharashtra State is the third largest State in India having an area of 0.3 m. sq. kms. The State is having a coast line of 720 kms. along its western border with Arabian sea. The State has the East-West spread of 800 kms. and North-South spread of about 700 kms.

The maximum rainfall in the State varies from 2500 mm to 4000 mm. The average rainfall in the State is 1100 mm. The major portion (about 80%) of the State is occupied by basalt or Deccan trap. The State has 1970.2 million hectares of gross cropped area. The fertility of soil is generally poor. This is coupled with low percentage of area under Irrigation (12.2% in 1978-79 and 12.7% in 1979-80). Therefore, the yield of most of the crops grown is below the national average.

2. SOCIO-ECONOMIC INDICATORS

The population figures of the State are as under:

Census Year	Population in Million		
	1971	1981(Projected)	1991 (Projected)
Rural	34.63	39.78	44.35
Urban	15.68	21.04	27.48

While calculating the projected population for 1991 the Growth Rate is assumed as 1.191% per annum for Rural Population and 2.77% per annum for Urban population.

The 1981 Census results show that 65.4% of the State's population lives in the rural areas, as against 68.83% in 1971. This means that the proportion of urban population has gone up from 31.17% in 1971 to 34.59% in 1981.

The absolute population of three million-plus cities/urban agglomerations in the State is given below:

1981 population of three major urban / agglomerations in Maharashtra

Name of City/Urban Agglomeration	POPULATION IN 1981 (PROVISIONAL - MILLION)		
	Persons	Males	Females
1. Greater Bombay City (Municipal Corporation)	8.227	4.641	3.586
2. Pune City urban Agglomeration	1.685	0.896	0.789
3. Nagpur City Urban Agglomeration	1.298	0.679	0.619
TOTAL:	11.210	6.216	4.994

This means that 51.03% of the total urban population in the State is concentrated in these three major urban centres as against 51.15% and 49.99% in 1971 and 1961 respectively.

The per capita state income at current prices stood at Rs. 1903 in 1980-81 compared with Rs. 1694 in 1978-79, registering an increase of 12.3% over the latter year. The higher per capita state income is mainly accounted for by the prominence of the Organised manufacturing activity in Maharashtra. Though the population of the state is only 9% of the country's population, the state shares about 25% of the Income generated in the organised manufacturing activity in the country.

In 1981, the percentage of literates to the total population has gone upto 47.02 as against 39.18 in 1971 (Males 58.65%; Females 34.64%)

The literacy rate in Rural areas is much lower (37.97%) compared to the rate in Urban areas (63.82%).

3. HEALTH ASPECTS

The life expectancy in the State has increased from 51 years in 1966 to about 58 years in 1979 as against the All India figure of 52.1. The birth rate in the State was 28.70 per 1000 population and death rate due to all causes was 9.60 per 1000 population in the year 1980.

The incidence of water borne diseases is given in the following table:-

	<u>Cholera</u>	<u>Gastro-Enteritis</u>	<u>Infective Hepatitis</u>	<u>Guinea worm</u>
1978	1674	16,174	43,087	N.A.
1979	3711	26,505	40,465	1951
1980	1758	18,580	34,865	2737

The infant mortality rate in the State has fallen from 100 per 1000 live births in 1966 to 81 in 1980.

4. WATER RESOURCES

The total surface water potential of the State at 95% dependability works out to about 67.77 TMC. The total supply requirement of domestic and non-domestic, including industrial, uses for the State has been estimated at 8.08 TMC for the projected population in 2011.

As per the 3rd Assessment of Ground Water Potential in the State carried out by the Ground Water Survey and Development Agency, the Net Ground Water Recharge in the State is about 1 TMcum. Out of this 0.2 T Mcum is withdrawn and 0.8 T Mcum is in balance. From this balance quantity of Ground Water Potential, it is anticipated that 1851920 Nos. of irrigation Wells are feasible.

On the question of Ground Water Potential, opinions differ. Although the Ground Water Potential indicated as above appears to be encouraging, the experience on the basis of tube wells drilled under rural drinking water supply programme shows that out of 26427 wells drilled the successful tube wells are reported to be of the order 15787 (supply more than 1000 lph). The percentage of successful wells works out to be around 64.5 only. Therefore, a more critical examination of Ground Water Source would be necessary from time to time.

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

Urban Water Supply: There are 225 municipal towns in Maharashtra State with 1981 projected population of 21.04 millions. Out of these, nine

towns have municipal corporations, while the rest 216 towns have municipal councils of different grades to look after the civic affairs. All the nine corporations and 200 Municipal Councils (out of 216) had piped water supply schemes as on 31st March 1981. The average rate of water supply was observed to be 135 litres per capita per day. Population served, as on 31st March 1981, is 20.87 millions and thus the coverage of urban drinking water facility is 99.19%.

During the Decade an additional population of 6.614 million would be covered by new schemes under this sector. In addition 10.90 million would be covered by augmentation schemes.

Rural Water Supply: The details of villages in Maharashtra State and their water supply position as on 31st March 1981 is as under:

	Total No. of inhabited villages	Population (lacs)	No. of Problem/Difficult Villages				Total Difficult Villages	
			G.O.I. norms		G.O.M. norms		No.	Pop. (lacs)
			No.	Pop.	No.	Pop.		
1971 (Census)	32926	346.32	14025	167.56	4177	42.54	18202	216.10
1981 (Projected)	"	397.83						
Covered upto 31.3.1981	3926	76.34 (19.19%)					1090	9.9
To be covered as on 31.3.1991	29000	321.49	12935	157.66	4177	48.54	17112	206.20
1990 (projected population to be covered)	32926	367.14						

The physical target for rural water supply is 100% coverage of rural population (7.634 +32.149 +4.565) = 44.340 millions.

Urban Sanitation: Out of 225 municipal towns in Maharashtra State, only 14 towns have full/partial facilities of sanitation as on 31st March 81. Schemes are in progress in other 6 towns. The population served as on 31st March 1981 with sanitation facilities was 8.414 million and the percentage of population coverage is about 40%.

The physical target for the new and augmentation sanitation schemes is as under:

- a) New Schemes - Urban sanitation for 137 towns is proposed to be taken up during the Decade programme having a population of 13.572 millions.
- b) Augmentation Schemes - 90% of benefitted population (projected 1981) as on 31st March 1981 i.e. 7.573 millions.

Rural Sanitation: None of the villages is provided with adequate sanitation facilities as on 31st March 1981.

The physical target for rural sanitation is 25% of the projected 1990 rural population i.e. 11.087 millions. In villages only low cost water seal latrines will be constructed.

6. SECTOR ORGANISATION

At the State level, the work under the sector is controlled jointly by the Urban Development and Rural Development Departments with the assistance of the Departments of Planning and Finance. The following agencies are entrusted with the implementation of this programme in the field:

- a) Urban: (Under the control of Urban Development Department) Maharashtra Water Supply and Sewerage Board.
- b) Rural:
 - (i) Ground Water Survey and Development Agency
 - (ii) Zilla Parishads, Panchayat Samities and Village Panchayats.

Each one of these agencies have organisation to deal with the works entrusted to it.

7. DECADE TARGET POPULATION COVERAGE

Urban Water Supply:

(a) New: The population to be covered for new Schemes during the Decade is 6.614 millions.

(b) Augmentation: The population proposed to be covered for Augmentation Schemes during the Decade is 10.9 millions. The coverage is 50% of benefitted population. The details are as under:

5 Corporation	-	7.7 Millions
20 A Class Towns	-	2.0 Millions
34 B Class Towns	-	1.0 Millions
33 C Class Towns	-	0.2 Millions
<hr/>		
92	TOTAL	10.9 Millions
<hr/>		

Rural Water Supply:

The villages proposed to be covered during the Decade are 31852 having a total population of 36.714 Millions in 25 district. The priorities would be observed as described elsewhere in the report.

Urban Sanitation:

New: The Urban Sanitation that will be covered during the Decade will be as under:

Sewerage Schemes: 29 Towns having population of 11.48 Millions will be provided with Sewerage and Sewage Treatment facilities. The remaining 108 towns having a population of 2.092 Millions will be provided with low cost Sanitation facilities.

Augmentation Schemes: Augmentation Schemes of sanitation will be provided for each town having a population more than 0.1 Million and this will be provided for 25 towns having a population of 7.573 Millions.

Rural Sanitation:

Low cost sanitation facilities will be provided to 16137 villages having a population of 11.087 Millions.

8. DECADE PROGRAMME FUNDING

An estimation (at 1980-81 cost) of the requirements of funds, during the Decade for achieving the desired target has been made as under:-

a. Urban Water Supply	Rs. 3856 Millions
b. Urban Sanitation	Rs. 5565 Millions
c. Rural Water Supply	Rs. 6327 Millions
d. Rural Sanitation	Rs. 554 Millions

Total: Rs. 16302 Millions

Financial Resources: Financial resources for implementation of the Sector plans come partly (90%) from the plan provisions of the State in the successive Five Year Plans and partly (about 10%) from public contributions. Soft loan facilities outside plan assistance have been suggested to make up for deficiency, if any in the plan provisions to meet the Decade Programme.

The Unit costs suggested by the CPHEEO New Delhi have been adopted to calculate the total cost of the Decade Master Plan. The Projects will be designed as per Water Supply Manual of Government of India. The Schemes are generally designed for 30 years period.

9. SUPPORT PROGRAMMES

A Working Group consisting of the representatives of the implementing agency and Government is being set up by the State Government for Planning, preparation of feasibility reports, and implementation of the programmes connected with the Decade Programme. Present organisational set up would be examined by this working group and strengthened whenever found necessary. Assistance of outside agencies such as consultants has also been suggested for expediting pace of preparation of shelf of projects.

Material, Equipment and Store Purchase: The requirement of materials and equipments for Decade Plan have been tentatively worked out. Central allocation for key materials such as cement and steel has been suggested. Rate contracts based on delivery of specific quantity in specific period are suggested to be fixed up at Government of India level.

Land Acquisition: Strengthening of organisation for initiating Land acquisition proceedings has been suggested. Stress is also given on private negotiations for taking quick possession of land for construction works. Liberalisation of powers for release of forest land for sector use is recommended.

Manpower Development Training: The manpower required from year to year during the Decade programme has been worked out. Additional inputs in the Engineering Colleges for graduate student turnover have been suggested. Also about 1 year intensive University course for non-graduates and training for employees at grass root level has been suggested.

For the general policy guidance and coordination of the activities of the Decade programme, Committees are set up by State Government, one each at Minister's level and at Secretary's level. These Committees would meet as required to review the progress of Decade programme in the State and to give appropriate guidance to implementing agency.

Monitoring Control and Evaluation: For monitoring, control and evaluation of Projects, a Monitoring Cell is already created by Maharashtra Water Supply and Sewerage Board.

Information System: The Maharashtra Water Supply and Sewerage Board has already opened 4 Investigation Units, one Monitoring Cell and 7 Project Divisions to collect information on progress of planning and implementation of Urban and Rural Water Supply and Sewerage Schemes in the State.

MAHARASHTRA

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1081-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

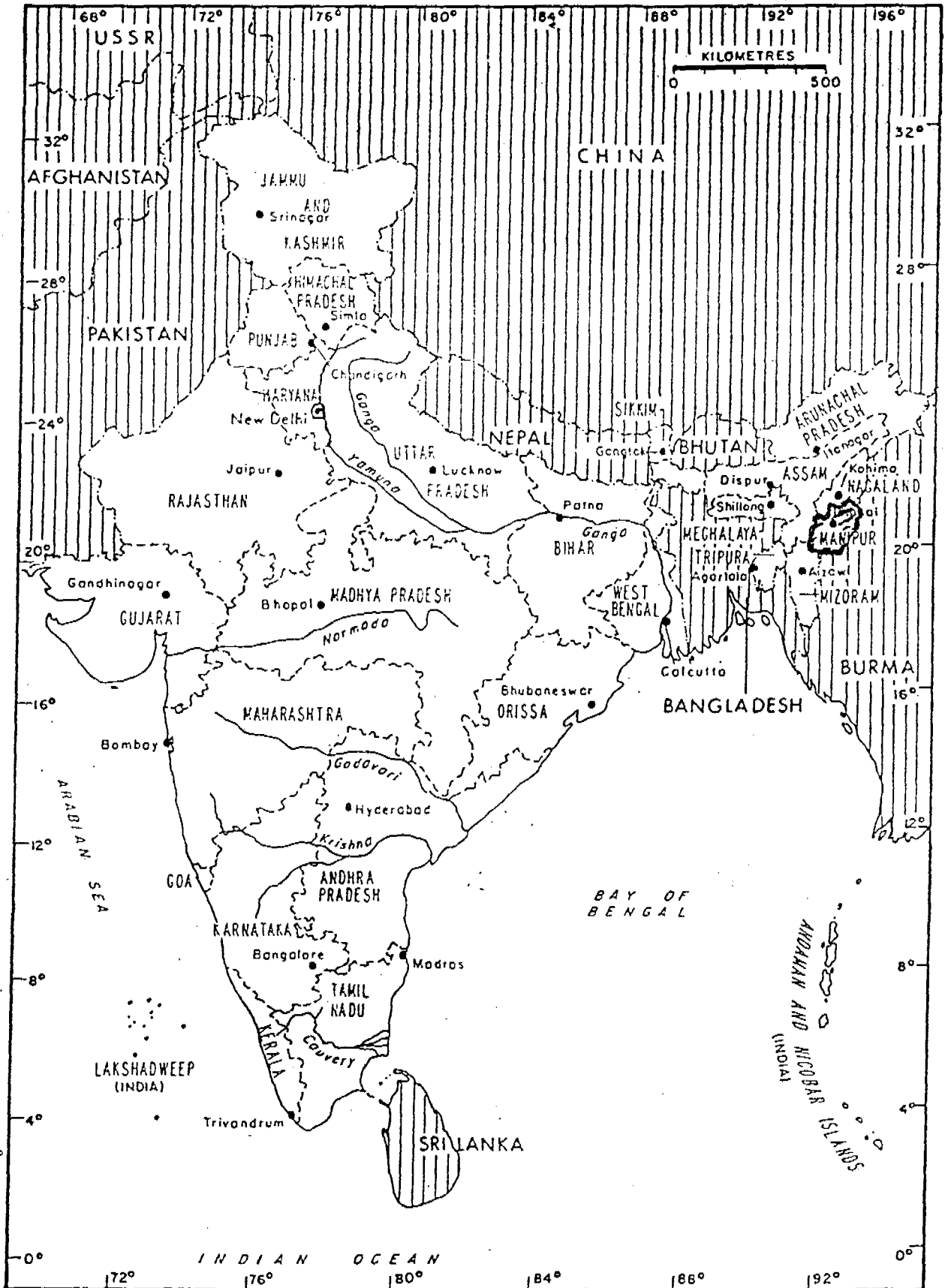
(Population and cost Rs. in thousand)

Year	URBAN		RURAL	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1980-81	-	386500	-	330000 ARP + 60000
1981-82	1700	629000	2500	350000 + 61100
1982-83	1700	610000	2500	450000 + 49600
1983-84	1700	691500	2500	640000 + 50400
1984-85	1700	170000	3000	1030000 + 50400
		2100500		2470000 +211500
1985-86	1800	290000	4000	650000
1986-87	1800	290000	4000	650000
1987-88	1800	290000	5000	650000
1988-89	2000	290000	5000	650000
1989-90	2200	290000	5000	650000
		1450000		3250000
1990-91	1114	305507	3214	295390
TOTAL	17514	3856007	36714	6326890

SANITATION

1980-81	-	-	-	-
1981-82	2200	313250	-	-
1982-83	2200	313250	-	-
1983-84	2200	313250	-	-
1984-85	2200	313250		
		1253000		
1985-86	2200	720000	1800	92000
1986-87	2200	720000	1800	92000
1987-88	2200	720000	1800	92000
1988-89	2200	720000	1800	92000
1989-90	2200	720000	1800	92000
		3600000		460000
1990-91	1345	712163	2087	94350
TOTAL	21145	5565168	11087	554350

STATE OF MANIPUR



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
MANIPUR

1. INTRODUCTION

The State of Manipur is located in the eastern most corner of India and is a completely land-locked State having an area of 22356 sq.km.

Prior to the out-break of Cholera in the State sometime in 1901, the people of the state depended on river water, community ponds and private ponds. The loss of life in that epidemic compelled the State Government to install a water supply scheme for Imphal Town in 1913 for a population of 40000 heads at 5 gpcd and supply was limited a few priveledged people and a few public standposts. This scheme continued to cater drinking water to the Town until commissioning of 3.2 mgd plant in 1965. This schemes is still continuing to supply water to the town populace and during the Vth & VIth Five Year Plans this has been gradually augmented to 6.2 mgd as in March 83 and a 4 mgd augmentation scheme is in progress at the moment.

As for Rural, upto the end of the IVth plan, no attention was given to take up rural schemes and only in the Vth Plan, a beginning was made. Thus, out of 1280 problem villages only 68 villages could be covered during the Vth Plan and as on 3/83, as many as 512 villages have been covered.

Manipur borders with Burma over a stretch of 352 km. in the east, Nagaland in the North, Assam in the West and Mizoram in the South. Rows of rolling hills cover 90% of the area of this State surrounding in the heart land. In fact, for years together the sole life-line communication for the State has been National Highway 39 connecting Imphal the capital city with the rail-head at Dimapur in Nagaland. It continues to be so though a new link road connects Silchar in Assam by the new Kutcha Road.

Summer is hot and dry in the Central Plain and comparatively cool in the hilly regions; winters are cold in the Central Plain and severely cold in the hill regions. Temperature varies from 0°C to 35°C. The average annual rainfall in 1500 mm. with more concentration in the hills. There is plenty of water during the monsoon but very little during dry season as most of our schemes depend on river sources which normally either dry up or dwindle down to the minimum. Thus, Rural water supply problem is very difficult in nature and there are very little ground water sources.

2. SOCIO-ECONOMIC INDICES

The population of the State though small, is growing at a fairly rapid pace - 10.70 lakhs in 1971 to 14.64 lakhs as per 1981 projection. The density of population stands at 48 persons per sq.km.

There has been sudden increase in population in urban areas. Though the percentage of migration is not correctly known, there is a considerable migration from the states rural areas, Nepal and from adjoining states like Nagaland and Mizoram. The urban annual growth rate is estimated to be 3.8% and for the rural 3% per annum.

Population projection for two Decades

Year	State Total in lakhs				
	Total	Valley		Hill	
		Urban	Rural	Urban	Rural
1971	10.70	1.32	5.90	0.09	3.39
1981	14.64	3.25	6.44	0.39	4.56
1991	19.32	6.30	6.39	0.60	6.03

Self employment in the agriculture sector is the most important economic activity of the State and bulk of the economic activities are carried on within the household sector. At present, about 5.25 lakh heads form the working force population, of which 72.20% are engaged in agriculture. There has been virtually no diversion from agriculture to allied activities, such as plantation and forestry for which there is natural opportunity in the State.

The population distribution is lop-sided with 2/3rd of it concentrated in the small valley and remaining thinly dispersed in the vast hill regions. There is imbalance of development between the hills and valley which causes serious socio-economic problems. Thus, Manipur is far behind the national average in many indices of developments. There is serious back-log in water supply problems more particularly in the rural areas.

It was estimated (73-74) that the State had 66.59% of rural population and 59.16% of urban population living below the pverty line.

Manipur is one of the few states which have a literacy percentage higher than the All India Average. In the valley areas, education was spread more rapidly because of easy accessibility, the hills suffer mostly from communication handicap and thus literacy percentage is low in the hills.

Literacy distribution (1971) population in lakhs

Item	Total Population			Literacy percentage	
	P	M	F	M	F
Total	10.70	5.40	5.30	46.00	19.50
Rural	9.29	4.70	4.59	43.00	16.40
Urban	1.41	0.71	0.70	65.80	40.40

3. HEALTH ASPECTS

The information on morbidity and mortality due to water related diseases is not dependable but nevertheless indicates that there are problems of water-borne diseases in the State. Food consumption pattern, protein and caloric consumption are better in this state in comparison with national average. However, malnutrition is widespread amongst the children, expectant mothers and women in general. Because of the use of untreated water from the rivers and ponds, diarrhoeal diseases are prevalent and due to iodine deficiency endemic goitre is prevalent mostly in the hills.

Howevr rigorous Health Education programme is taken up co-ordinated with Women's Programme, I.C.D.S., and Nutrition Programme etc. to eradicate common diseases and improve health condition of the children and educate the mothers.

4. WATER RESOURCE

Surface water is available in the form of Rivers, Stream, lakes, ponds and springs confined to hilly regions. The total annual availability of water is estimated at 6050 Million Cubic metres of which 3035 million cubic metres is available as run-off, 44 million cubic metres as ground water and balance is lost due to evaporation etc.

There are many natural lakes forming one third of the valley in area but they do not serve the purpose of water supply. Nor do we have any prospect from the various Irrigation Projects except from Singda, Thoubal and Khuga Dams.

Hydrological data studies show very little prospect based on the exploratory works done by the Central Ground Water Board which is being continued by the state public health engineering department.

5. SITUATION ANALYSIS AS ON 31.3.81

There are, one class-I city, 4 class-IV, 10 class-V and 16 class-VI Towns having a targetted population of 429000. Since the beginning of its history of water supply, Imphal City could never be ensured with desired level of service. Since the inception of 1st Scheme in 1913 and even after augmentation in 1965, the plant capacity could not catch up with the growth and huge expansion taking place during the last two decades. The present demand is 11.70 mgd. against which installed capacity is 5.20 mgd.

Other towns: These towns fall within the classes IV, V and VI. All these village cantres which had been declared as small Towns have been covered with water supply. (8 yet to complete during 83-84) but these schemes were taken up at Rural standards at 10 gpcd. Since they are now small towns, Government is proposing to realise tax and therefore augmentation in almost all towns is required. The coverage of population with water supply facilities is 71.7% in urban areas and 24.45% in rural areas i.e. 261 thousands in urban and 269 thousands in rural areas have got water supply facilities. In case of sanitation the coverage is nil.

6. SECTOR ORGANISATION

There are 60 Constituencies in the state (40 valley, 20 hills) with 2 Parliamentary Constituencies (one hill and one valley). There are 6 Revenue Districts which are again sub-divided into 25 Sub-Divisions, of the 6 Districts 5 are in the hills.

The Public Health Engineering Department is headed for administration by a Secretary helped by the Joint Secretary/Under Secretary who co-ordinates all activities at ministry level with various Departments/ministries. For technical administration, the Chief Engineer is the Head who is helped by various Superintending and Executive Engineers in planning, execution and maintenance of schemes both for water supply and sanitation.

7. DECADE PLAN & TARGETS

Rural Water Supply: The target for the Decade is to cover all Rural population by safe water supply. As on 1980, the balance community groups with projected population (1991) is as under:

<u>Community Group</u>	<u>No.</u>	<u>Targetted population lakhs</u>
Grade I (10,000 and above)	X	X
Grade II (500 to 10,000)	5	0.28
Grade III (2000 to 5000)	49	2.07
Grade IV (1000 to 2000)	119	2.16
Grade V (500 to 1000)	156	2.28
Grade VI (500 and below)	1285	2.94
	<u>1614</u>	<u>9.73</u>

Urban Water Supply: Total targetted population of urban areas in Manipur is 429 lakhs during the decade 1981-1990.

Urban Sanitation: It is planned to provide sewerage system to Imphal and septic tanks to sub-urban areas. Low cost patterns including septic tank will be provided to other small towns. A targetted population of 552 thousands will be provided with sanitation facilities among the decade.

Rural Sanitation: There has been no regular sanitation system in the rural areas except pit latrines/septic tanks constructed by householders. It is proposed to provide sanitation facilities with water seal latrines to a targetted population of 310 thousands in rural areas.

8. DECADE PORGRAMME FUNDING

The total estimated requirement of funds for the Decade plan (water supply and sanitation) works out at Rs.80.19 crores as indicated below:

1. Urban Water Supply	Rs. 17.97 crores
2. Urban Sanitation	Rs. 22.56 crores
3. Rural Water Supply	Rs. 38.11 crores
4. Rural Sanitation	Rs. 1.55 crores
	<hr/>
	Rs. 80.19 crores

There was practically no allocation specifically earmarked for water supply upto the 4th Plan (average allocation 2.20% of the states total 4th Plan outlay) and only in the 6th Plan it was raised to 8.90% and therefore no impact or progress could be created upto the end of the 5th Plan.

Thus, in order to achieve the Decade objective, there is a huge resource gap. As against a total requirement of the Decade at Rs.80.19 crores(excluding cost escalation)an amount of Rs.25.75 crores is available in the I Phase of the decade programme during 81-85. The balance amount is to be mobilised in 7th plan and first year of the 8th plan.

The only possible resource is through the External Agencies, grants from Central Government for Centrally sponsored schemes (say about Rs.10.00 crores for 2 plans), assistance from UNICEF in kind for rural schemes. Thus, the state government is to be fully dependent on the Government of India to meet this resource gap.

MANIPUR

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

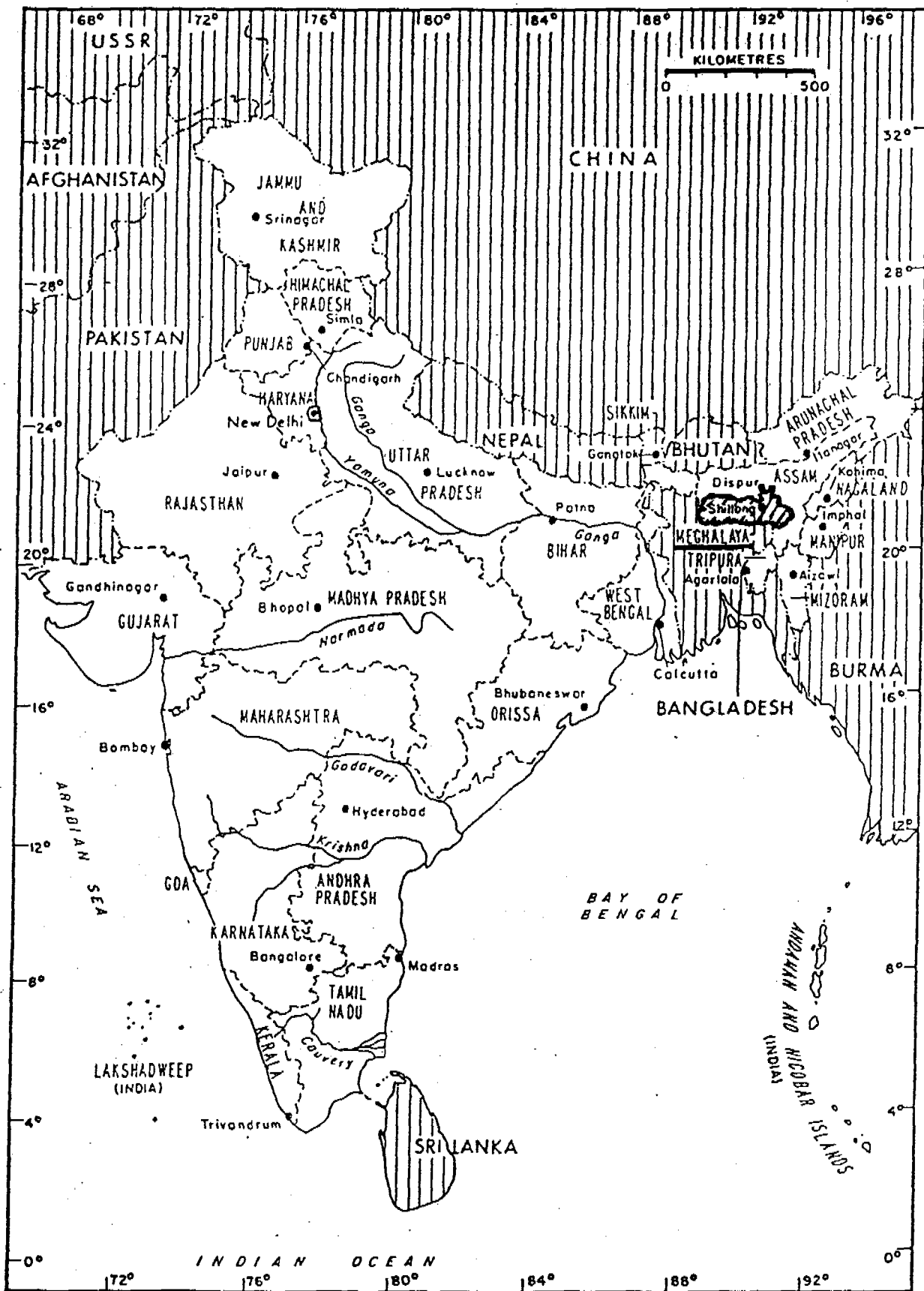
(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	7	16335	206	54800
1982-83	23	9150	104	57200
1983-84	160	7500	113	53500
1984-85	8	3500	131	50000
1985-86	15	25000	71	38000
1986-87	10	21115	71	28000
1987-88	60	25000	71	28000
1988-89	18	25000	71	28000
1989-90	28	25000	71	28000
1990-91	100	26130	64	25565
Total	429	179730	973	381065

SANITATION

1981-82	3	1000	-	-
1982-83	4	700	-	100
1983-84	4	1300	5	200
1984-85	4	1300	5	200
1985-86	90	37000	50	2500
1986-87	90	37000	50	2500
1987-88	90	37000	50	2500
1988-89	90	37000	50	2500
1989-90	90	37000	50	2500
1990-91	87	36300	50	2500
Total	552	225600	310	15500

STATE OF MEGHALAYA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
MEGHALAYA

1. INTRODUCTION

Meghalaya was formed under the North-Eastern Re-organization Act on 2nd April 1970. Before the creation of the State it was a part of the composite State of Assam. During those days, there were very few water supply schemes. The people used to get water from the spring sources through Bamboo pipes etc. Most of the female population used to carry water from the long distance, thus wasting their valuable time. The yield of spring sources either used to be insufficient or the springs used to dry up altogether during dry period. The Public Health Engineering Wing was created in Assam in 1954 under Director of Health Services Assam. After the formation of State of Meghalaya with two Districts of Assam, the Public Health Engineering Wing headed by a Chief Public Health Engineer was created in Meghalaya on 2nd April 1970. The Public Health Engineering Department was bifurcated from PWD in 1972 with the appointment of Chief Public Health Engineer.

Since the formation of the State, Public Health Engineering Department is handling all the water supply and sanitation schemes. The Shillong Municipality is looking after the work of water supply to Shillong town.

Meghalaya has a very salubrious climate the Maximum temperature rarely exceeds 27°C in most of the areas. Mean July temperature of Shillong is 21.18°C. In January the Mean temperature is 9.6°C.

In the Garo Hills Dist. of Meghalaya due to less elevation the summer temperatures are higher than the Shillong plateau while winters are not as cold as Jaintia and Khasi.

2. SOCIO-ECONOMIC INDICATORS

The population of Meghalaya in 1971 was 1 011 699 and in 1981 was 1 321 000. The decadal variation from 1971-1981 in absolute terms was 309 301.

The projected population as on 31 March 1991 which is the target year of completion for the Decade Programme is 16.57 lakhs. Out of which the rural population is 13.29 lakhs and urban population is 3.28 lakh.

Sl. No.	Census Year	Rural population	Urban population	Male	Female	Census total population
1.	1971	864 529	147 170	529 967	490 732	1 011 699
2.	1981 (Projected)	1 095 000	226 000	-	-	1 321 000
3.	1991 (Projected)	1 329 000	328 000	-	-	1 657 000

3. HEALTH ASPECTS

(a) Life Expectancy: Life expectancy is 57 years against India average of 55 years due to salubrious climate etc. It is still increasing, may reach 60 years shortly.

(b) Morbidity and Mortality: No records are available about water borne and water related diseases in the State. It is, however, mentioned that the incidences of gastro-enteritis, diarrhoea, dysentery are quite common. Particularly, in Khasi and Jaintia Hills. Epidemic like Cholera and infectious hepatitis break out almost every year in the State. These water borne diseases are more pronounced generally after a few heavy showers in monsoon. The crude birth rate in the rural and urban areas has been recorded in 1978, as 31 and 19.3 in rural and urban areas respectively. The death rate has been reduced in rural area from 17.6 in 1977 to 9.5 in 1978, while the birth rate marginally reduced from 36.8 in 1977 to 33.3 in 1978. But the infant mortality rate in the rural areas has been recorded as high as 68.8 in 1978 as against 24.8 in urban areas.

4. WATER RESOURCES

Due to the nature of the rock types and irregular terrain conditions, the ground water potential of major part of the State is rather low, excepting the limited area of intermountain valleys and unconsolidated sediments and towards the plains of Assam and Bangladesh.

Ultimate potential in respect of surface water availability is assessed at 15,000 hectameters making the total potential of 100 000 hectameters

5. PRESENT STATUS OF WATER SUPPLY & SANITATION

Urban Water Supply:

Out of the 12 towns of Meghalaya, this organisation had covered 4 towns, viz. (a) Madanriting, (2) Cherrarpunjee excluding the newly established Civil Sub-Division; (3) Nongstoin except Nongstoin Dist. Head Quarter and (4) Pynthorumkhrah covering a total population of 64 000 as on 31.3.81 which covers Shillong Jowai, Tura and Baghmara also with partial water supplies.

The Greater Shillong Water Supply Scheme Phase I, Tura Water Supply Scheme Phase-II, Jowai Water Supply Schemes Phase-II and Williamnagar Water Supply Scheme are in progress.

The drinking water supply to the people is being made through public stand posts (30%), and house connections (70%) approximately.

Rural Water Supply

There are 4 583 inhabited villages in Meghalaya out of which 3 306 villages have been identified as problem villages.

Out of 3 306 problem villages, this organisation had covered 431 villages as on 31.3.81, covering a total population of 1.43 lakhs as per 1971 census population. The balance 2 675 will be covered during decade period. As on 31.3.81 a total population of 216 000 has been covered with water supply facilities.

The drinking water supply to the people is being made through public stand posts in rural areas.

Urban Sewerage and Sanitation

There is no sewerage system existing in Meghalaya. The Shillong Sewerage Scheme, costing approximately Rs.4.27 crores based on 1975 prices was taken up during 1981 and works of preparation of detailed designs and work estimates is entrusted to M/S Kloan Environmental Engineers of Bombay, whose detailed report is awaited. Most of the houses in Shillong, have sanitary latrines maintained by individuals and also have service or dry latrines and the excreta is collected by Scavengers of the Municipality by head load.

Rural Sanitation:

In rural areas common practice is open defecation on Hill slopes or jungles. But in bigger size villages, simple pit latrines are used.

The Public Health Engineering Department carried out programme of promotion of Sanitary latrines in 1976-77 but response was limited.

6. SECTOR ORGANIZATION

The Public Health Engineering Department undertakes all urban water supply schemes, Sewerage and Drainage Schemes Solid Waste disposal Water Pollution Control Schemes and Rural Water Supply Schemes. The Department undertakes deposit works on behalf of local bodies and works of other Govt. Departments and also provides relief and emergency water supplies by sinking tube wells, carriage of water by tankers in case of floods and provisions of emergency water supplies.

The administration of Public Health Engineering Department is under the charge of Secretary, Public Health Engineering Department and is headed by the Chief Public Health Engineer having headquarters at Shillong. He is assisted by one Deputy Chief Public Health Engineer and 3(three) Superintending Engineers (One for Urban, two for Rural), 15 Executive Engineers, 41 Sub-Divisional Officers and 15 Asstt. Engineers (Civil) and one Asstt. Engineer (Mech.) and other Technical and non-technical staff.

The operation and maintenance of the majority of urban and rural water supply schemes are looked after by the Public Health Engineering Department. Only one Urban water supply scheme namely Turn Water Supply Scheme Phase-I is being maintained by the Gare Hills Dist. Council and those under the municipality, are managed by the Municipality Board. The main difficulty in operation and maintenance of the completed schemes is the shortage of Technical manpower.

7. DECADE PLAN TARGETS (POPULATION COVERAGE)

Coverage proposals for Urban as well as Rural Water Supply and Sanitation put year by year and from planning cycle are given in Table below:

Year	Population covered in thousands			
	Water Supply		Sanitation	
	Urban	Rural	Urban	Rural
Vith 5 Year Plan		3.53	-	-
1981-82	18	23.63	-	-
1982-83	7	46.74	-	-
1983-84	7	108.75	-	2.00
1984-85	202	110.75	-	3.00
VIIth 5 Year Plan				
1985-86	5	137.16	28	54.00
1986-87	5	137.16	28	54.00
1987-88	5	137.16	28	54.00
1988-89	5	137.16	28	54.00
1989-90	5	137.16	29	54.00
VIIIth 5 Yr. Plan				
1990-91	5	137.16	121.00	57.00
Total	264	1 113	262.00	332

It has been planned to cover the following population of urban and rural

Water Supply

264 000 persons in urban areas and 1 113 000 persons in rural areas are proposed to be covered during the decade.

Sanitation

262 000 persons in urban areas and 332 000 persons in rural areas are proposed to be covered during the decade.

8. DECADE PROGRAMME FUNDING

The requirement of fund for the decade programme sub sectorwise is as under (1980 price level).

(a) Urban Water Supply	Rs. 2 964.10 lakhs
(b) Urban Sewerage & Sanitation	Rs. 1 371.00 lakhs
(c) Rural Water Supply	Rs. 4 914.40 lakhs
(d) Rural Sanitation	Rs. 166.00 lakhs
Total	Rs. 9 415.50 lakhs

The Sixth Five Year Plan allocation of Meghalaya is Rs.4 439.00 lakhs and in addition, the proposed central allocation for ARP for the plan period is Rs.12.50 crores, thus totalling Rs.56.89 crores.

The sectoral allocation of Meghalaya under sewerage and water supply as follows:

1) Direction and Administration and Investigation, Research, Training and Machinery Scheme	Rs. 100.00 lakhs
2) Sewerage Scheme	Rs. 50.00 lakhs
3) Low Cost Sanitation	Rs. 5.00 lakhs
4) Urban Water Supply	Rs. 2 229.00 lakhs
5) Other Water Supply Scheme (OMNP)	Rs. 100.00 lakhs
6) Rural Water Supply Scheme under MNP	Rs. 1 950.00 lakhs
7) Rural Sanitation	Rs. 5.00 lakhs
	Rs. 4 439.00 lakhs
ARP Fund (Central Assistance)	Rs. 1 250.00 lakhs
	Rs. 5 689.00 lakhs

Out of this outlay for 1980-85, the amount utilised in the first year i.e. 1980-81 has been 6.68 crores under State Plan and Rs.1.49 crores under ARP respectively. Therefore the provisions left for the period 1981-85 will be

Rs.37.71 crores and 11.01 crores respectively i.e. a total of Rs.48.72 crores. The requirement of funds in various plan periods is as follows:

	<u>Rs. in thousands</u>
a) Total for last four years (1981-85) of 6th Five Year Plan	487 200
b) Total for 7th Five Year Plan (1985-90)	387 406
c) 1st Year of 8th Five Year Plan (1990-91)	66 944
Total	<u>941 550</u>
i.e.	9 415.50 lakhs

Mobilisation of Resources During the 7th Plan and
1st Year of the 9th Plan

An amount of Rs.4 543.50 lakhs will be needed during the VIIth Plan and 1st Year of VIIIth Plan to achieve the targets of the decade. It may be mentioned here that the State has provided Rs.44.39 crores for the water supply and sanitation sector in VIth Plan Budget which works out 18.9% of the total state Plan outlay.

However sincere efforts will be made to step up the outlay for this vital sector during the coming plans. Attempts will be made to get loans from 'HUDCO' and L.I.C. for implementing the schemes. Moreover, realistic tarrifs will be imposed and water tax will have to be collected regularly.

MEGHALAYA

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

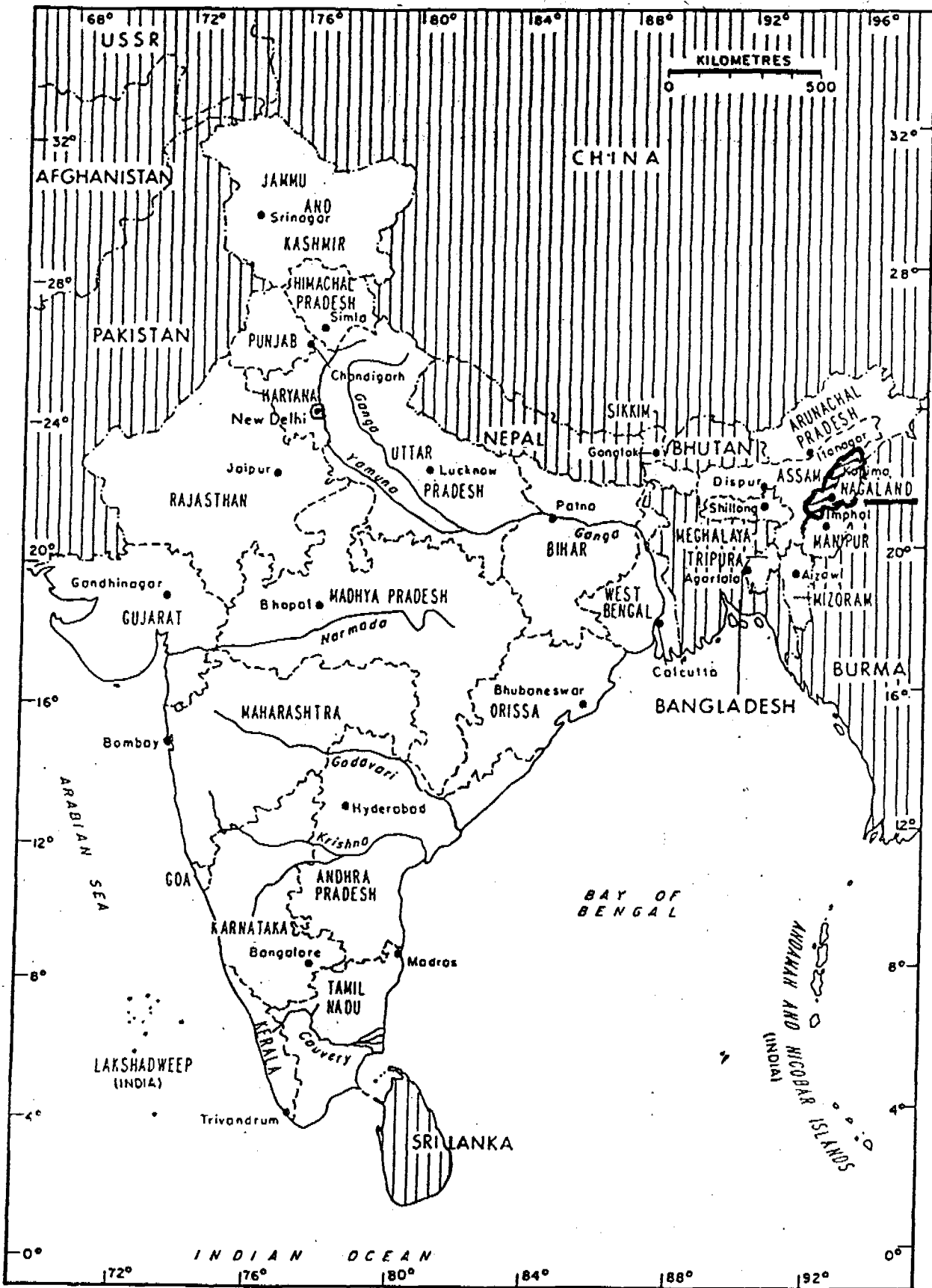
(Population and cost Rs. in thousand)

Year	Urban		Rural			
	Population to be covered	Capital cost to be utilised	Population to be covered		Capital cost to be utilised	
			RWS	RWC	RMS	RWC
1	2	3	4		5	
1981-82	18	15 660	23.63		54 213	
1982-83	7	6 234	46.74		63 748	
1983-84	7	75 500	108.75		85 500	
1984-85	202	83 578	110.75		88 203	
1985-86	5	19 239	137.16		33 296	
1986-87	5	19 239	137.16		33 296	
1987-88	5	19 239	137.16		33 296	
1988-89	5	19 239	137.16		33 296	
1989-90	5	19 239	137.16		33 296	
1990-91	5	19 239	137.16		33 296	
Total	264	296 410	1 113		491 440	

SANITATION

1981-82	-	1 000	-	-
1982-83	-	1 200	-	-
1983-84	-	1 200	2.00	500
1984-85	-	1 600	3.00	500
1985-86	28	22 015	54	2 681
1986-87	28	22 017	54	2 681
1987-88	28	22 017	54	2 681
1988-89	28	22 017	54	2 681
1989-90	29	22 017	54	2 681
1990-91	121	22 017	57	2 195
Total	262	137 100	332	16 600

STATE OF NAGALAND



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
NAGALAND

1. INTRODUCTION

Nagaland State is located in the North Eastern part of India. At the time of attaining Statehood, Nagaland, had three districts which were ultimately converted into seven districts sometime in 1972. The head-quarter of the districts are situated in Kohima, Phek, Wokha, Mokokchung, Zunheboto, Tuensang and Mon. Kohima is the capital town of Nagaland and is situated at height of about 1500 mtrs and 74 kms from Raid head at Dimapur. The Airport and Rail head is at Dimapur in the State.

It is encircled with Assam State in West, and Burma in the East, Arunachal Pradesh in the North and Manipur in the South. The Naga Hill District of Assam got fullfledged Statehood in December 1963. The area of this State is 16527 sq.km. and State is a mostly hilly terrain and having a very small portion of foothill as plain area. The average ra-nfall of Nagaland is 250 cm and has a very moderate climate throughout the year.

The population of Nagaland as per 1971 census is 5,16,000. The provisional census figure of 1981 is 7,78,281 out of this urban population is 86,529 souls. However projected 1981 population fig is 715000. (urban 227000 and rural 488000) and 1991 figure is 958,000 (urban 320,000 and 638,000).

Economic conditions of the State are generally poor. Main income of the State is from Agriculture, Trade & Commerce, contractorship, small scale industries and Govt. service. There is negligible industrial development in the State.

Annual growth rate population projection which have been used for preparation of the Decade Master as follows:

Annual Growth Rate (Percentage)

	<u>Urban</u>	<u>Rural</u>
1971 - 80	34.50	0.52
1981 - 90	4.10	3.07

2. SOCIO-ECONOMIC INDICATORS

The general economic conditions in the State are very poor. The income is merely derived from cultivation of petty contractorship, trade & commerce, small scale & cottage industries and Government service etc.

Income: Basing upon the survey conducted by Economic and Statistics Department of Government of Nagaland, the per capita income at current price was Rs.508/- in 1970-71 and Rs.949/- in 1975-76 and so far the figures available from the Department concerned is Rs.1097/- per capita income at current price for 1977-78.

Literacy: The literacy rate in Nagaland is quite appreciable as per 1981 census being 49.16% where as for 1971 it was 33.72%.

Life expectancy: The average life expectancy in the State at birth is 60 years.

3. HEALTH ASPECTS

Morbidity & Mortality: The following table shows the cases of Hook worms, Guince work, Infective Hepatitis and Dental carries. The statistics are as follows:

	1975	1976	1977	1978	1979	1980
Hook worms	Nil	855	1028	1297	1332	1268
Guince worms	Nil	Nil	Nil	Nil	Nil	Nil
Infective Hepatitis	Nil	3282	3118	5591	3264	4793
Dental Carries	Nil	2792	3117	3128	3332	3441

5. PRESENT STATUS OF WATER SUPPLY & SEWERAGE

397 villages with population of 3,28,000 have been covered with water supply in rural areas and 3 Urban Towns with population of 66,000 have been provided partial water supply. Sanitation is almost non-existent in the Urban and Rural areas. Though a very little development in sanitation by providing sanitary latrines with septic tanks has been made in Government buildings, but still is quite negligible.

Urban Water Supply: As per 1971 census the Urban population of Nagaland was 51,000 and the 1981 projected urban population is 227,000. In fact there are 3 (three) Urban units with class III Town namely - Kohima, the Capital of the State, Mokokchung the District Headquarter and Dimapur. Partial Water Supply has been provided to these 3 (three) towns with coverage of 66,000 Souls, which works out to be about 29% of the total Urban population as per 1981 projected population.

PHED is the only agency providing drinking water to 66,000 population of Urban units. The drinking water is supplied through house connection to about 60% of the covered population and remaining 40% is served through Public Stand Posts.

Rural Water Supply: As per 1971 census the rural population was 464 thousand. However, 1981 census the population in rural areas in Nagaland has gone upto 686 thousand where as the projected population for 1981 census was shown as 488 thousands. The total no. of villages in this State as per 1971 census is 1045. All these villages have been classified as problem villages, as per the norms laid down by Government of India. Most of the identified problem villages fall under the first category viz. "No source of dependable drinking water supply available within a distance of 1.6 km."

As in 31.3.1981, out of the 1045 villages 397 villages have been provided with drinking water supply facilities. The total population covered with drinking water facility has been estimated to be 328 thousands. Majority of the rural population has been served with drinking water supply facility through public stand posts. Being the hilly terrain only surface sources are tapped at present in this State.

Urban Sanitation: Practically the coverage of urban population with sanitary facilities is nil. A negligible percentage of population has got water seal toilets followed by Septic tank system. But majority of the population has got dry latrines for disposal excreta and this particular system is unhygienic. Open surface drains are generally used for disposal of sullage and other waste water of the community. There are no community toilets for public use in the three urban towns of Nagaland.

Rural Sanitation: At present there is no organised sanitation programme in rural areas. Very few people in rural areas use the pit latrine for disposal of excreta. Introduction of safe excreta disposal through household sanitary toilets is very much promising and will be accepted to the rural community without much hesitation.

6. SECTOR ORGANIZATION

In Nagaland Water Supply and Sanitation is looked after by the only Public Health Engineering Department. The PHE Department is headed by a Superintending Engineer with 4 working divisions. The acute shortage of technical personnel in the department is one of the main drawbacks. Some of the technical posts are still to be filled up or are manned by the deputationist from the sister department. The transfer of these deputationists back to their parent department frequently creates set back in efficient functioning of this department. It is under the active consideration of the Government to up-grade the head of the Department to the status of Chief Engineer with more divisions which is very much essential for successful implementation of Decade programme.

7. DECADE PLAN & TARGETS (POPULATION COVERAGE)

The detailed list of projects to be taken up during the Decade with reference to approved annual and Five Year Plan targets and provisions including the proposed targets and for the 7th Five Year Plan. i.e. from 1985-1990 and the first year of the 8th Plan i.e. 1990-91 are shown in the table 13-1. In Urban Water Supply Sector the provisions for first 4 years i.e. 1981-85 is 3.396 crores which will cover 20100 people. A provision of Rs.11.024 crores is provided for the year 1985-1991 to cover an additional population of 23390.

In the Rural Water Supply Sector, there is a provision of Rs.11.00 crores for the first 4 years of the decade to provide water to 266,000 souls. A provision of Rs.4.5245 crores is made for the remaining 6 years of the decade to cover 44,000 population.

In the Urban Sanitation sector, it is proposed to cover the entire Urban towns with low cost sanitation facilities in the form of pour flush system latrines as adopted by UNDP. House hold survey and collection of dates are being done. It is proposed to cover 2,56,000 population with an estimated expenditure of Rs.9.864 crores within the decade.

In the Rural Sanitation sector, a provision of Rs.80.00 lakhs is made to cover 1,60,000 people in Rural areas in the form of simple sanitary water seal latrines.

8. DECADE PROGRAMME FUNDING

The requirement of funds during the programme 1981-1991 based on 1980 prices are as follows:

Urban Water Supply	Rs.14,42,00,000/-
Rural Water Supply	Rs.15,52,45,000/-
Urban Sanitation	Rs. 9,86,40,000/-
Rural Sanitation	Rs. 80,00,000/-
	<u>Rs.40,60,85,000/-</u>

During the 6th Five Year Plan the outlay for water supply and sanitation of Nagaland is Rs.24 crores which is about 15% of the total fund outlay for Nagaland. The revenue collection in the State is negligible. To meet the additional requirement for achieving Decade targets more central assistance has to be obtained and loans from International and Internal financing agencies will have to be sought.

TABLE 13-1

(POPULATION & COST IN THOUSAND)

S.No.	Name of the Project	1981-82		1982-83		1983-84		1984-85		1985-86		1986-87	
		Est. Cost	Pop. covered	Est. Cost.	Pop. covered	Est. Cost	Pop. covered	Est. Cost	Pop. covered	Est. Cost	Pop. covered	Est. Cost	Pop. covered
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	A Urban Water Supply	9000	Nil	9000	Nil	8000	9.4	7960	10.70	18400	23.00	18400	40.0
2.	Rural Water Supply	22700	61.7	33000	74.4	28000	61.9	26300	68.0	8600	5.00	9500	5.0
3.	Urban Sanitation	700	2.0	900	2.0	800	4.0	540	5.0	16000	30.0	15000	40.0
4.	Rural Sanitation	300	Nil	300	8.6	200	5.4	200	6.0	1200	16.0	1000	27.0

1987-88		1988-89		1989-90		1990-91	
15	16	17	18	19	20	21	22
20000	40.0	20000	38.0	16200	50.0	17240	42.9
8000	10.0	6645	5.0	6500	9.0	6000	10.0
17000	50.0	17000	50.0	16000	40.0	14700	33.0
1400	24.0	1000	24.0	1200	20.0	1200	29.0

NAGALAND

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

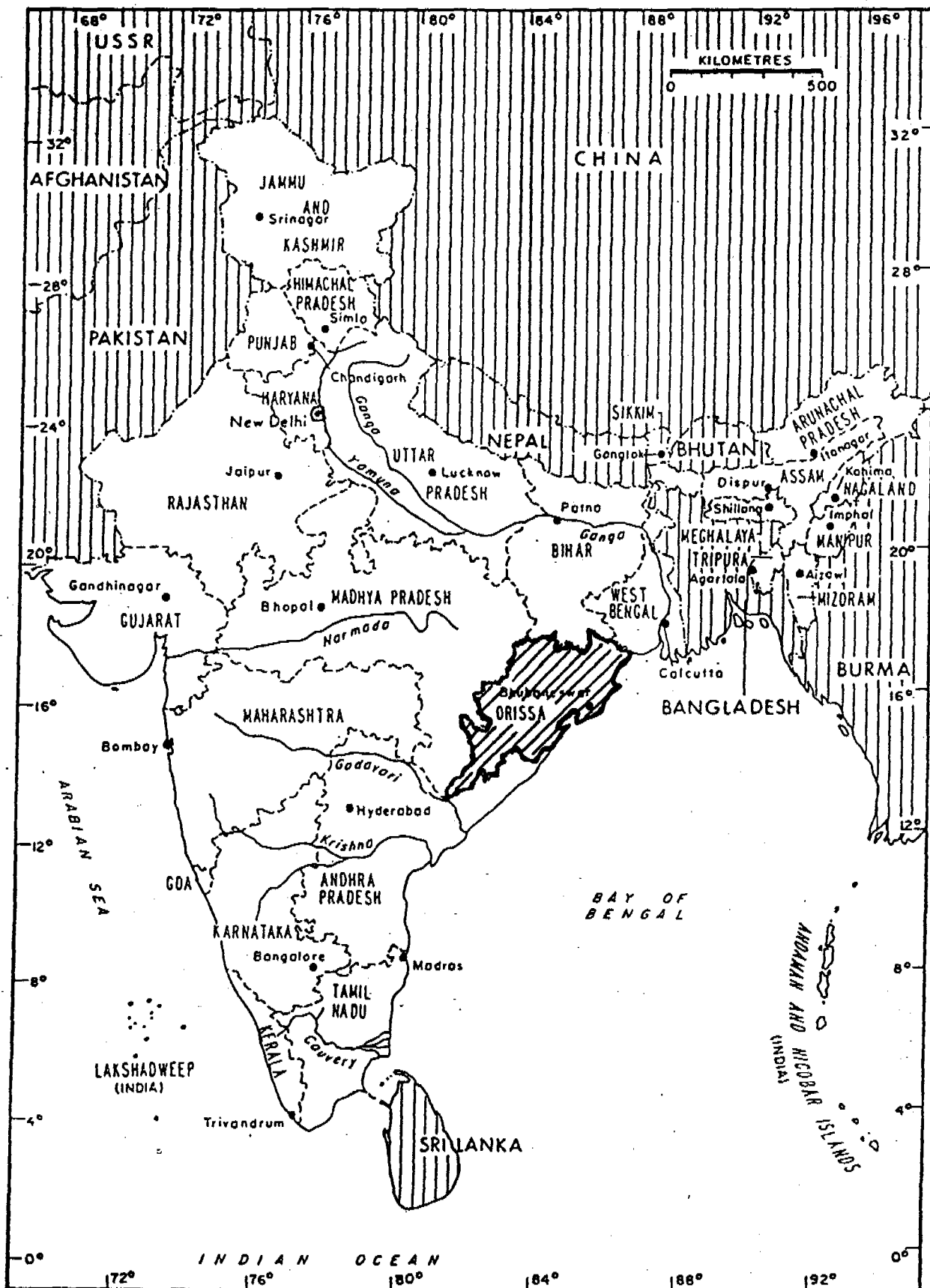
(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	NIL	9000	61.7	22700
1982-83	NIL	9000	74.4	33000
1983-84	9.4	8000	61.9	28000
1984-85	10.7	7960	68.0	26300
1985-86	23.0	18400	5.0	8600
1986-87	40.0	18400	5.0	9500
1987-88	40.0	20000	10.0	8000
1988-89	38.0	20000	5.0	6645
1989-90	50.0	16200	9.0	6500
1990-91	42.9	17240	10.0	6000
Total	254.0	144200	310	155245

SANITATION

1981-82	2.0	700	NIL	300
1982-83	2.0	900	8.6	300
1983-84	4.0	800	5.4	200
1984-85	5.0	540	6.0	200
1985-86	30.0	16000	16.0	1200
1986-87	40.0	15000	27.0	1000
1987-88	50.0	17000	24.0	1400
1988-89	50.0	17000	24.0	1000
1989-90	40.0	16000	20.0	1200
1990-91	33.0	14700	29.0	1200
Total	256.0	98640	160.0	8000

STATE OF ORISSA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
ORISSA

1. INTRODUCTION

Orissa under the British Rule had its water supply confined to a few towns namely Deogarh, Baripada, Sundergarh, Puri and Berhampur. Under the post war development programme Cuttack town had the advantage of piped water supply in 1947.

Location and Geography

The State of Orissa has a total geographical area of 70.1558 million square kilometres. The State is bounded on the North by the State of Bihar, in the West by Madhya Pradesh, on the North-East by West Bengal, on the South by Andhra Pradesh and on the South-East by Bay of Bengal.

As per 1971 census its population was 21.915 millions and ranks eleventh in terms of population among the Indian States. Its urban population was 8.41 percent and rural population 91.59 per cent. The projected population by 1981 (base year) was 27.064 millions consisting 10.09 per cent urban and 89.91 per cent rural. The projected population by 1991 (Target Year) is 32.147 millions consisting 11.84 per cent urban and 88.16 per cent rural. At present there are 96 urban communities and 46992 inhabited villages.

The projected population figure adopted for different decades i.e. from 1981 to 1991 are shown below:-

TABLE - 2
Population Projection for Decade (Population '00)

Year	1981	1991
Rural	243341	283396
Urban	27302	38075
Orissa	270643	321471

Rural and Urban Distribution

As per 1971 census 8.41 per cent, population were observed to be living in 81 urban towns and balance 91.59 per cent residing in 46,992 inhabited villages as against all India figure of 80.10 per cent.

2. SOCIO ECONOMIC INDICATORS

The increase in per capita income of Orissa at 1970-71 prices was only Rs.19.00 or 3.9 per cent during the period of 9 years ending 1978.79. The per capita income of India recorded a rise of Rs.79.00 or 12.5 per cent during the same period. It is observed that in spite of the professed objectives in reduction of regional imbalances, Orissa is sliding back in the economic scale.

As per 1977-78 prices, Orissa had the maximum number of rural poor with 71.01 per cent of its population living below the poverty line. The percentage of people in urban areas living below the poverty line was 43.38.

The percentage of literacy per 1000 population in the State and in the country, as per 1971 census reveals that the level of literacy in the State is below the all India standard.

3. HEALTH ASPECTS

TABLE-3

Crude birth rate, Crude death rate
Infant Mortality rate (per thousand)

Year	Crude birth rate	Crude death rate	Infant mortality rate
1975	33.54	17.90	149.23
1976	34.92	16.48	124.20
1977	30.16	17.85	166.63
1978	32.88	14.26	136.54
1979	32.30	15.00	150.00

Year	Prenatal Mortality rate	Neonatal Mortality rate	Post neonatal Mortality rate
1975	45.77	85.16	64.07
1976	67.59	80.43	45.77
1977	70.31	80.86	86.78
1978	67.00	74.54	62.00

The expectation of life at birth in 70-72 in the State was 48.20 years and at age 10 it was observed to be 52.57 years. The expectation of life in India for 1971-76 for males and females as per projection was found to be 50.10 and 48.80 respectively which was almost in par with the State's studied figure.

4. WATER RESOURCES

Summary of Water balance

Orissa is rich in water resources but for the most part remains under developed. The State is well covered with a net work of rivers, streams and drainage ways which annually discharge about 95,000 million cubic metre into the Bay of Bengal. Besides the State has considerable ground water potential particularly in the delta areas.

The State of Orissa receives average annual rainfall of 234300 millions of cubic metre out of which the quantity lost as surface run off to the sea through the net work of river system has been estimated as 95,000 millions of cubic metre. The balance quantity of 139300 million is partly lost through evaporation and transpiration and partly enter into the soil. Assuming the losses due to evaporation and transpiration as 25 per cent of the balance quantity the amount of rainfall penetration into the soil as gravitational water is 104475 million cubic metre. Allowing 50 per cent of the quantity to be lost through slow downward movement of the ground water towards the sea and a part held up in undeterminable sub-surface reservoir or as capillary moisture in clay zone, the quantity of utilisable ground water is roughly estimated to be 52180 million cubic metre.

5. PRESENT SITUATION OF WATER SUPPLY AND SEWERAGE

Urban Water Supply

Out of 96 urban communities 75 have piped water supplies serving 1.072 millions or 39.27 per cent of the urban population by 31.3.1981. Among 75 urban water supplies, 38 have piped water supplies in rural pattern designed to enter at the rate of 45 lpcd approximately. In order to achieve the Decade targets by 1991 a balance of urban

population of 2.735 millions have to be served by piped water supply.

Rural Water Supplies

Among 46,992 rural inhabited villages as per 1971 census 27,077 villages are so far identified as problem villages according to criteria prescribed by Government of India. Till 31.3.1981, there exist 67 rural piped water supplies serving 0.19 millions. In other villages, mostly identified problem villages 5.592 millions are served partly or fully by tubewells fitted with hand pumps and 2.08 millions are served partly or fully by dug wells. Summing up, 7.862 millions forming 32.31 per cent of the rural population had drinking water supply by the end of 31.3.1981.

By and large, studies reveal that 2200 rural villages qualify for full coverage with respect to 1991 projected population. Statistics also indicate that 5340 identified problem villages are fully covered and 9629 identified problem villages partly covered as per 1971 census population by tubewells.

Rural Water Supplies are entirely met out of State and Central grants as a social obligation. In order to achieve the Decade targets by 31.3.1991, 20,478 millions of unserved population have to be provided with drinking water supply.

Rural Sanitation

The coverage in this sub-sector is nil. As per Decade programme 7.085 millions are to be provided with rural sanitation facilities.

6. SECTOR ORGANISATION

Mainly all the activities in the field of water supply and sanitation are managed by the P.H.E.O. headed by a Chief Engineer under the administrative control of Housing and Urban Development programme, Government of Orissa. Construction of Dug wells for drinking water supply is managed by the Community Development and Rural Reconstruction Department. Surveillance is looked by the P.H.E.D. and State Health and Family Welfare Department. The Planning and Coordination Department formulates the State's Plan.

Among the Urban Local Bodies, only local bodies of Berhampur and Deogarh are operating and maintaining water supply schemes. Likewise, water supply and sanitation of Rourkela Steel Township and Sunabeda (H.A.L.) Township is maintained by Steel Authority of India Ltd.

7. DECADE PLAN TARGETS - POPULATION COVERAGE

Basing on the targets set forth during the Decade, subsectorwise target population to be served during the decade - (i) by 31.3.1985 and (ii) by 31.3.1991 are as outlined below:

TABLE-4

Population in millions

Sl.No.	Sub-sector	Target coverage 31.3.1985	Target coverage 31.3.1991
1.	Urban Water Supply	0.361	2.735
2.	Rural Water Supply	7.709	20.478
3.	Urban Sanitation	0.050	2.755
4.	Rural Sanitation	-	7.085

Coverage Projects

The Decade Plan envisages:-

(a) Urban Water Supply

To provide piped water supply to 96 urban communities.

(b) Rural Water Supply

To cover 1398 communities through Piped Water Supply Schemes. For other villages by spot sources through bore holes fitted with hand pumps or with power pumps where suitable or sanitary dug wells.

(c) Urban Sanitation

To provide sewerage system with sewage treatment plant in all seven Class I cities by means of construction of low cost pour flush water seal latrines, conversion of bucket type latrines to sanitary latrines and construction of public latrines with attendants in towns other than Class I in order to achieve overall coverage of 80 per cent.

(d) Rural Sanitation

Low cost rural sanitation in deserving areas of 46992 villages to achieve 25 per cent recommended coverage.

8. DECADE PROGRAMME FUNDING

Based on the prices prevalent during 1980, experience of works in hand and criteria recommended in Water Supply and Sewerage Manuals, the requirement of funds in relation to the targeted coverage are protected. Sectorwise break-up target population and projected cost figures are given below.

TABLE-5

S.No.	Sub-sector	Investment cost (Rupees in million)
1.	Urban Water Supply	867.60
2.	Rural Water Supply	1886.52
3.	Urban Sanitation	761.21
4.	Rural Sanitation	354.25
	Total	3869.58

Mobilisation of Resources

The total requirement of financial resources to achieve the targets set forth by the end of March 1991 is estimated at Rs.3869.58 millions. The total available outlays during the initial four years (1981-85) forming the part of the Sixth Five Year Plan (1980-85) is only Rs.741.468 millions which is 19.16 per cent of the total Decade Plan.

The balance decade plan requirements of Rs. 3128 million have to be provided during the balance six years (1985-1990) i.e. Seventh Plan and first year of Eighth Plan.

9. SUPPORT PROGRAMMES

Inter-Sectoral Coordination

For successful implementation of the Decade Programme in the country, it would be advantageous to link projects in other sectors and programmes of the water supply and sanitation sector.

For instance under the major and minor irrigation projects, many reservoirs canal systems and tube wells are being constructed. Though these resources are basically meant for irrigation purposes, looking to the inadequacy of resources for drinking water supply schemes the resources could also be utilised for drinking water supply schemes wherever feasible from the point of view of location of beneficiary villages.

To link up the Decade Programme with those in related sectors like Rural Development, Health, Industries, Education and Social Welfare could contribute in a great measure to the achievement of Decade goals. The conference of the State Secretaries, Chief Engineers and Heads of Implementing Agencies held on 3 February 1982 had recognized this and resolved that the State level Apex Committee be requested to ensure such coordination at the high policy making level..

Health Education and Community Participation

The community may be educated on the health benefits of safe drinking water and hygienic sanitation facilities through the Health Guide Scheme. Without such education there will be no impact on community health despite investment on water supply and sanitation facilities. Mass media like Radio, Television, Films etc. may be made use in this effort.

Community involvement in water supply and sanitation, particularly in rural areas, may be encouraged. The beneficiaries may be associated in all stages from planning to operation and maintenance as far as possible.

ORISSA

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMMEWATER SUPPLY

(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	174	19926	1790	118535
1982-83	69	22950	2347	234140
1983-84	85	27750	1568	173375
1984-85	33	11018	2004	120074
1985-86	237	78596	1277	124040
1986-87	356	117893	1915	186059
1987-88	475	157191	2554	248079
1988-89	594	196489	3192	310099
1989-90	475	157191	2554	248079
1990-91	237	78596	1277	124040
Total	2735	867600	20478	1886520

SANITATION

1981-82	9	2581	-	-
1982-83	7	2050	-	-
1983-84	12	3250	-	-
1984-85	22	5819	-	-
1985-86	270	74751	709	35450
1986-87	407	112127	1062	53100
1987-88	541	149502	1417	70850
1988-89	676	186877	1771	88550
1989-90	541	149502	1417	70850
1990-91	270	74751	709	35450
Total	2755	761210	7085	354250

**ON-GOING PROJECT ASSISTANCE
BY WORLD BANK/IDA AND BILATERALS**

PROJECT	TOTAL COST	EXTERNAL ASSISTANCE (Rs. in Crores)
<u>World Bank/IDA</u>		
1. Bombay water supply and sewerage project	354.00	190.51
2. Maharashtra water supply and sewerage project (Urban and Rural)	86.00	46.66
3. Gujarat water supply and sewerage project (Urban and Rural)	136.00	69.98
4. Punjab water supply and sewerage project (Urban)	67.00	36.94
5. Rajasthan water supply and sewerage project (Urban and Rural)	138.00	77.76
6. U.P. water supply and sewerage project (Urban and Rural)	<u>60.00</u>	<u>38.88</u>
Sub-total	841.00	460.73
<u>Netherlands</u>		
1. Andhra Pradesh Rural Water Supply	11.40	10.96
2. Gujarat Rural Water Supply	9.00	9.07
3. Water supply scheme for Deotsidh group of villages in Hamirpur, H.P.	1.24	1.13
4. Nattika Kirka and Chirayinkil water supply scheme in Kerala (Rural)	10.26	10.81
5. U.P. Rural water supply in distts. of Rae Bareilly, Allahabad and Varanasi	14.91	13.31
6. U.P. Rural water supply II in distt. of Agra, Mathura and Etawah	<u>9.24</u>	<u>8.24</u>
Sub-total	55.95	53.53
<u>Denmark</u>		
1. Karnataka Rural water supply	7.60	2.31
2. Rajuvenation of Handpump scheme in Karnataka	4.07	2.49
3. Rajuvenation of Handpump scheme in Madhya Pradesh	6.60	4.33
4. Orissa Rural water supply Phase I (Rs.22 crores - preparatory Phase 1.2 crores)	1.20	1.23 ¹
5. Tamil Nadu Rural water supply	11.00	1.87 ²
6. Rajuvenation of Handpumps in Salan and South Arcot Distts. of Tamil Nadu	<u>.93</u>	<u>.91</u>
Sub-total	31.40	13.14
<u>Federal Republic of Germany</u>		
1. Rural water supply scheme in M.P.	19.47	9.51
<u>European Economic Community</u>		
1. Rural water supply project in M.P.	15.50	18.00 ²
Total	<u>963.32</u>	<u>554.91</u>

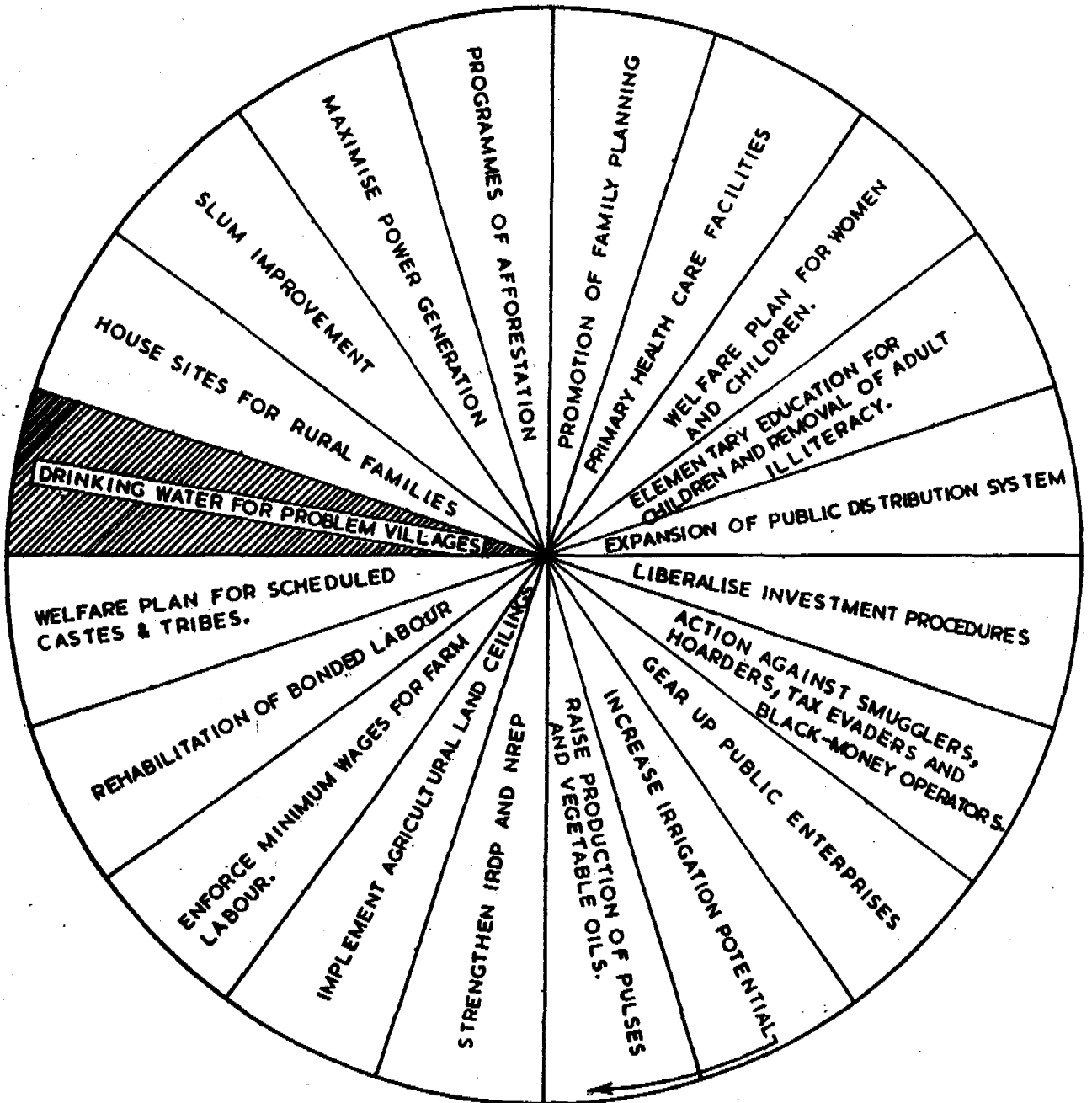
1 Preparatory phase

2 Counterpart fund

ASSISTANCE TO PROJECTS IN PIPELINE
BY WORLD BANK/IDA AND BILATERALS

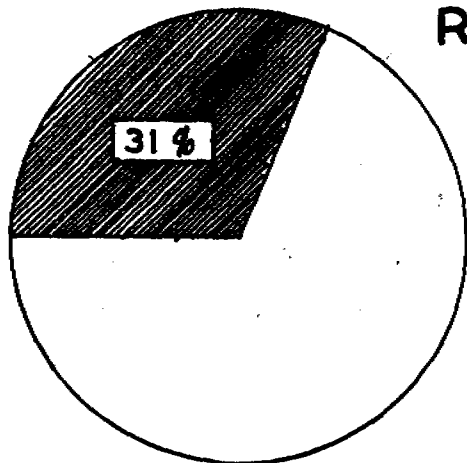
PROJECT	TOTAL COST (Rs. in crores)
<u>World Bank/IDA</u>	
1. Bihar Water Supply Project	96.64
2. Kerala Water Supply Project	105.00
3. Tamil Nadu Water Supply & Sanitation Project	123.21
4. Halida Water Supply Project	121.15
Sub-total	445.96
<u>Netherlands</u>	
1. Improvement to Logwalti-Bomson Water Supply scheme in Hamirpur District of H.P.	.21
2. Rural Water Supply Scheme in Pavaratty and adjoining Panchayats in Kerala	.17
3. Kundara water supply scheme in Kerala	7.17
4. Mala, Annamanada, Kiezhur and Poyya water supply scheme in Kerala	3.40
5. Koippuram Water Supply Scheme in Kerala	.92
6. Charianad Water Supply Scheme in Kerala	.42
7. Thrikkunna Puzha water supply scheme in Kerala	.14
8. Comprehensive water supply scheme for Kuttanad area in Alleppey district of Kerala	7.52
9. Water supply project in Jaipur district of Rajasthan	5.60
Sub-total	25.55
<u>Denmark</u>	
1. Comprehensive water supply scheme for Kolacherry and adjoining Panchayats in Cannanore district of Kerala	3.65
2. Comprehensive water supply scheme for Edappal and adjoining Panchayats in Malappuram district of Kerala	1.98
3. Comprehensive water supply scheme for Chekode and adjoining Panchayats in Malappuram district of Kerala	8.10
4. Rural water supply and sanitation programme in Salem and South Arcot districts of Tamil Nadu	12.85
Sub-total	26.58
<u>European Economic Community</u>	
1. Ferozpur Rural water supply scheme in Punjab	4.26
2. Rural water supply scheme for fluoride affected areas of Coimbatore and Perriyar districts of Tamil Nadu	15.50
Sub-total	19.76
Total	517.85

THE NEW TWENTY POINT PROGRAMME

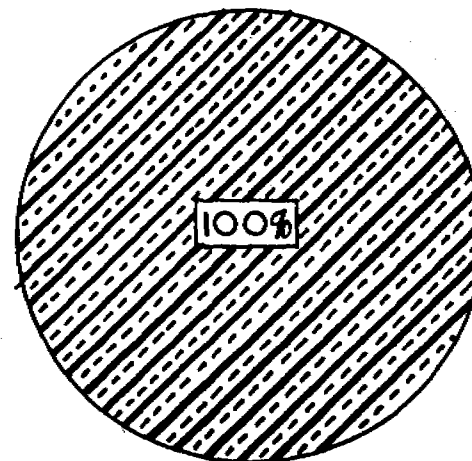


COVERED AS ON 31.3.1981 AND TARGET TO BE ACHIEVED BY 31.3.1991

RURAL WATER SUPPLY

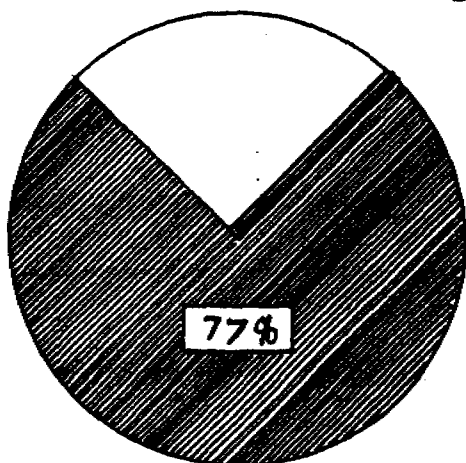


AS ON 31.3.1981

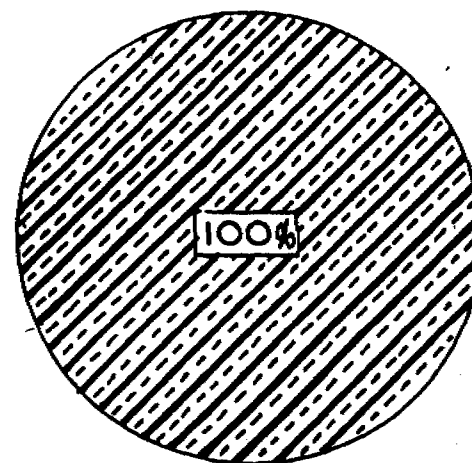


TARGET FOR 31.3.1991

URBAN WATER SUPPLY



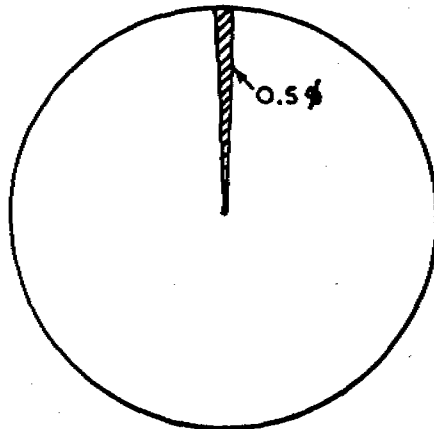
AS ON 31.3.1981



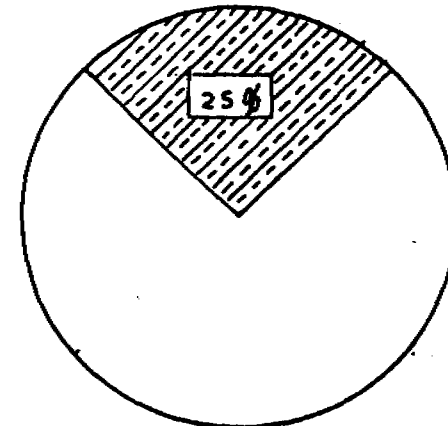
TARGET FOR 31.3.1991

COVERAGE AS ON 31.3.1981 AND TARGET TO BE ACHIEVED ON 31.3.1991

RURAL SANITATION

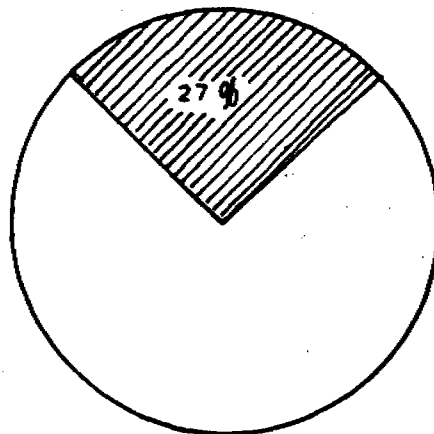


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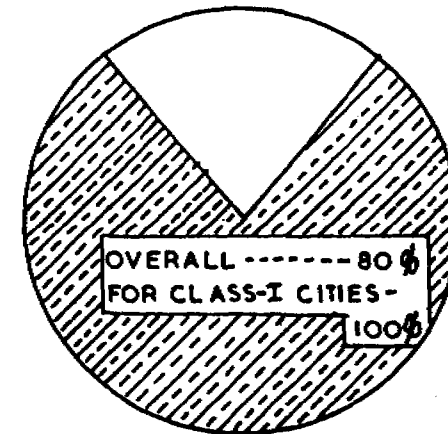


TARGET FOR 31.3.1991

URBAN SANITATION

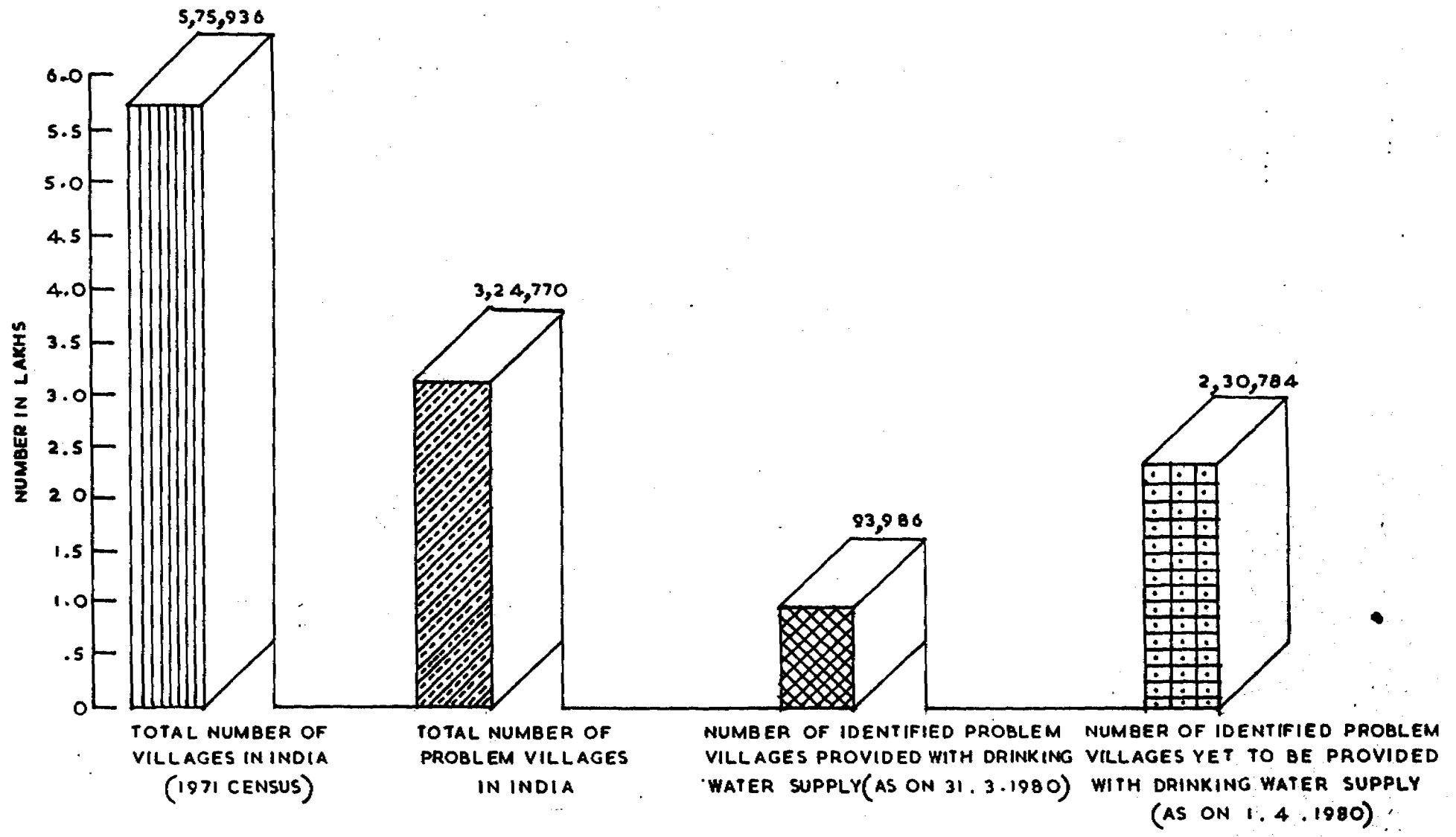


AS ON 31.3.1981

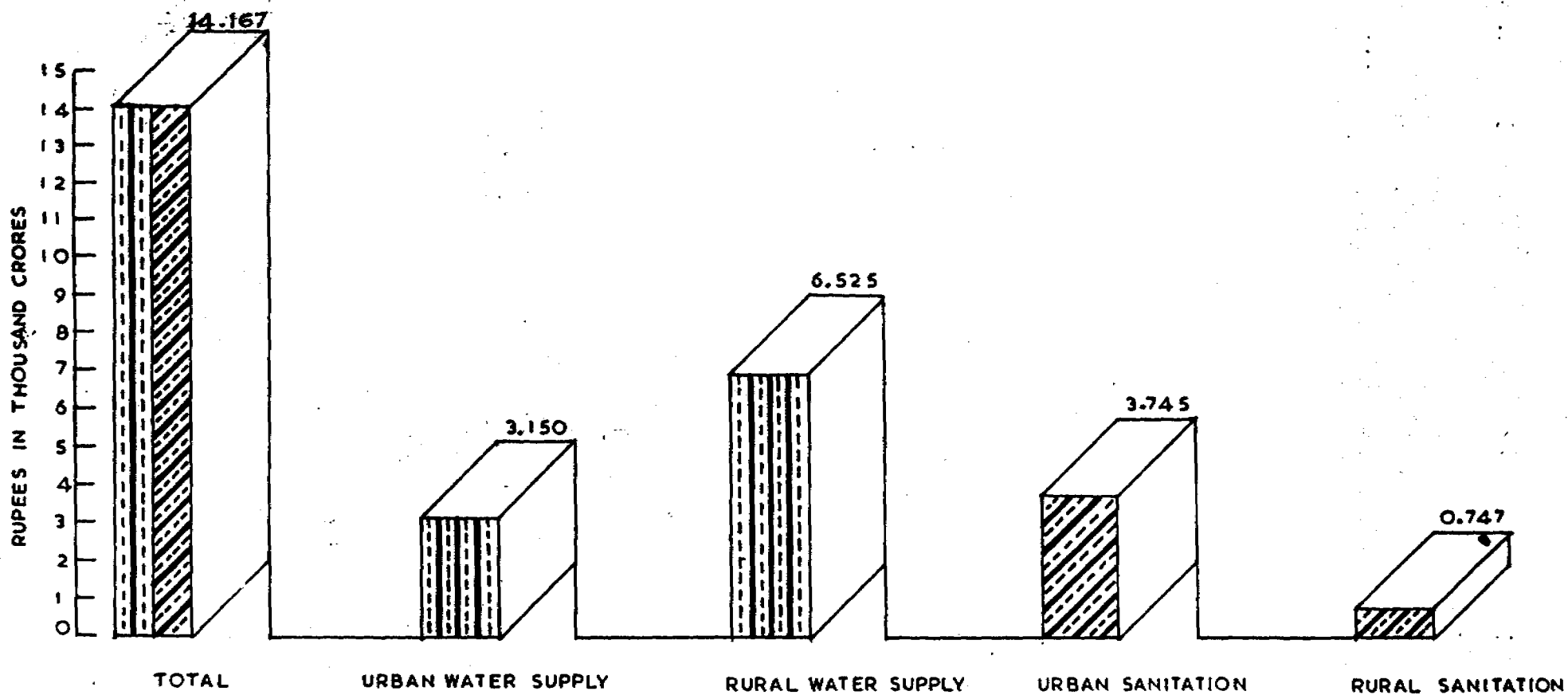


TARGET FOR 31.3.1991

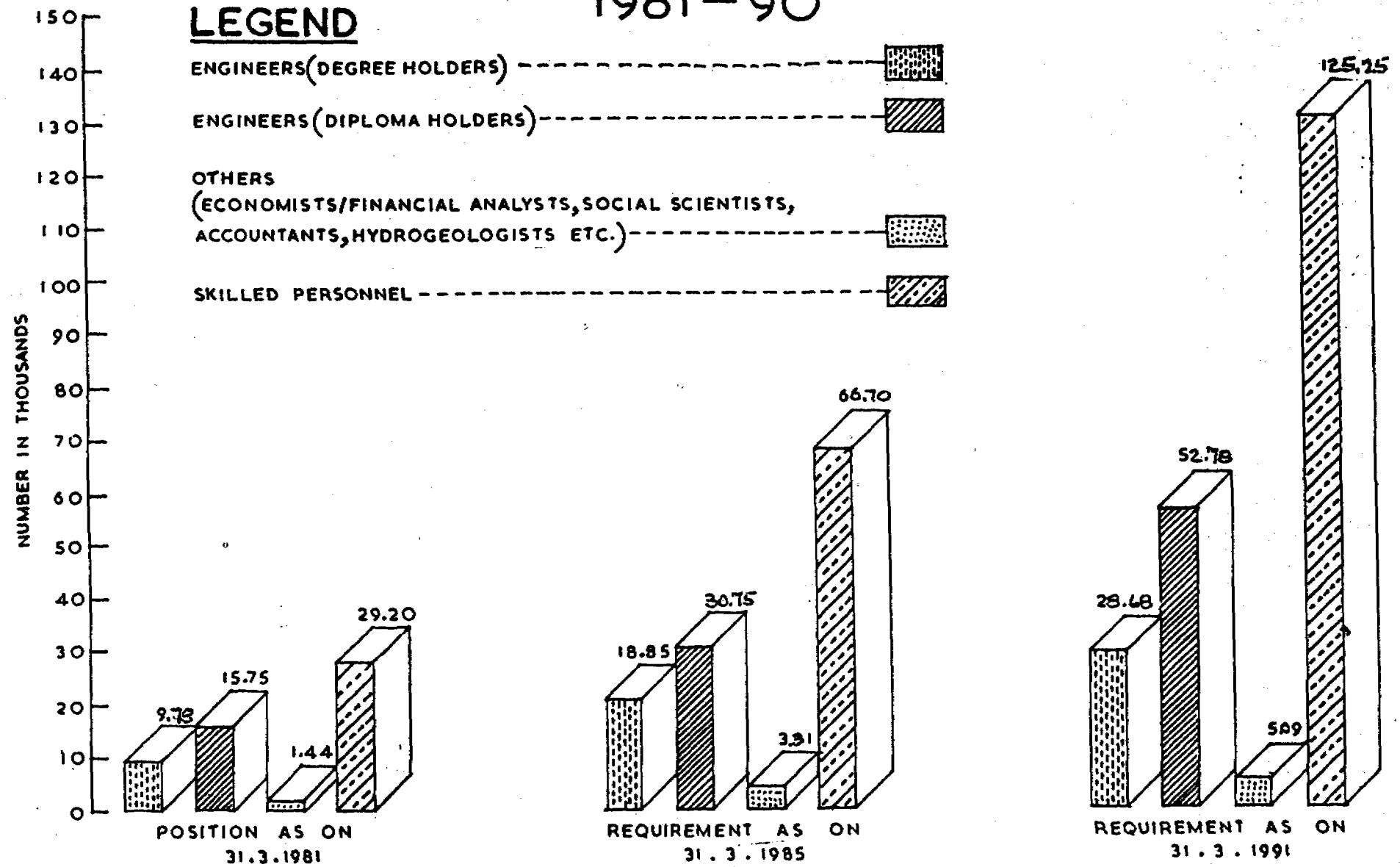
RURAL DRINKING WATER SUPPLY IN INDIA



REQUIREMENT OF FUNDS FOR ACHIEVING THE TARGETS FOR THE DECADE PROGRAMME (1981 - 90) (TENTATIVE)



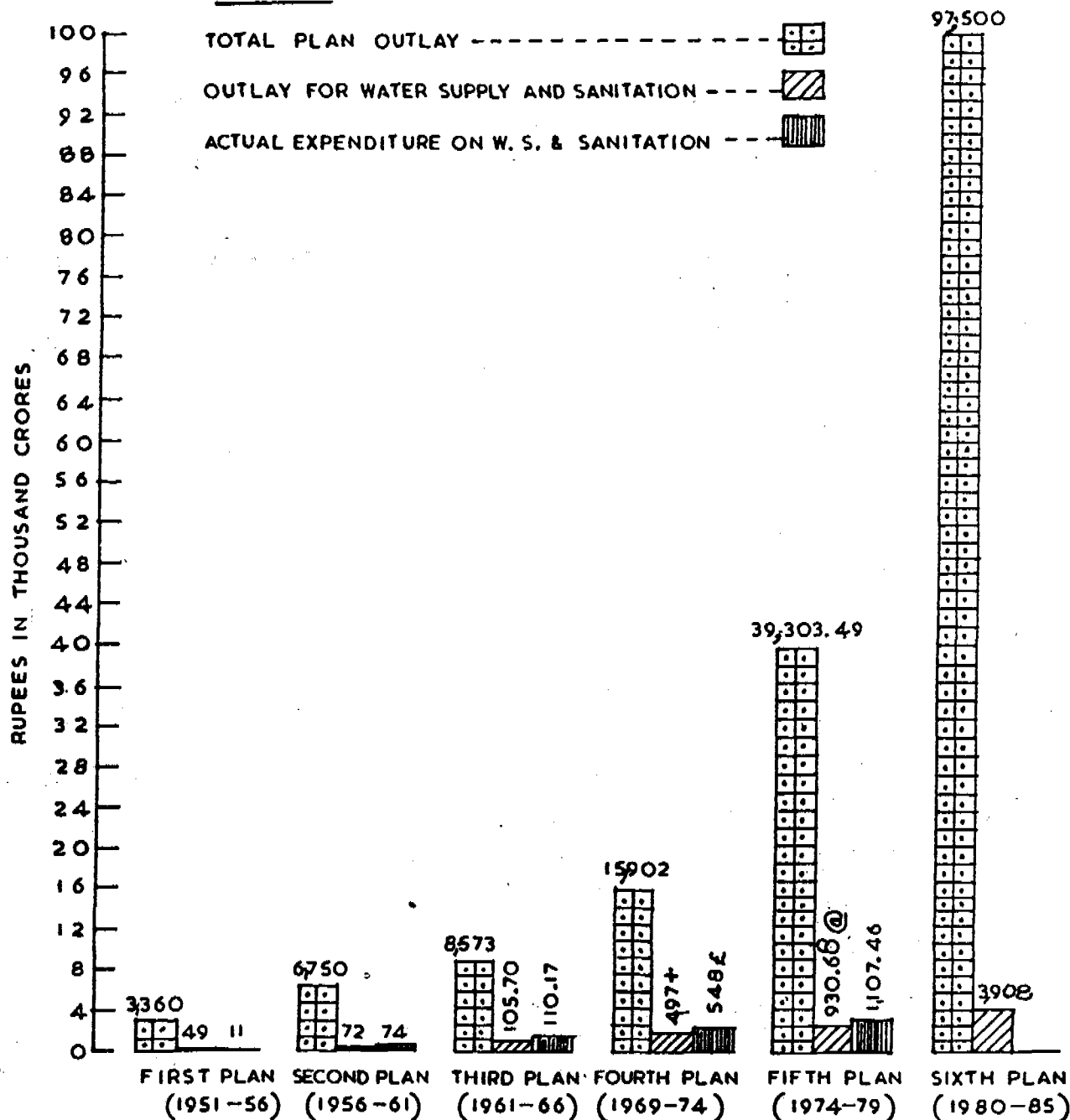
TENTATIVE REQUIREMENT OF MANPOWER FOR THE INTERNATIONAL WATER SUPPLY AND SANITATION DECADE. 1981-90



WATER SUPPLY AND SANITATION SECTOR OUTLAY / EXPENDITURE DURING VARIOUS PLANS.

NOTE: FIGURES IN THE GRAPH ARE OF PLAN OUTLAYS

LEGEND

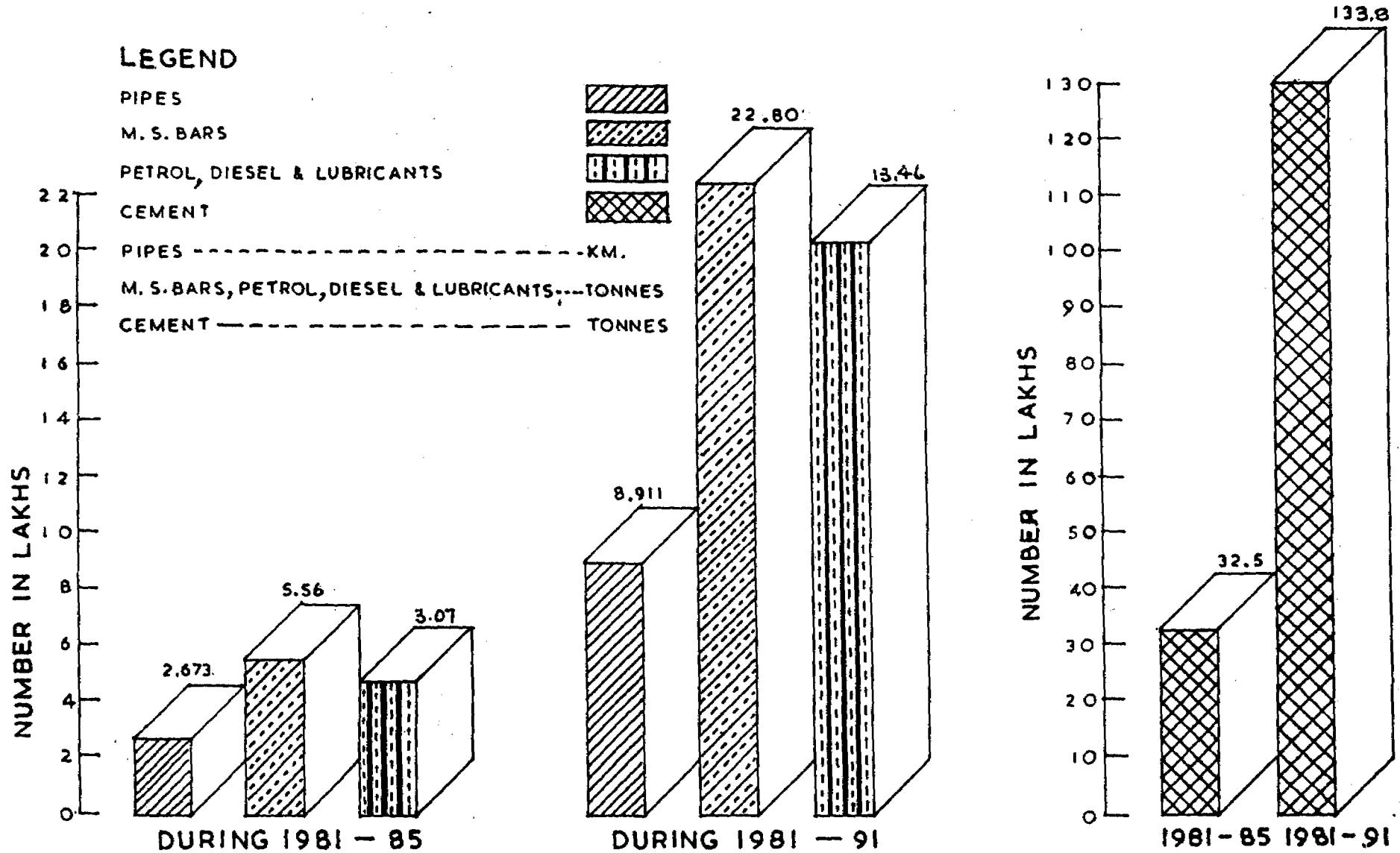


+ EXCLUDING Rs. 34.10 CRORES RELEASED UNDER CENTRALLY SPONSORED RURAL WATER SUPPLY PROGRAMME (ARP) SUBSEQUENT TO PLAN FINALISATION.

£ INCLUDING LIC LOAN ASSISTANCE WHICH WAS NOT REFLECTED IN THE STATE PLANS.

@ EXCLUDING Rs. 100 CRORES PROVIDED FOR ARP SUBSEQUENT

TENTATIVE REQUIREMENT OF IMPORTANT MATERIALS FOR THE INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981 - 90



VOLUME I

PART I

APPENDIX II

NATIONAL WATER RESOURCES

NATIONAL WATER RESOURCES

1. PHYSIOGRAPHICAL DIVISIONS

India has seven physiographical divisions consisting of the Northern Mountains, Great Plains, Central Highlands, Peninsular Plateau, East-coast and West-coast belts and the Islands.

2. RIVER SYSTEMS

The river systems of India are classified in two groups, the perennial rivers of Himalayan region and the rivers of peninsular India. The former which are fed by the melting snows and glaciers of the great Himalayan range are often uncertain and conspicuous in their behaviour. Some of the rivers in the Himalayan range meander and are subject to drastic changes of course, particularly following landslides and earthquakes caused by seismic activity. The dry weather flows are significantly enhanced by water from melting snow and glaciers, which dry period is in the winter.

The rivers of peninsular India originate at much lower elevations and flow through areas which are geologically more stable. They are more predictable in their behaviour and their flows are characterised by heavy discharges during monsoons followed by low discharges during rainless months.

3. RAINFALL

The total volume of water source replenishment by precipitation is of major significance. Precipitation varies greatly, however, not only in distribution but in extent and in timing, depending on meteorological and atmospheric conditions and on physical conditions which prevail on the land surface.

There are tracts where the rainfall is heavy with the highest annual rainfall in the world occurring in Assam. The maximum annual rainfall ever recorded of 1,042 inches occurred in this State. In some areas, there is a scarcity of rainfall, less than five inches with an average annual rainfall of about 45 inches. Map 1 shows the distribution of rainfall throughout the country. There are two distinct monsoons, the Southwest monsoon starting at the southern most point in Kerala in May and sweeping across the entire country during June to September, and the Northeast monsoon occurring in October to March with reduced precipitation and confined to Kerala, Tamil Nadu and a few showers in the Northern States of Punjab, Uttar Pradesh and Bihar. Due to deep deposits of alluvium in the Gangetic basin and some coastal regions and fault zones in river basins like Narmada, there are large areas of exploitable ground water in storage available as potential water supply sources.

4. SURFACE WATER RESOURCES

In 1945-46 the Central Water & Power Commission was established and started the scientific assessment of the country's water resources. The Commission has collected statistical data from different agencies and States and conducted investigations and compiled measurements from several gauging stations on river basins.

It has been estimated that the total annual flow of all river systems in India is approximately 1,672,600 million cubic meters (1,357 million acre-feet). Table 1 shows details of river system flows and Table 2 basin reservoir storage. Map 2 shows India's rivers and drainage basins.

5. GROUND WATER RESOURCES

5.1 Ground Water Potential

Estimation of ground water resource potential and extent of its utilisation in various parts of the country is, by and large, based on different empirical methods adopted from time to time. Significant steps were taken only in the last decade when extensive and intensive scientific studies through multi-disciplinary ground water projects were undertaken by the Central Ground Water Board (CGWB) and some State ground water organisations to evaluate the ground water resource available for development. Most of the country still remains to be subjected to such detailed studies, and until then, ground water resource estimates for various parts of the country will continue to vary greatly in both accuracy and orders of magnitude.

5.2 Effective Use of Ground Water

The unused ground water potential is one of the principal assets of a Nation that is demanding more water each passing year. When properly used, this water will help assure an adequate supply of drinking water and other domestic needs, provide the needs of growing industry and ensure stable sources for irrigation demands and other water requirements. At present approximately 50 per cent of the irrigation demands in India are being met from ground water sources.

There are three important soil and rock formations in the country, which have a bearing on ground water yields. A very large portion of the nation, nearly 1.2 million sq km consists of consolidated hard rock formations comprised of either trap basalts or other types of rocks, such as slates, granites and gneisses. As these rocks have little pore space, ground water occurs only in the weathered porous mantle or in physical openings of joints, fractures and shear planes in the rock mass. In inter-trappean formations, water is sometimes found between layers and these areas are generally considered to support only dug wells, but in some cases, however, borewells have yielded from 10,000 to 30,000 gallons per day.

In the semi-consolidated formation, which cover about 50,000 sq km, sedimentary rock formations of sandstone, limestone and conglomerates occur. They generally have characteristics of excellent porosity. These formations occur in Rajasthan, Gujarat and Tamil Nadu. Tubewells and deep dug wells are feasible in these formations and can yield good amounts of water.

5.3 Total Ground Water Potential

A rough estimation of total ground water potential in the country is about 210 million acre-ft. The Central Ground Water Board has assessed the available potential of ground water on a scientific basis in 17 States. These figures are given in Table 3. Information is also available on a District-wise basis with the Central Ground Water Board for use by these States for their water supply needs.

6. USE AND AVAILABILITY OF WATER RESOURCES

River basins differ in their size and potentialities. Most of our major rivers are inter-State. As a result there is competition for river water not only between the various uses within a State but also between riparian States. An estimate of water resource availability is as follows:

Resource	Quantity	
	million cubic meters (mcm)	million acre-ft. (maf)
Surface Water	1,672,600	1,357
Ground Water		
Exploited	45,000	37
Potential	210,000	171
Total Availability	1,927,600	1,565

Water Use Estimates By Year 2000		
Use	Annual Quantity	
	mcm	maf
<u>Agriculture</u>		
Irrigation	860,000	698
Live Stock	5,640	5
Power	150,000	122
<u>Sub-total Agriculture</u>	1,015,640	825
<u>Sub-total Industrial</u>	35,000	29
<u>Domestic</u>		
Urban & Rural	62,000	51
40% urban 60 gpd		
60% rural 30 gpd		
Population 2000: 900 million		
<u>Sub-total Domestic</u>	62,000	51
<u>Total Agriculture, Industrial & Domestic</u>	1,112,640	905

Though there is an adequate amount of water, there are a number of difficulties and constraints in the availability and uses of the water by the entire nation.

There are serious hydrological limitations in the availability of water resources in different regions of the country and for planning its maximum utilization.

While the major use of water resources has been and will continue to be for irrigation because of the large demands in comparison to other needs, the most important use of water resources relative to the health and welfare of the people is for drinking water supplies for cities, towns and villages. In the years ahead more water will be needed for industries, river conservancy, stream pollution abatement, ground water sullage, reclamation of land, recreation and the preservation of wild life.

To meet the various long term requirements in an orderly manner, there should be an established priority for water use. The priority accorded to any particular requirement vis-a-vis others should depend upon its economic contribution and its significance to the well being of people. Drinking water supplies and other domestic requirements must be given the highest priority. Industries and commerce, major contributors to the nations economy, use relatively small quantities of water but their requirements are essential to continued operation and should receive a high priority.

Water pollution control should intensified as the discharge of existing and future industrial waste effluents into the nation's streams will affect water quality and create serious problems for the towns and villages that use these rivers and streams as their water sources.

Long term planning for the development of water resources should not only take into account quantitative water requirements, but also should be concerned with source determination, surface or ground, and the selection of sources best suited to the particular requirements of both quality and quantity. Unless water resources are marked for specific purposes, imbalances may occur with less expensive sources committed to those purposes that can afford higher costs, while the more expensive sources remain committed to those purposes least able to afford them, which may prove to be unreasonably burdensome.

May 3 shows difficult and problem areas in respect of drinking water sources.

RIVER SYSTEM FLOWS IN INDIA

Region	Catchment Area (square miles)	Annual Run-off (Acre feet millions) (maf)
1. Rivers discharging into the Arabian Sea (excluding the Indus system)	189,790	251.46
2. Indus basin	136,673	64.43
3. Rivers discharging into the Bay of Bengal, other than Ganga and Brahmaputra Systems	467,309	334.03
4. Ganga system	376,818	397.09
5. Brahmaputra system	185,460	308.95
6. Rajputana	64,887	-
Total	1,430,937	1,366.96

or 1,672,599 mcm

mcm = million cubic meters
maf = million acre ft.

BASIN RESERVOIR STORAGE IN INDIA

DETAILS OF WATER STORAGE IN INDIA

Basin	State	Project	Live storage million cu. m.
1	2	3	4
(Storages less than 500 million cu. m. each are not listed individually)			
<u>Major river basins</u>			
1. Indus	Himachal Pradesh	Bhakra Nangal Beas II (Pong)	7 442.9 6 976.0
		Total	<u>14 418.9</u>
2. Ganga	Bihar	Panchet Hill Maithon Tenughat Others	1 313.1 1 358.4 727.3 827.2
			<u>4 226.0</u>
	Madhya Pradesh	Gandhi Sagar Others	6 910.9 969.6
			<u>7 880.5</u>
	Rajasthan	Ranapratap Sagar Others	1 567.8 967.5
			<u>2 535.3</u>
	Uttar Pradesh	Matatila Rihand Ramganga Tehri Others	780.0 8 971.1 2 190.4 2 613.4 2 717.0
			<u>17 271.9</u>
	West Bengal	Kangsabati Mayurakshi Others	972.4 554.6 35.4
			<u>1 562.4</u>
		Total	<u>33 476.1</u>
3. Brahmaputra	Assam	Others, Total	141.5
4. Sabarmati	Gujarat	Dharoi Others	776.6 240.0
		Total	<u>1 016.6</u>
5. Mahi	Gujarat	Kadana Panam Others	1 216.9 679.2 72.6
			<u>1 968.7</u>
	Rajasthan	Bajajsagar Others	2 016.4 300.4
		Total	<u>2 316.8</u>
6. Narmada	Madhya Pradesh	Tawa Others	<u>2 080.1</u> 470.3
		Total	<u>2 550.4</u>
7. Tapi	Maharashtra	Girna Others	526.4 533.8
			<u>1 060.2</u>
	Gujarat	Ukai	<u>7 088.3</u>
		Total	<u>8 148.5</u>
8. Subarna-Rekha	Bihar	Others, Total	283.1
9. Brahmani & Baitarni	Orissa	Salandi Rengali	556.8 3 396.0
		Total	<u>3 952.8</u>
10. Mahanadi	Madhya Pradesh	Setiara Others	764.1 895.1
			<u>1 659.2</u>
	Orissa	Hirakud Others	5 798.8 468.1
			<u>6 266.9</u>
		Total	<u>7 926.1</u>

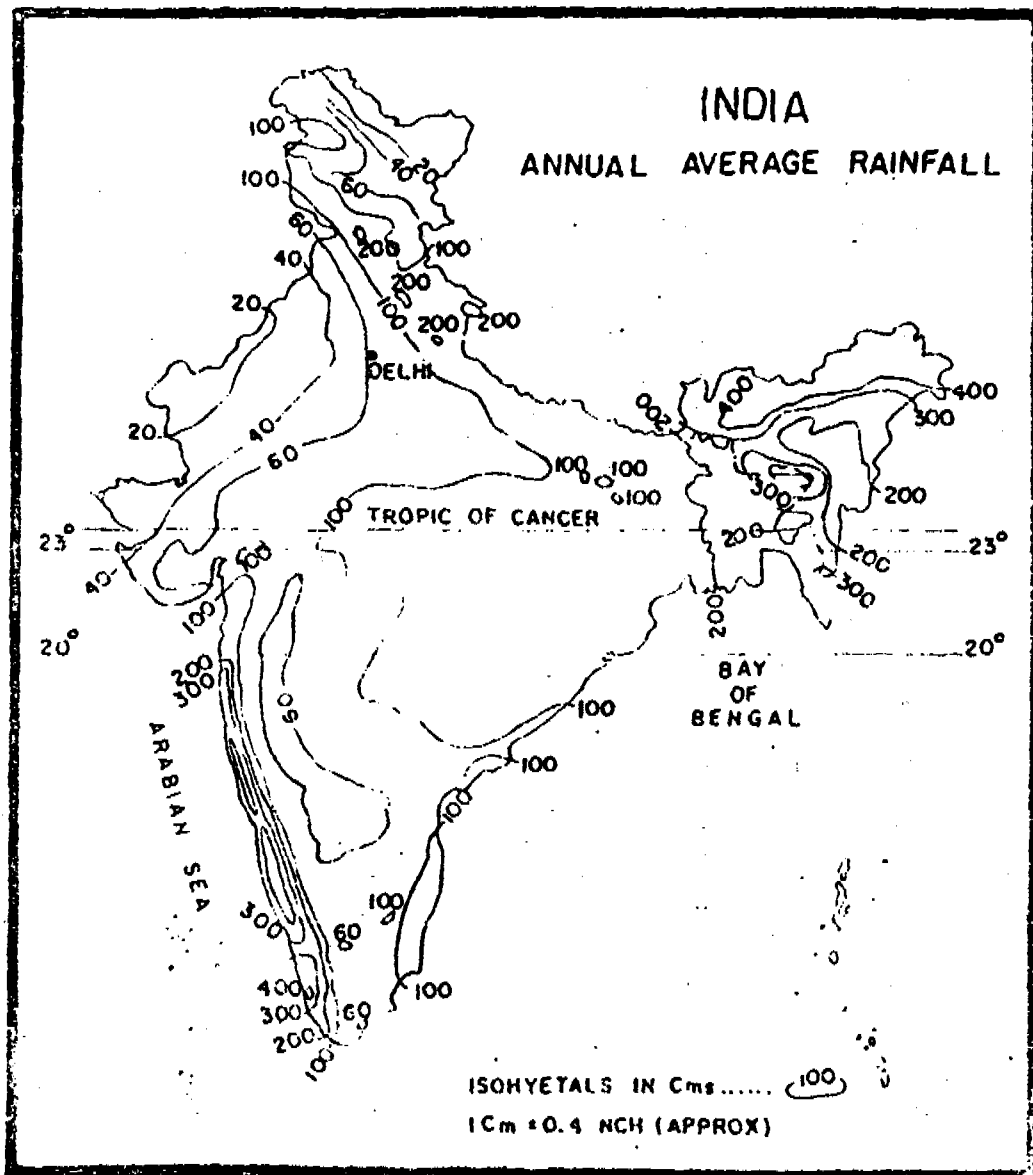
1	2	3	4
11. Godavari	Andhra Pradesh	Nizamsagar	724.6
		Pochampad	2 303.6
		Others	381.8
			<u>3 412.0</u>
	Maharashtra	Mula	608.7
		Jayakwadi I	2 171.3
		Purna	960.0
		Pench	1 579.6
		Others	2 058.5
			<u>7 378.1</u>
Orissa	Jalaput	751.3	
	Balimela	2 829.2	
		<u>3 580.5</u>	
Madhya Pradesh	Others	487.6	
	Total	<u>14 858.2</u>	
12. Krishna	Andhra Pradesh	Nagarjunasagar	5 461.9
		Srisaillam	5 943.0
		Others	440.6
			<u>11 845.5</u>
	Karnataka	Bhadra	1 783.9
		Tungabhadra	3 698.8
		Malaprabha	866.0
		Upper Krishna I	862.4
		Ghataprabha & Others	1 749.0
			<u>8 960.1</u>
Maharashtra	Warna	996.2	
	Bhima	1 709.3	
	Krishna	730.7	
	Koyna	2 673.9	
	Total hydel works	1 160.3	
	Others	<u>1 784.0</u>	
		9 054.4	
	Total	<u>29 860.0</u>	
13. Pennar	Andhra Pradesh	Somasila	1 877.2
		Others	101.3
		Total	<u>1 978.5</u>
14. Cauvery	Karnataka	Krishnarajasagar	1 268.6
		Others	200.4
			<u>1 469.0</u>
	Tamil Nadu	Mettur	2 646.4
Lower Bhavani		899.9	
Others		462.6	
		<u>4 008.9</u>	
	Total	<u>5 477.9</u>	
	Total Major Basins	<u>128 374.1</u>	
<u>Medium and Minor Basins</u>			
	Rajasthan	Others	181.9
	Orissa	Others	47.6
	Gujarat	Damanganga	501.1
		Others	1 618.0
	Goa	Others	227.0
	Maharashtra	Others	314.1
	Andhra Pradesh	Others	320.7
	Karnataka	Sharavati	4 245.0
		Kalanadi	3 962.0
	Tamil Nadu	Parambikulam Aliyar	673.5
		Others	1 479.7
	Kerala	Iddiki	1 542.4
		Kallada	506.6
		Edamalayar	1 017.6
		Others	1 815.2
		Total Medium and Minor Basins	<u>18 452.4</u>
		Total all Basins	<u>146 826.5</u>

GROUND WATER POTENTIAL IN MAJOR STATES IN INDIA

Name of State	Utilisable Resources	Net Draft	Potential available for future development		State of Ground-water Development (percentage)
	mcm	mcm	mcm	maf	
1. Andhra Pradesh	36 600	7 400	29 200	23.7	20
2. Assam	16 500*	200	16 300	13.2	1
3. Bihar**	28 600	5 900	22 700	18.4	21
4. Gujarat**	20 300*	6 900	13 400	10.9	34
5. Haryana**	8 800*	6 200	2 600	2.1	70
6. Jammu & Kashmir	1 800	100	1 700	1.4	5
7. Karnataka	13 000	1 800	11 200	9.1	14
8. Kerala	6 900	300	6 600	5.4	3
9. Madhya Pradesh	59 500	4 900	54 600	44.3	8
10. Maharashtra	34 500	6 500	28 000	22.7	19
11. Orissa**	21 500	900	20 600	16.7	5
12. Punjab**	13 100*	9 600	3 500	2.8	73
13. Rajasthan**	18 300*	4 600	13 700	11.1	25
14. Tamil Nadu	26 900	9 900	17 000	13.8	37
15. Tripura**	300	-	300	.2	-
16. Uttar Pradesh**	92 700	26 800	65 900	53.5	29
17. West Bengal**	16 400	4 900	11 500	9.3	30
Total	415 700	96 900	318 800	258.6	23.3

* The figures of utilisable resource is calculated based on the fluctuation between June and November and hence the whole recharge is taken as utilisable recharge. In other States where recharge is calculated by rainfall infiltration method, 70% of gross recharge has been taken as utilisable resource.

** The figure of ground water potential for these States are tentative and are being reconciled with the respective State ground water departments.



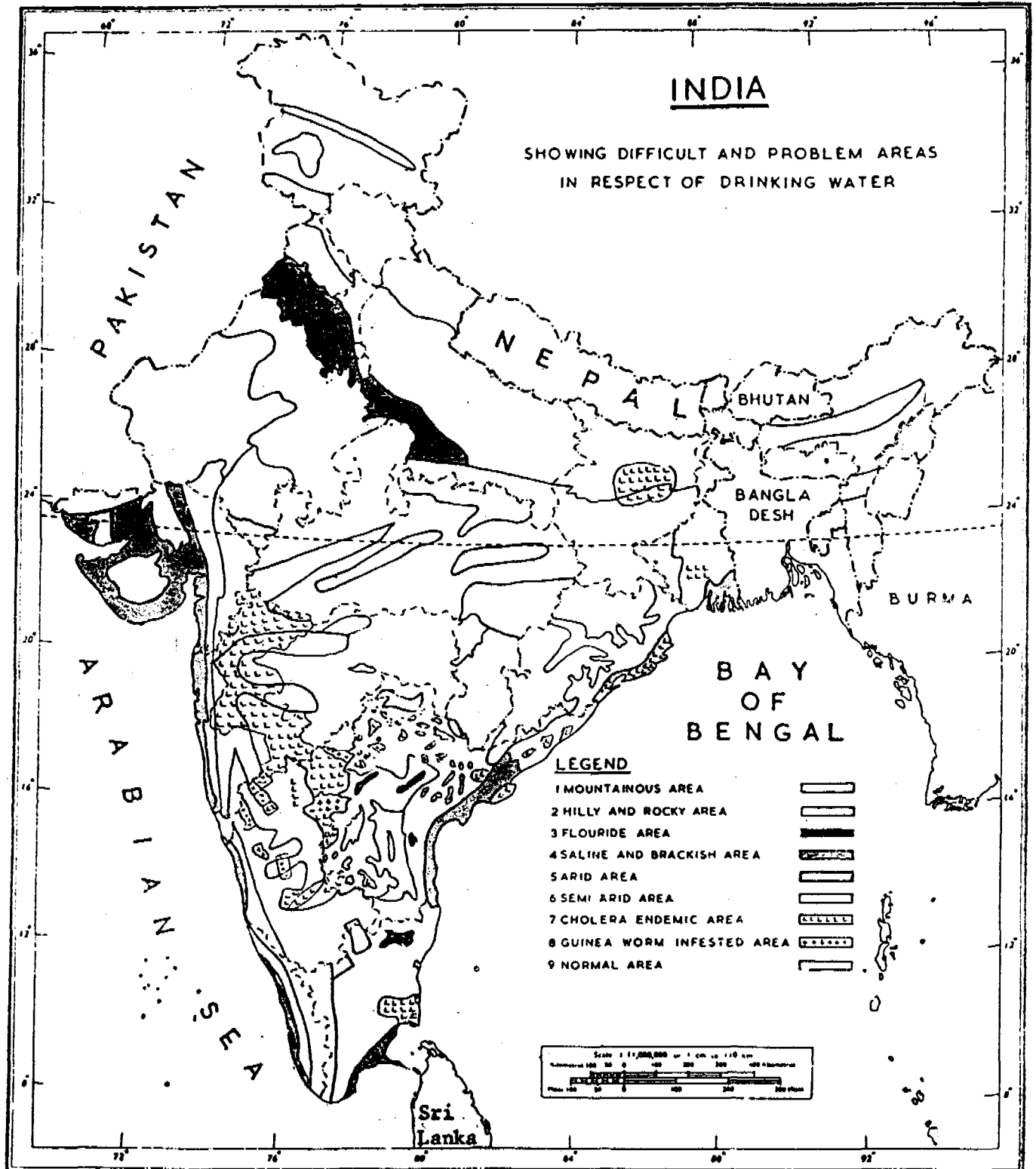


Fig. No. 2785 MD 71-300 '72
Based upon Survey of India map with the permission of the Surveyor General of India

The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line
The boundary of Ponghlaya shown on this map is as interpreted from the Assam Reorganisation (Ponghlaya) Act, 1969 but has yet to be verified
Ponghlaya is an autonomous state within the state of Assam

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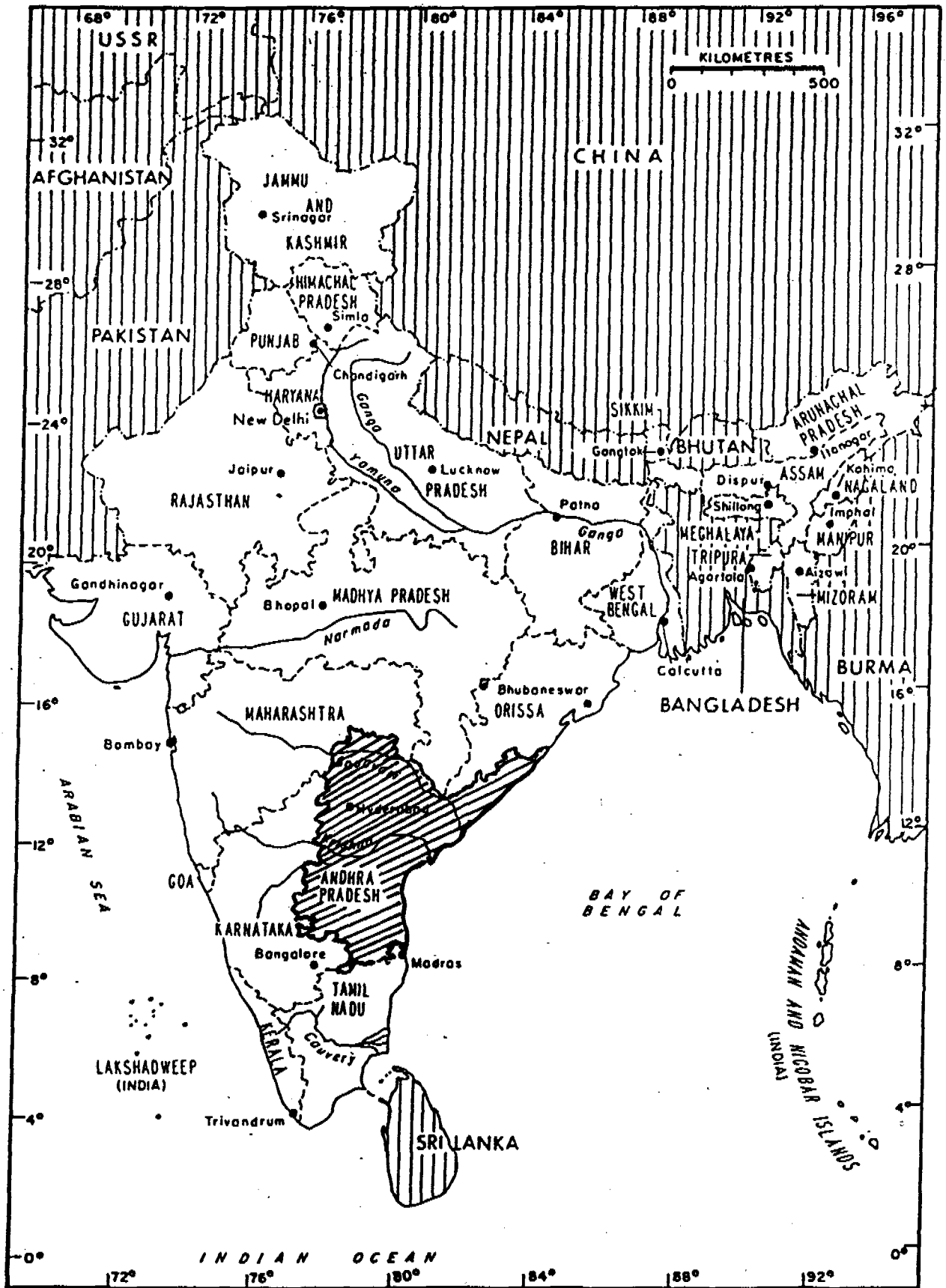
VOLUME I

PART II

APPENDIX III

EXECUTIVE SUMMARIES OF DECADE PLANS IN WATER
SUPPLY AND SANITATION FOR STATES AND UNION TERRITORIES

STATE OF ANDHRA PRADESH



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
ANDHRA PRADESH

1. INTRODUCTION

The State of Andhra Pradesh with an area of 277,000 Square Kilometres and population of 51.40 Million is the fifth largest State in India and also the fifth in rank in population accounting for 8.4% of the area and 7.9 per cent of the population of the country. It is situated in the south-eastern part of India. The State was formed on 1st November, 1956 by merging Telangana area of the erstwhile Hyderabad State with the then Andhra State. Hyderabad is the capital of the State and the state capital is also popularly referred to as Twin Cities (Metropolitan Hyderabad). During the first Five Year Plan (1951-56) provision for water supply and sanitation was included under 'Health' in the category of 'SOCIAL SERVICES'. In subsequent plans, however, separate provision is being made for 'WATER SUPPLY AND SANITATION', but it is continued under the category of 'SOCIAL SERVICES'.

The State of Andhra Pradesh is bounded on the north by Orissa and Madhya Pradesh States and on the south by Tamilnadu, Karnataka and Maharashtra states about the Western boundaries of the State and the Bay of Bengal is on the east.

The climate is generally tropical monsoon and is characterised by hot-summers and mild winters. A greater part of the state falls under 'Tropical Savannah A.W.'. While the humid coastal belt and comparatively dry districts are classified as 'Moist tropical' and the 'Dry Steppe' physiography as per Kooppens classification.

The state receives about two thirds of its rainfall from south-west monsoon from June to September and about one fourths from North-east monsoons between October and December. The mean rainfall is 894mm.

Three distinct physiographic regions exist in the State - i) Coastal Plain with elevation ranging upto 200 meters above the mean sea level, sloping from west and east. ii) Eastern Ghats which range in the north east and south-west direction with an elevation of 610 to 1220 M above the mean sea level. iii) Western Pene Plain which forms part of Deccan Plateau and is characterised by gentle slopes and rolling topography with flat undulating tracts interspersed by valleys.

2. SOCIO-ECONOMIC INDICATORS

In Andhra Pradesh, 47.1% of the state's area of 2,76,814 K.M. is considered to be chronically drought affected. Another 42.3% of the area of the State comprises of backward areas which also include tribal areas. Thus about 89.4 per cent of the area of the State is either chronically drought affected or economically backward. The per capita income of the State is also among the lowest in India. Andhra Pradesh state deserves highest priority consideration in the International Drinking Water Supply and Sanitation programme as such.

There are 23 districts in the state which are broadly grouped into three regions (i) Coastal Andhra (area 93,000 Sq.K.M.), (ii) Rayalaseema (area 69,000 Sq.K.M.) and (iii) Telengana (area 115,000 Sq.K.M.). The three regions differ considerably from each other in their social and economic conditions. The Coastal Andhra Region is dominated by fertile delta of Krishna and Godavari rivers but ending in the north in an economically backward and predominantly tribal strip. Rayalaseema is a chronic drought-prone area with limited potential for agriculture development. Telengana is rich in natural resources and has been lagging behind in economic development due to historical factors. Thus it may be seen that a major portion of the State is underdeveloped. The population of the state as per 1971 census was 43,432 thousands. As per 1981 projection the population was assessed as 51,410 thousands of which 11,045 thousands urban and 40,365 rural as per 1991 projection, the population works out to 59,992 thousands of which 14,270 thousands in urban and 45, 727 thousands in rural.

As per 1971 census the number of literate is 7.3 million which works out to 24.57%. The rate of literacy among the females is 15.75% and that among males 33.18%. The rate of literacy in urban areas which is 47.08% is higher when compared to that in rural areas which is only 19.19%. 57.3% of urban males and 36.31% of Urban females are literate. In the rural areas, the percentage of literacy among males and females is 27.3 and 10.92% respectively. The literacy rate as per 1981 assessment works out to 29.94%. (The State income of the Andhra Pradesh at current prices increased from Rs.5842.8 million in 1955-56 to Rs.53012.8 million by 1978-79 recording nearly six fold increase. However, at constant prices (1960-61), the State income increased from Rs.8727.9 million in 1955-56 to Rs.18003.3 million in 1978-79 and the per capita income from Rs.259.60 to Rs.348.65 against the All India Average of Rs.400. According to the estimates of Planning Commission, 48.13% live below poverty line in the country and the corresponding percentage in the Andhra Pradesh is 42.18% based on projected census figures in 1977-78.

3. HEALTH ASPECTS

The vital statistics indicate the quality of achievements of various Health Programmes taken up by the Government.

The life span of males increased to 51.5 during 1976-80 from 37.8 in the Decade 1951-60. Similarly, the life span of females increased to 51.0 from 36.

The birth rate decreased from 39.7 in the Decade 1951-60 to 33.4 in 1978 and as per 1981 it is 33.6. The death rate declined rapidly in comparison to birth rate. The death rate decreased from 25.2 in the Decade 1951-60 to 13.2 in 1978 and also as per 1981. Infant mortality rate has come down to 113.3 per thousand live births in 1978 from 237 in 1951-60. The infant mortality rate as per 1981 assessment is 117.

In the beginning years of the formation of Andhra Pradesh the incidence of small-pox was very high. During the year 1957-58 alone, 14,059 attacks and 8,736 deaths were reported. Even though the State has achieved the target of Zero incidence of Small-pox, the vaccination programme is continued.

Malaria Control Measures were adopted in Andhra Pradesh in 1925 and in Telangana in 1939.

National Malaria Control Programme was launched in April 1953. The Malaria Eradication Programme, which was launched in 1958-59, brought down the number of positives to 22,866 in 1970 from over 70 lakhs prior to the inception of the programme. However, the incidence of Malaria was on the increase after 1970 which reached a maximum of 2.17 lakhs in 1976. The revised strategy implemented resulted in downing the number to 55,575 cases in 1979.

There are 13 districts in the State endemic to Cholera besides Hyderabad City i.e. 1) Srikakulam, 2) East Godavari, 3) West Godavari, 4) Krishna, 5) Guntur, 6) Prakasam, 7) Nellore, 8) Ananthapur, 9) Kurnool, 10) Guddaph, 11) Mahaboobnagar, 12) Nizamabad, and 13) Nalgonda. In order to check the disease Cholera control programme has been implemented during the IV Five Year Plan period and it has been continued.

National Filaria Control Programme was started in 1955-56 with 2 control units at Mandapeta and Nizamabad and one survey unit at Hyderabad. There was pilot projects covering a population of 3.0 lakhs.

In certain parts of the State in Nalgonda, Prakasham and Anantpur districts high flourine content in ground water is present.

4. WATER RESOURCES

The total annual availability of water in Andhra Pradesh is estimated at 110820 million cubic metres out of which 77720 million cubic metres are from surface water and 33,100 million cubic metres from ground water. However, the quantity available for exploitation still out of the above is 45,427 million cubic metres comprising of 22,327 million cubic metres of surface water and 23,100 million cubic metres of ground water.

Ground water is one of the most important and widely distributed sources in the state and its potential in the state has been estimated as 33,100 million cubic metres, out of which the present exploitation is of the order of 10,600 million cubic metres through mostly dug well and filter point wells leaving a balance of 23,100 million cubic metres as additional exploitable potential still. There are over 77,600 wells of various description in the state.

The ground water is not always potable and presence of fluorides beyond the permissible limits is one of the problems faced in the State. Nalgonda, Prakasham, Ananthapur and parts of other districts contain fluorides upto 20.5 milli grams per litre.

The two major river systems going through the state are the Godavari and Krishna which are accountable for about 84 per cent of the utilization of surface water in the state. The recorded peak discharge of river Godavari at Dhowleshwaram in East Godavari district, before entering into sea is 85,000 cumecs and that of Krishna at Vijayawada is 45,300. The river next important is the Penna river which contributes about 3¹/₂% of the surface water potential.

The Godavari which is the largest of the rivers in the state drains in the northern part and flows for about 720 K.M. in the state. The Godavari water is being intensively used for irrigation only in the delta below Rajahmundry.

In the case of Krishna river basin in the allocation available in Andhra Pradesh for usage including power generation water is 22972 M.cum. A quantity of 110.45 M.cum only has been allocated for the water supply requirements of the Twin Cities of Hyderabad and Secunderabad.

The Kolleru lake occupying 3.8% of the State area is the biggest fresh water lake in the state. It has gradually become brackish due to many streams like Budameru, Tammileru, Ramileru and Gunderu drain and other delatic drains like Pedapadu drain, Monadikodu drain, Thodapalli drain, Venkaiah drain and Sidhapuram drain. It covers an area of about 518 Sq.Km.

The other lakes in the state are Ramappa, Paka Cumbum, Kanigiri, Himayatsagar, Osmansagar Pocharam and Dindi. Some of the large canals are Jawahar canal, Lal Bahadur Sastry canal, K.C.Canal, Pennar and Nizamsagar

canal, Sriramsagar canal, Tungabhadra canals etc. Surface water reservoirs constructed exclusively for the purpose of drinking water supply are the Tatipudi Reservoir, and Mehadrigadda reservoir in Visakhapatnam Water Supply Scheme and Kalyani Reservoir scheme for Tirupathi. Osmansagar and Himayatsagar reservoirs which are sources of drinking water supply for the state capital are originally conceived as flood prevention measures also.

5. PRESENT STATUS OF WATER SUPPLY AND SANITATION

During the 5-year period, preceding the International Drinking Water Supply and Sanitation Decade, i.e. from 1975-76 to 1979-80, the total outlay for the water supply and sanitation sector was 731.329 Million, out of which Rs.372.815 Million was invested on Rural water supply and Rs.318.514 Million on urban water supply. The population benefitted was 4.782 Million in urban areas and 8.729 million in Rural areas. However, no sewerage scheme could be taken up during this period for want of adequate funds.

A population of 23.648 million (6.908 million in urban area and 16.71 million in rural area) are provided with drinking water supply facilities as on 31.3.81. But only 1.4 million are provided with sanitation, and there are no sanitation schemes in rural areas. During the decade, it is proposed to cover 100 per cent of the population of the state with protection water supply facilities and if this objective is to be achieved, protected water supply facilities have to be provided to 7.362 Million urban population and 28.982 Million rural population. The cost of providing protected drinking water supply schemes to the population of 36.344 Million by new facilities is estimated at Rs.6,285.535 Million. In addition it will be necessary to augment the rate of supply in several Municipalities as the present water supply would be inadequate. It is estimated that an amount of Rs.995.065 Million will be required for augmentation of water supply systems and the total outlay on water supply during the decade will be Rs.7281.600 million at 1979-80 prices.

62.51 per cent of the urban population and 41.5 per cent of rural population are provided with protected water supply as on 31.3.81 which work out to 46 per cent of the total population of the state. A population (27.732 million) do not have any water supply facilities as on 1.4.81. In addition, water supply to 5.433 million has to be augmented if the health of the community is to be safeguarded by provision of adequate protected water supply.

Only 2.72 per cent of the population of the state is served by sanitation facilities as on 31.3.81 and 9.615 million urban population and the entire rural population do not have any sanitary facilities as on 1.4.81. In order to achieve the targets of the decade 10.016 million of urban population and 11.43 million of rural population have to be provided with sanitary outlets with suitable disposal facilities including sewerage.

It has been observed that the per capita rates are higher in case of smaller communities and provision of water supply from ground water source is cheaper in general. The per capita costs vary from Rs.350/- in case of surface water supply for communities having a population of less than 100000 to Rs.195 in case of urban water supply schemes. The per capita cost of providing water to rural areas ranging from Rs.200/- to Rs.50/- and in case of rural sanitation schemes it is Rs.50/- and upto Rs.280/- in case of urban sanitation schemes. However, these costs are based on 1980 rates and subsequently there is spurt in costs of materials and labour and provision has to be made in the estimates for escalation in costs.

6. SECTOR ORGANISATION

The Chief agencies involved in the water supply and sanitation sector are the State P.H. & Municipal Engineering Department and the Panchayat Raj Engineering Department (Rural Water Supply Wing), which not only identify the projects but also prepare and execute the water supply and sanitation schemes. Metropolitan Board of Hyderabad is incharge of the project for identification as well as preparation, execution, operation and maintenance of the scheme, in the twin cities of Hyderabad and Secunderabad. The other water supply and sanitation schemes are maintained by the concerned local bodies (Municipalities and Panchayats).

The Department of Public Health Engineering and the Rural Water Supply Wing of Panchayat Raj Engineering Department have separate Chief Engineers who as the Heads of the Department. There is a separate post of Chief Engineer for Municipal Corporation of Hyderabad but he looks after the other developmental activities also of the Corporation including buildings, roads and bridges.

7. DECADE PLAN & TARGETS (POPULATION COVERAGE)

During the decade, it is proposed to cover by protected water supply facilities 207 urban communities having a population of 7.362 million at a cost of Rs.2004.935 million under new facilities.

As far as augmentation of urban water supply schemes is concerned, water supply in 71 urban communities having a population of 5.433 million require increase in per capita supply and the amount required for this purpose during the decade is 995.065 million.

It is proposed to provide sewerage systems in 15 Class-I towns and the total number of towns, 201 having a population of 10.016 Million will be provided with sanitary toilets and waste disposal facilities at a cost of Rs.2496.920 Million.

There is no proposal for augmentation in respect of urban sanitation except to cover the unserved population in Municipalities partly covered by sewerage.

28.982 Million people living in rural areas do not have protected water supply and it is proposed to cover the entire population during the Decade and the estimated cost is Rs.4281.6 Million. The population benefited by this programme during the decade is 28.982 Million.

8. DECADE PROGRAMME FUNDING

The total investment for the decade programme for drinking water supply and sanitation both in urban and rural areas will be Rs.10,350.02 Million at 1980 costs as summarised hereunder.

INTERNATIONAL DRINKING WATER SUPPLY & SANITATION DECADE (1-4-1981 to 31-3-1991 in respect of Andhra Pradesh)

Sl. No.	Description	Amount required in lakhs of rupees		
		P.H. Engg Department	P.R. Deptt	Total for the State
I WATER SUPPLY:				
(a) Urban Water Supply:				
	i) Mpl. Sector	Rs.26727.15	--	Rs.26727.15
	ii) Non-Mpl.Sector	--	Rs. 3272.85	3272.85
	Total Urban Water Supply (i+ii):	Rs.26727.15	Rs. 3272.85	Rs.30000.00
	(b) Rural W.Supply	--	42815.25	42816.00
	Total Water Supply (a+b):	Rs.26727.15	Rs.46088.10	Rs.72816.00
II.SANITATION:				
(a) Urban Sanitation:				
	i) Mpl.Sector	Rs.20734.70	--	Rs.20734.70
	ii) Non-Mpl.Sector	--	4234.50	4234.50
	Total Urban Sanitation (i+ii):	Rs.20734.70	Rs. 4234.50	Rs.24969.70
	(b) Rural Sanitation	--	5715.00	5715.00
	Total Sanitation (a+b):	Rs.20734.70	Rs. 9949.50	Rs.30684.20
I+II WATER SUPPLY & SANITATION:				
(a) Urban Water Supply & Sanitation:				
	i) Mpl.Sector	Rs.47461.85	--	Rs.47461.85
	ii) Non-Mpl.Sector	--	Rs. 7507.35	7507.35
	Total Urban Water Supply & Sanitation	Rs.47461.85	Rs. 7507.35	Rs.54969.20
	(b) Rural Water Supply and Sanitation	--	48531.00	48531.00
	III. GRAND TOTAL WATER SUPPLY & SANITATION FOR THE STATE	Rs.47461.85	Rs.56037.60	Rs.103500.20

The strategy for implementation of the decade programme is to step up the outlay progressively from year to year. Thus it is proposed to invest Rs.271 Million on water supply during the first year of the Decade (1981-1982) and the outlay will increase to Rs.973.90 million during 1990-91 which means a 4-fold increase in the investment. Similarly, in the case of sanitation an investment of Rs.22.0 million only is proposed during 1981-82 and it will be progressively increased to Rs.480.862 million in 1990-91. The investment for the decade programme will spread over to 4 years of 6th Five Year Plan, the entire 7th Five Year Plan and first year of 8th Five Year Plan.

Out of the provision of Rs.2219.1 million for this sector during VIth Five Year Plan including central sector allocation, Rs.1963.77 million are for implementation of Decade programme during 1981-85, Rs.1826.17 million for water supply and Rs.137.60 million for sanitation.

ANDHRA PRADESH

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

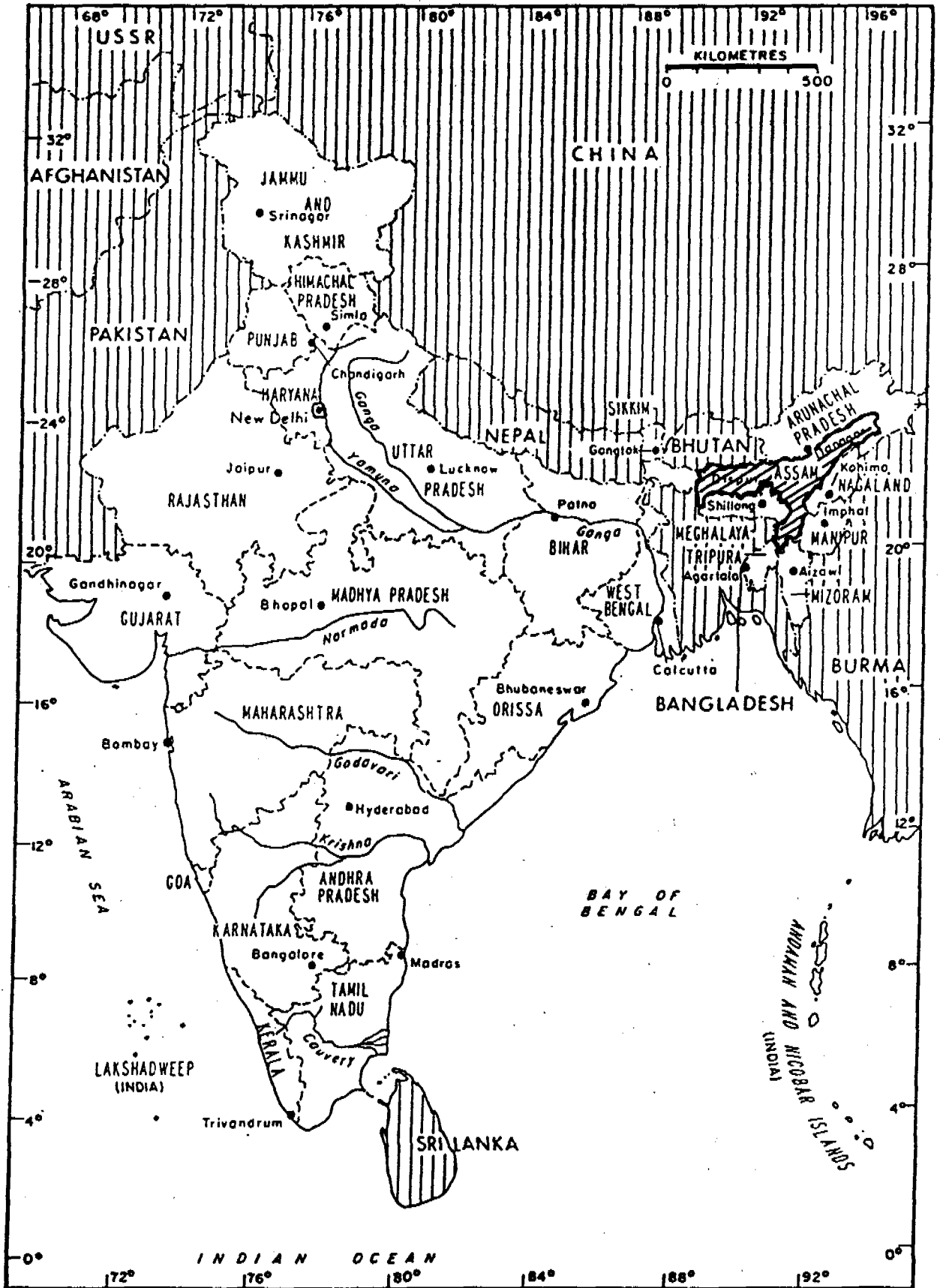
(Population and cost Rs. in thousand)

Year	Urban		Rural			
	Population to be covered	Capital cost to be utilised	Population to be covered		Capital cost to be utilised	
			RWS	RWC	RMS	RWC
1	2	3	4		5	
1981-82	28	93078	3396		168975	
1982-83	-	70674	2405		212250	
1983-84	188	140000	2091		333488	
1984-85	292	330203	3352		467560	
1985-86	285	307500	2300		401695	
1986-87	1198	382570	2530		441865	
1987-88	2445	409400	2782		486050	
1988-89	956	449000	3060		534665	
1989-90	799	436100	3366		588120	
1990-91	1171	403345	3700		646932	
Total	7362	3021870	28982		4281600	

SANITATION

1981-82	-	-	-	-
1982-83	-	1891	-	-
1983-84	-	7000	250	22700
1984-85	-	50654	500	57300
1985-86	123	222428	886	41500
1986-87	197	350505	1305	60000
1987-88	395	441554	1740	80000
1988-89	1454	514732	1959	90000
1989-90	3231	509219	2175	100000
1990-91	4616	398917	2615	120000
Total	10016	2496920	11438	571500

STATE OF ASSAM



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
ASSAM

1. INTRODUCTION

Assam is one of the easternmost States of India with an area of 78,253 sq.kms. (2.4% of India's territory) and population of 14.58 millions (1971 Census). It has 10 districts and the minimum average and highest densities are found to be below 150, 200 and 300 respectively per sq. km. The urban and rural population is 8.85% and 91.15% of the total population respectively (1971) and the growth rate is more than 3% per annum including both urban and rural.

50% of the area of the State is hilly; the temperature varies between 8°C to 35°C and the rainfall is high (average annual rainfall 1900 mm). The mighty river Brahmaputra, the river Barak and their tributories criss-cross the State and most of the plane areas are flood prone with high water table. Assam is in seismic Zone VI.

70% of the working population are employed in agriculture and allied professions. Irrigation facilities are inadequate. Industrially, Assam is still a backward State. The per capita income in 1975-76 is Rs.2.27 per day which is 75% of All India average. Literacy is 28.7% against all India average of 29.5%.

The cases of deaths due to various water born gastro-intestinal, endemic diseases are much higher in the state in comparison to all India average.

2. SOCIO-ECONOMIC INDICATORS

Total population of Assam as per 1971 Census is 14.587 millions. It is expected that the population will increase to 19.969 millions by the end of March 1981 and 26.820 millions by the end of 31.3.1991.

The economy of Assam is primarily based on agriculture which accounted for 56% of the State's income in 1976/77. Industry is less developed and is slowly increasing. The number of factories rose from 1484 in 1970-71 to only 1603 in 1975-76. The main industrial sectors are tea, oil, paper and food production. The population employed in industry accounted for 6% in 1970-71 and 7% in 1975-76. The net per capita income of Assam's population was Rs.1.75 per day in 1973-74 and Rs.2.27 per day (or Rs.816 per year) in 1976-77. This is only 75% of the All India average of Rs.1081 per year for the same period. The area devoted to agriculture covers about 32,000 sq. km. which is 40.5% of Assam's surface area (India 43%). Irrigation of agricultural land has recently been introduced, the irrigated area being negligible so far. The major agricultural crops are rice, jute and tea.

No authentic study is available based on which specific locations of urban and rural poverty groups can be identified.

About 70% of the working population are employed in agriculture and agriculture-allied subjects such as livestock, forestry, fishing, plantation etc.

3. HEALTH ASPECTS

- a. Life expectancy: As per family welfare year book life expectancy at birth of Assam assessed for 61-70 is for Male 53.6 and Female 49.01.
- b. Morbidity and mortality: The morbidity figures for the State for the year 1975-76 and 1976-77 are shown below:

Year	Total indoor and outdoor patients treated*	Estimated population of the State	Ratio of morbidity to population
1975-76	13,658,029	16,672,763	0.819:1
1976-77	13,689,417	17,072,673	0.802:1

The mortality rate per 1000 persons per annum in the last five year period (1977-1982)(averages) are as follows:

Rural	-	13.7
Urban	-	8.0
Combined	-	13.2

Nutrition programmes run by the State for school children expecting and convalescing mothers etc.

Endemic diseases: Although Cholera is controlled other gastrointestinal diseases, dysentery, new forms of Malaria and typhoid and various worm infestations like hookworm, guinea worms are still prevalent in various parts of the state. The cases and deaths due to Malaria alone in 1978, 1979 and 1980 are 80,073 and 30,297 and 58 and 44,308 and 40.

4. WATER RESOURCES

The estimated maximum surface runoff, economically and technically exploitable, is about 48,000 million m³ per year. This is about 7% of the total surface runoff. The present utilisation is about 1.5% of the total surface runoff.

The ground water potential is estimated as 14,000 million m³ per year and only about 0.02% of the total ground water potential has so far been utilised. Nearly in the 80% of the area of the State have been proposed for ground water study. Hydrological studies of about 60% of the area have been completed so far. The areas lying on the foot hill regions of different hill ranges of Assam are not easily exploitable for underground water. Elsewhere water is available at depths varying from 5 m to 200 m and beyond with yields ranging from 8m³/h to 240m³/h. The underground water contains excess iron and therefore not suitable for direct use in areas of the state. There is no single agency in the state which is responsible for the total control and management of the available water resources of the State. Number of agencies viz., Public Health Engineering Organisation, Municipal Administration Deptt., Municipal Corporation, Irrigation etc., are associated in various stages of implementation and maintenance. There is no legal and administrative arrangement for controlling the water use and extraction of ground water. It may be necessary to impose control on water use by sector and by services in the near future.

The geographical area of Assam falls under two river basins. Brahmaputra river basin is very vast. The specific yield of the Brahmaputra is highest in the world, being 0.033 Cum/sec per sq. km. However, as no scientific assessment has been made of the future regional water needs on a sufficiently long perspective, it is difficult to assert that the economically exploitable quantum of water of Brahmaputra basin, specially during the lean period, would remain sufficient to meet all future intrabasin needs in terms of irrigation for multi-cropping, municipal, rural and industrial water needs etc. and to maintain the minimum flow required in streams for dilution of pollutants.

Based on study by CGWB in 1977, 62,800 sq.kms. out of the total area of 78,323 sq.kms. of the State (i.e. about 80% area of the state is coverable for ground water study. An area of 43,120 sq.kms. have been covered by hydrological studies and the ground water potential have been estimated to be 13.959 million m³.

The population that can draw ground water sources is estimated to be 64.4% of the total, provided that the ground water quality is brought to the acceptable limit by necessary treatment.

5. THE PRESENT SITUATION WATER SUPPLY AND SEWERAGE

Out of 72 towns in the state only 11 are covered with protected water supply as on 1.4.1981. The population covered is 525 thousands out of a total 2400 thousands. The water supply is intermittent everywhere and the per capita supply varies between 45 to 136 lpcd. The urban population of the remaining 61 towns, not yet supplied with potable water depend on personal shallow tube wells, ponds, dug wells, community tanks and rivers. These sources are not at all free from pollution.

Out of a total of 21,995 inhabited villages of the state with a population of 13.3 million (1971), only 4606 villages and a population of 3.496 millions have been covered with water supply till 31.3.81 out of total projected population 17.569 million. 2.7% of the villages so far covered, have piped water supply with stand post and the rest have hand tube wells and dug wells. The per capita supply provision made is 40 litres per day for piped water supply schemes with stand-post and one hand tube well for every 150 souls.

The people of the villages, where no provision of safe drinking water is existing, consume water from ponds, streams, springs, kutchha wells and rivers which are not safe sources.

None of the 72 towns have any sewerage system (except 10,000 population of Karimganj where the scheme is under execution) or other sanitary method of disposal of excreta and waste water.

As on 31.3.81 hardly 12.54 per cent of the urban population are having sanitary means of night soil disposal arrangements either by means of individual spetic tank or low cost pour flush water seal latrine. Remaining vast population depends on bucket latrine or no latrine. The existing status of rural sanitation is not readily available from any record. Hardly 1% of the population, the wealthy villagers, have water seal latrines.

6. SECTOR ORGANISATION

The State Public Health Engineering Organisation under the Health and Family Welfare Department, is generally responsible for providing water supply in the State. The rural water supply programme is done mostly by them. The urban water supply schemes, which are the responsibilities of Municipal Corporation/Municipal Board/Town Committee of the towns are also implemented by PHEO on behalf of the MC/MB/TC. The Municipal Administration Department, the Panchayat Department and the Hill Areas Department are also concerned with the water supply sectors in certain areas and at certain stages. "Conversion of dry latrines into Sanitary Latrines with Septic tanks" - a programme of urban sanitation, is running for the last several years, under the Directorate of Municipal Administration. A new low cost water seal latrine programme, prepared by UNDP under the Global Project (GLO/78/006) to cover 15 project towns of Assam, is now under implementation through the Directorate of Municipal Administration. There was no well defined programme and fund for rural sanitation in the past, however, some allocation has been made in the Sixth Plan in the 1983-84.

The Assam State Housing Board, the Gauhati Municipal Corporation and the Municipal Boards/Town Committees, which are quasi-Govt. and autonomous organisations are also directly or indirectly responsible for the water supply and sanitation within their defined area.

For urban water supply, administrative sanction is given by Secretary MAD and the technical sanitation by Chief Engineer, PHEO. For rural water supply administrative sanction is obtained from the Secretary, H & F.W. Deptt., and the technical sanction from Chief Engineer, PHEO.

The work on urban sanitation is very insignificant and no definite pattern has been established. For low cost sanitation, the Secretary, MAD gives the administrative approval and the Director, Municipal Administration gives the technical approval through a technical cell under him.

Store purchase, setting of contracts are the responsibility of the department/agency, entrusted with the execution. PHE organisation does this job as far as rural and urban water supply schemes, executed by them. For Low Cost Sanitation (Urban) it is done by the Director, Municipal Administration.

7. DECADE PLAN TARGETS (POP. COVERAGE)

To achieve the Decade Targets, the population to be covered in the State of Assam during 1981-91, are set at figures given below:

	Total Coverage of Population (in '000)			No. of towns/villages to be covered during 1.4.81 to 31.3.91	
	During 1.4.81-31.3.91	By the end of 31.3.91	% cover- age	Towns	Village
	Urban Water Supply	2,629	3,154	100	61
Rural Water Supply	20,170	23,666	100		17,389
Urban Sanitation	2,222	2,523	80	37	
Rural Sanitation	5,741	5,917	25		21,995

8. DECADE PROGRAMME FUNDING

The 6th Five Year Plan outlay (1980-85) for the water supply and sanitation sector of Assam is shown below:

Sector	Allocation (Rs. in million)		Remarks
	State Plan	Total includ- ing central Assistance	
Urban Water Supply	140.00	144.50	Excluding pollu- tion Control Board allocation
Rural Water Supply	300.00	611.50	
Urban Sanitation	15.50	15.50	
Rural Sanitation	NIL	NIL	

The allocation constitutes 4.08% of the total provisions made for the State's 6th Five Year Plan provision.

The total fund requirement for meeting the decade target (1981-90) is estimated as follows:

Sectors	Total require- ments for the decade (1981-90) at 1980 prices (million)	Provision in 6th Plan State sector Central Sector (million)	Actual fund available for the decade programme within 6th Plan (81-85)	Provision for required for the remaining period.
Urban Water Supply	824.878	144.50	119.7	705.178
Rural Water Supply	3423.40	611.60	505.835	2917.565
Urban Sanitation	623.125	15.5	14.8	608.325
Rural Sanitation	287.05	NIL	NIL	287.05
Total	5158.453	771.50	640.335	4518.118

Part of the additional requirement for urban water supply may be available from L.I.C.I. against specific scheme. Schemes are being prepared for obtaining bilateral assistance and loan from the World Bank (IDA) etc. However, bulk of the requirement of fund will have to be made available to the State by increasing the allocation towards this sector by the Planning Commission, during the 7th Plan period, or even earlier, if the target is to be achieved. More central assistance is particularly needed for rural water supply and urban and rural sanitation. Water rates for urban water supply are to be so fixed that they ensure repayment of loans with interest as well as recovery of operation and maintenance cost and building up of a reserve fund. In the case of Rural Water Supply Scheme and Rural Sanitation the State Government will examine the viability of raising fund by stipulating minimum contribution by the beneficiaries.

Assam

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

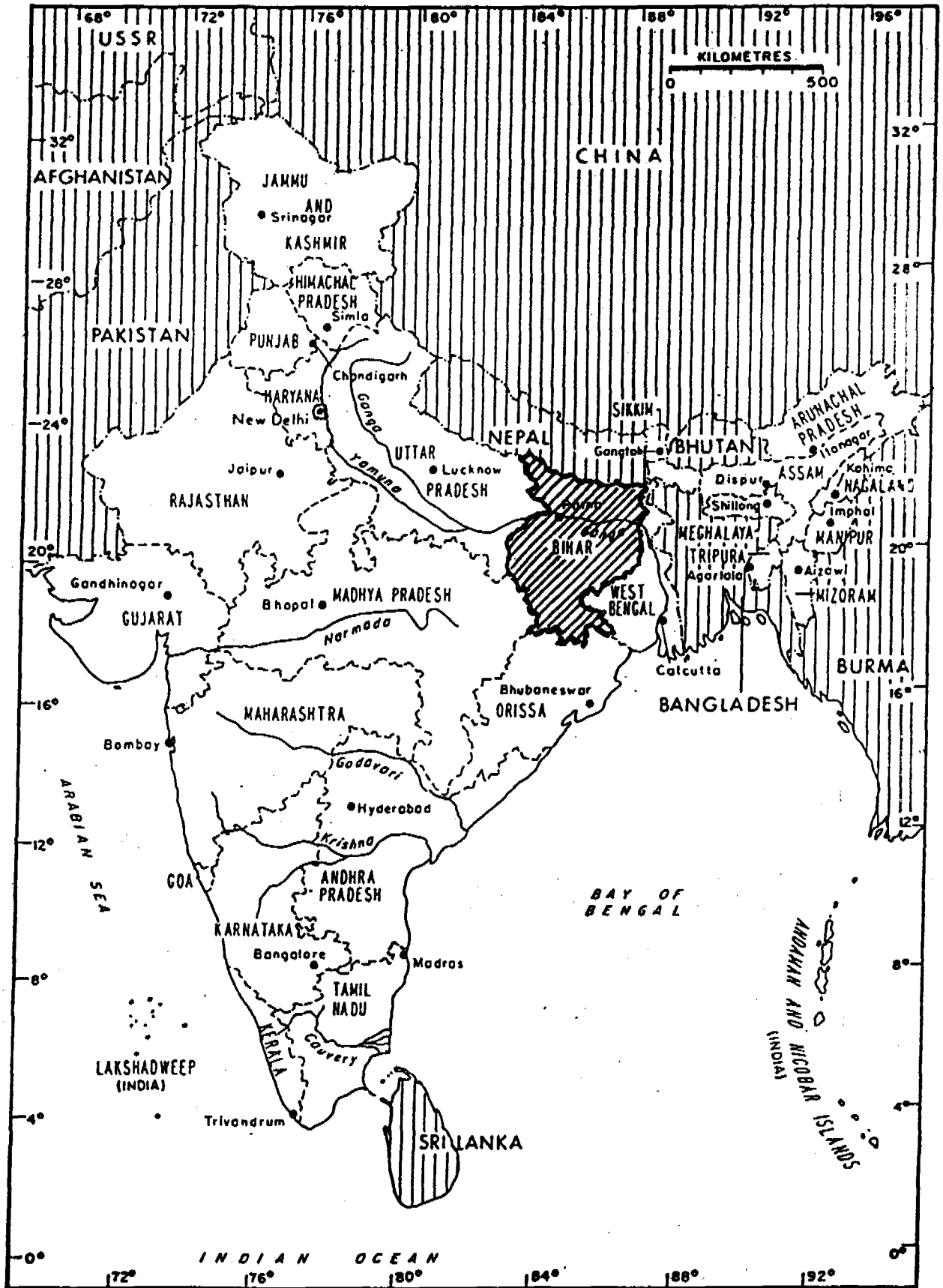
(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	50	18600	1324	119356
1982-83	70	18600	1459	150500
1983-84	90	36850	1229	168080
1984-85	187	45650	605	67899
1985-86	341	64200	2590	501100
1986-87	346	103450	2595	514600
1987-88	356	123100	2595	515600
1988-89	381	143400	2595	516100
1989-90	431	138000	2595	517600
1990-91	377	133028	2583	352565
Total	2629	824878	20170	3423400

SANITATION

1981-82	9	900	-	-
1982-83	36	4600	-	-
1983-84	36	4600	-	-
1984-85	36	4700	-	-
1985-86	164	89000	956	47000
1986-87	164	102880	956	48000
1987-88	164	105000	956	48000
1988-89	536	105540	956	48000
1989-90	536	105540	956	48050
1990-91	541	100365	961	48000
Total	2222	623125	5741	287050

STATE OF BIHAR



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR

BIHAR

1. INTRODUCTION

Bihar state is bounded by Nepal in North, Orissa in South, West Bengal in the East and Uttar Pradesh and Madhya Pradesh in the West. The State is covering an area of 1,73,700 square kilometers which is about 5.30 percent of the Indian territory.

2. SOCIO-ECONOMIC INDICATORS

According to 1971 census, the population of Bihar was 56.35 Million and the 1981 Census provisional figure since available is 69.8 Million. The projected population of the State as on 1.4.81 and 1.4.91 has been taken to be 68.25 and 79.99 millions as projected by the Registrar General of India. The average density of population in the State in 1971 was 324 persons per square kilometer which has increased to 402 in 1981 (Provisional) against the national average of 178 persons per square kilometer. The ratio of urban to rural population in 1971 census was 10 to 90. 1971 Census listed 202 towns with a total urban population of 5.60 Millions. The rural population of 50.75 Millions lived in 67,566 villages of the State. Each village is sub-divided into several hamlets on socio-economic-cultural considerations and sometimes are quite apart from each other. Per capita income in the State in 1974-75 was Rs.687.00 which has gone up to Rs.737 in 1980 which is about the lowest in the country.

According to the latest assessment by the Planning Commission, Government of India, the percentage of population below poverty line is 46.07% in urban and 58.91% in rural areas. Bihar is over-whelmingly agricultural with more than 80% of its workers employed on the land. Less than 3% of the work force is engaged in manufacturing industry, 7.1% working population of Bihar was engaged in secondary sector.

1981 Census has indicated the literacy rate of 26 percent against an all India average of 34.80 percent.

3. HEALTH ASPECTS

Vital statistics indicate birth and death rates of 31.3/1000 and 12.5/1000 and an infant mortality rate of 169. Life expectancy at birth increased from 38.2 in 1941-51 to 48.8 in 1980.

4. WATER RESOURCES

Bihar has most of the rainfall from the South West monsoon which sets in the first half of June and lasts till September. The general rainfall is 1200-1600 mm. The rainfall (90%) is concentrated during the monsoon months with a direct bearing on the discharge of most of the rivers which increases manifold during the wet season.

The State is blessed with abundant groundwater in the plains region ranging in depths from 30 metres to 2500 metres. The hard rock formations in the Chhotanagpur Plateau are compact and the potential for tubewells system development is very limited. Open wells with substantial percolation areas and infiltration surfaces have produced good yields in the area. Drilled tubewells for small community water supply are considered to be satisfactory.

5. PRESENT STATUS OF WATER SUPPLY AND SEWERAGE

Urban: By the end of March, 1981, 70.38 percent of the urban population (5.53 Million) was served with piped water supply. About 40% of the served population have house connections and the rest is served by public stand posts. Out of 202 listed towns (1971 Census), 158 have organised piped water supply and the remaining cater to their needs through open dug wells and handpump tubewells. In all the towns, the supply is intermittent and is made for 4-16 hours per day depending upon the various constraints in each of the towns. The existing pattern of Government contribution for Water Supply Projects is 25% of the estimated cost as grants-in-aid and the balance 75% as loan.

Rural: On 31.3.1981, 69.40% of the rural population of the State had access to drinking water supply. Only about 2% of the rural population has been covered with piped water supply mostly through standposts supply system. On the last day of March, 1981, out of 67,566 inhabited villages in the State, there were 12,534 problem villages which were to be provided with dependable drinking water sources.

The entire capital costs of all works in rural areas are borne by the State Government as grant. All the completed works are operated and maintained by the P.H.E.D. out of revenue budgets of the State Government as grant.

Water Supply continues to be considered more as a social infrastructure and welfare measure than a service to be paid for by the consumers. The concept of commercialisation of rural water supply system seems difficult to operationalise in the present socio-economic conditions with sizeable rural population of the State below poverty line.

Urban Sanitation: As on 31.3.81, 1,743,000 people were provided with sanitation facilities (22.2%), out of which about 9.2% were served by sewerage system and the remaining by low cost sanitation methods.

Rural Sanitation: At the beginning of the decade, 2,359,000 rural people (3.91%) were provided with safe sanitation facilities.

6. SECTOR ORGANISATION

State agencies involved in administration of Water Supply and Sanitation Sector include P.H.E.D. Urban Development Department, the Planning Department the State Water Pollution (Prevention and Control) Board, the State Public Health Laboratory, and the regional development authorities in Patna/Ranchi/Muzaffarpur. The State Government created the Bihar State Water and Sewage Board in March 1979. For the present, the Board has been entrusted with the work of preparation of Feasibility Reports for Water Supply proposed to be posed to IDA for financing.

7. DECADE PLAN TARGETS

Coverage proposals (Population in thousands) for urban as well as rural water supply and sanitation during the Decade are given below in the table.

(Population in 000's)

<u>Sector</u>	<u>Water Supply</u>		<u>Sanitation</u>
	(New)	(Aug.)	
Urban	2326	+ 2624	6633
Rural		27606	15022

8. DECADE PROGRAMME FUNDING

The total investment at 1980 level of cost for the Decade Master Plan Programme works out to be Rs.703.2798 thousand as detailed below:

(Cost Rs. in thousands)

Description	Water Supply			Sanitation		
	Urban	Rural	Total	Urban	Rural	Total
New facilities	634200	3515180	4149380	1581290	751100	2332390
Augmentation	551029	-	551028	-	-	-

The outlay for Water Supply and Sanitation (1980-85) in the State Sector is Rs.100.14 crores.

The indicated Central allocation for A.R.P. for the Sixth Five Year Plan period is Rs.30.625 crores. Out of these outlays the amounts utilised for the first year of the plan i.e. 1980-81 in Rural Water Supply Sector were Rs.13.50 crores and Rs.9.65 crores under MNP and ARP respectively. The expenditure under urban water supply and sanitation (1980-81) was Rs.3.30 crores. Therefore, the provision left for the last four years of the plan 1981-85 is Rs.104.315 crores for the first four years of the Decade. The total cost of the programme for these four years (1981-85) is Rs.104.315 crores at 1980 price levels. The plan provisions therefore, practically cover the requirements at 1980 price levels.

The size of the Development Plan of the State (1980-85) i.e. the Sixth Five Year Plan has been agreed as Rs.3,225 crores. Out of this, Rs.100.14 crores has been agreed upon for water supply and sanitation sector. This is about 3.10% of the State Plan.

9. SUPPORT PROGRAMMES

Manpower planning as well as training will have to be undertaken in advance for successful implementation of the Decade Plan and realisation of the goals.

Some critical materials like pipes, cement, pumps, M.S. rounds etc. are in short supply. The matter has already been taken up at the national level and the situations are likely to improve.

Systems for data collection and monitoring have to be improved during the Decade period.

The following programmes are being implemented in the State which are expected to act as complementary inputs to the Decade Programme:

- i) Nutrition Programme
- ii) Integrated Rural/Urban Development Programme
- iii) Health Education Programme
- iv) Food for Work Programme

BIHAR

INTERNATIONAL DRINKING WATER SUPPLY & SANITATION

DECADE, 1981-90

Annual Phasing of Decade Programme

WATER SUPPLY

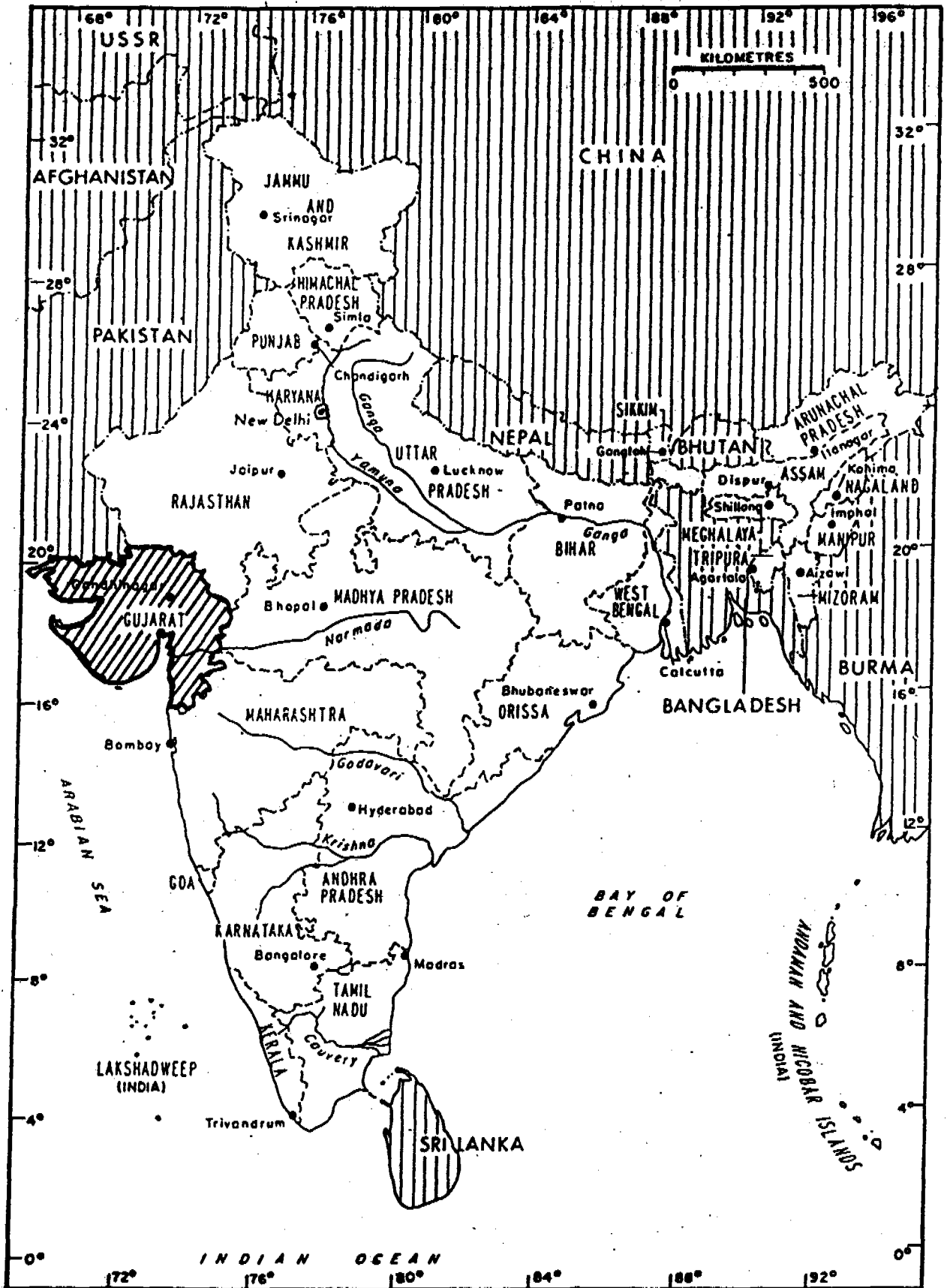
(Population & cost (Rs.) in thousands)

Year	URBAN		RURAL		
	Population to covered New	Aug	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2		3	4	5
1981-82	120	140	33 000	3 550	233 020
1982-83	196	200	22 400	3 600	192 600
1983-84	133	140	47 500	3 984	220 000
1984-85	140	150	71 700	4 000	179 100
1985-86	300	315	168 400	2 078	460 000
1986-87	300	315	168 400	2 078	460 000
1987-88	300	323	168 400	2 078	460 000
1988-89	300	324	168 500	2 080	460 000
1989-90	300	323	168 500	2 080	430 344
1990-91	237	394	168 428	2 078	420 116
Total	2 326	2 624	1 185 228	27 606	3 515 180

SANITATION

1981-82	46	11 000	-	-
1982-83	15	3 500	-	-
1983-84	31	7 300	-	-
1984-85	46	11 030	-	-
1985-86	1 082	258 020	2 400	120 000
1986-87	1 082	258 050	2 600	130 000
1987-88	1 082	258 050	2 500	125 000
1988-89	1 082	258 050	2 500	125 000
1989-90	1 082	258 050	2 500	125 000
1990-91	1 085	258 240	2 522	126 100
Total	6 633	1 581 290	15 022	751 100

STATE OF GUJARAT



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
GUJARAT

1. INTRODUCTION

Gujarat State is situated on the west coast of India. The boundaries of the State are Arabian Sea on the west, Pakistan on the north, Rajasthan on the north east, Madhya Pradesh in the east and south east and Maharashtra in the south. It covers an area of 187091 square kilometres which is 5.7% of the Indian territory.

The climate of Gujarat is sub-humid to arid with maximum temperature of 46° C and minimum temperature of 40° C. The average annual rainfall in the past 20 years is in the range from 33 mm in the District of Kutch to 1520 mm in the District of Dangs. However, extreme years can reduce the rainfall to 20% of the above figures as in 1972 or can double it as in 1976.

The State of Gujarat can be divided into three major physiographical groups as follows:-

- 1) Alluvial saline tract extending from Kutch and Banaskantha in the north to deep Black Cotton soil at Bulsar in the South.
- 2) Hilly and rocky tract covering eastern parts of the Gujarat State and major parts of Saurashtra and a portion of Kutch.
- 3) Semi-arid and arid saline regions in the North and North west, including parts of Kutch and Saurashtra.

The State divides naturally into three geographical units. The Gujarat mainland, Saurashtra Peninsula and Kutch. The Gujarat mainland comprises alluvial plains flanked by hilly terrain in the east and Arabian Sea in west. The land slopes gently towards the west and south west and is traversed by the State's five rivers. (Tapi, Narmada, Mahi, Sabarmati and Banas) and numerous small streams, and a long sea coast.

The Kutch district is an arid zone and occupies about 25% area of

Gujarat State. Banaskantha and Mehsana district, in north Gujarat and all districts of Saurashtra are scarcity prone area. There is a problem of salinity ingress long as the coastal area which is 1600 kms long.

2. SOCIOECONOMIC INDICATORS

The 1981 census operations in the State have been completed and the demographic report has been published. The population of the State was 26.64 million in 1971. The projected population of 1981 is 33.05 million. The decennial population growth rate during 1971 to 1981 has been 24.06%. The total number of towns as per 1981 census comes to 255 as against 218 of 1971 census. The projected population in 1991 is 39.47 millions.

Gujarat is on the way towards urbanisation. In India Maharashtra with urban population of 35.03 per cent ranges first amongst all States, followed by Tamil Nadu with 32.98 per cent and Gujarat with 31.08 per cent stands third. In 1971 also, Gujarat ranked third in urbanisation.

Gujarat's economy is primarily based on agriculture which accounts for 40% of the State income. After the second five year plan, industry has been rapidly growing in Gujarat. After Punjab and Maharashtra, Gujarat ranks third as far as employment in industry is concerned.

The State has made good progress in several sectors continuously since 1960-61. The production base has been strengthened, infrastructure facilities have been considerably expanded and the coverage of essential services has been widened within the ambit of available resources. The growth rate of 3.3 per cent was achieved during the third five year plan period (1961-66). The progress of the economy during the fourth five year plan was better with growth rate of 5%. The incidence of poverty is the highest (75%) in the eastern hilly areas and the least (32%) in the Saurashtra region.

The national economy had a long term growth of 3.5% per annum during the last three decades; Gujarat's economy also has had a long term growth of 3.5% per annum during the last two decades but with a difference while there has been acceleration at the national level, the State economy had accelerated from 2.8% per annum in 40's to 4% per annum in 70's an increase of about 46%.

Per Capita income per annum

One of the basic objective of planning in India has been to increase the level of per capita income per annum which reflects the standards of living of the masses. The per capita income of Gujarat at constant prices has increased from Rs.680 in 1960-61 to Rs.865 in 1980-81. The per capita income of Gujarat in 1981-82 is 950 which is higher by about 9.8%.

3. HEALTH STATISTICS

The high incidence of diseases in some of the rural areas is directly attributable to the high salt content in existing water sources. Due to non existence of scientific collection and disposal of human wastes in many parts of the State, the potential sources of disease pervade both urban and rural communities and in particular the urban slum areas. The State Health and Family Welfare Department has maintained records of water borne diseases.

4. WATER RESOURCES

There are only three perennial rivers in Gujarat namely Narmada, Tapi and Mahi all located in south of the State and the non perennial river Sabarmati flows through the district of Sabarkantha, Mehsana and Ahmedabad. Their average annual discharge is as follows:-

Narmada	...	18.0 millions M ³
Mahi	...	8.6 millions M ³
Sabarmati	...	3.2 millions M ³
Tapi	...	18.0 millions M ³

In the Saurashtra area the Bhadar with a length of 260 kms. Shetrunji with a length of 160 kms. Machhu with a length of 110 kms flows non perennial.

Ground Water

The capricious nature of rain fall had made certain areas of the State extremely susceptible to drought and famine conditions. Ground water conditions vary in relation to hydrological setting. At present substantial quantity of ground water is being extracted to support irrigation, industry and drinking water supply requirement. Out of total area of 155984 square kms, an area of 33481 square kms is suitable for exploration of ground water potential. The total ground water recharge in the State is 3844 million M³. The ground water development in the State so far is prominent in areas where depth of aquifers (100-200 mts) and static water level (10-40 mts) are not excessive and where discharge level are 1150-2500 L.P.M. and T.D.S. levels are with 1000 to 3000 P.P.M. sometimes even more.

The total surface water resources of the State excluding the Narmada basin are estimated at 46050 million M³, of which the utilisable water resources are only 15360 million M³. As per the Narmada water tribunal, the State has been allocated the utilisable quantum of 11101.32 cubic million. Thus the total utilisable water resources will be 26461.3 million cubic metres.

The investigations have revealed that ground water is very limited in the peninsular region of Saurashtra and Kutch. In the alluvial area of north Gujarat underground water can be tapped under varying conditions and at varying depths. Deep tubewells are sunk upto 500 Ms. The ground water contain total dissolved solids from 200 to 2500 mg. per litre in these areas.

5. PRESENT SITUATION OF WATER SUPPLY AND SEWERAGE

Urban Water Supply

Out of the 255 towns as per 1981 census, 164 towns have been covered with drinking water supply. Five towns been covered under augmentation of urban water supply schemes. The total coverage of urban population with water supply as on 31.3.1981 is 9427 thousands.

Rural Water Supply

There are 18275 villages in the State. Out of this, 9038 villages had been identified as problem villages upto 1980. 3952 villages have been provided with drinking water supply covering a population 16257 thousands upto 1.4.1981. Thus 5086 villages are to be covered during the decade out of 1980 list and many more are added to No Source category subsequently. The number of problem villages is increasing due to peculiar geohydrological situation of the State. This number has reached well over 12500, and has an increasing trend due to (a) depletion of ground water, (b) salinity ingress and (c) industrial pollution effects. Thus additional about 7120 villages will need drinking water supply during the decade, so as to achieve the decade target of providing water to all. Thus the coverage of population for the urban as well as rural sector as on 31 March 1981 in terms of population is 25684 thousands.

Urban Sanitation

19 towns plus 4 corporations cities have been covered under sewerage schemes as on 31 March 1981. The population benefitted with sanitation facilities as on 31 March 1981 is as under:-

Urban population	...	4368 thousands
Rural population	...	<u>53 thousands</u>
Total		<u>4421 thousands</u>

The programme of rural sanitation is implemented on as and when basis and upto the end of 1981-82, five villages have been covered with drainage facilities. A population of 53,600 has been covered so far with rural sanitation.

6. SECTOR ORGANISATION

The subjects of water supply, sanitation and prevention and control of water pollution are under Health and Family Welfare Department for administration purposes.

With the exception of Municipal Corporations, the responsibility for the planning, designing and construction of the water supply and sewerage systems for the whole of the State of Gujarat rests with the Gujarat Water Supply and Sewerage Board (GWSSB). GWSSB was established on 20 August 1979. The entire functions of the water supply and sanitation services in Gujarat were vested in GWSSB with effect from 1 April 1981. As a general principle GWSSB will finance, execute and commission projects but hand them over to the local bodies for operation and maintenance. However, with effect from 1 June 1983 the operation and maintenance of rural regional water supply scheme has been entrusted to GWSSB by Government of Gujarat.

The municipal corporations act independently in planning, design, construction, operation, maintenance, financing, dealing and collecting for their systems. They may, however, make use of the services of the GWSSB at their own discretion.

The municipalities and individual village panchayats in rural areas normally take over the systems after commissioning and GWSSB is fully reimbursed by local contribution and by Government of Gujarat grant for the construction costs and its services.

7. DECADE PLAN TARGETS (POPULATION COVERAGE)

It has been proposed to cover population in Gujarat with water supply and sanitation services as under:-

A) Water Supply

Urban population	(1) New facilities 3253 thousands
	(2) Augmentation 6651 thousands
Rural population	10535 thousands

B) Sanitation

Urban population	5776 thousands
Rural population	6645 thousands

8. DECADE PROGRAMME FUNDING

The requirements of funds to achieve the decade goals has been estimated as under, as per 1980 prices.

a) Urban water supply	Rs.1472.3 million
b) Rural water supply	Rs.1591.9 million
c) Urban sanitation	Rs.2316.4 million
d) Rural sanitation	Rs. 332.3 million
Total	<u>Rs.5712.9 million</u>

The total requirements of funds amount to Rs.5712.9 million has been worked out on 1980 prices.

Mobilisation of resources

The requirement of funds for the decade plan has been estimated as 5712.9 million at 1980 prices. The State Sixth Five Year Plan provides a total outlay of Rs.1507.6 millions under the State sector plus Rs.115.25 million under the Central Sector (ARP) totalling to Rs.1622.85 million. This includes the market borrowing and the funding by LIC and also the IDA and other credits.

The resources of the State Government are limited. The State has to provide funds for other development works also. It would be necessary to generate additional funds under the State as well as the Central Sector to meet with the requirements of the decade. This can be done by increase in the allocations under the accelerated rural programme, tapping of bilateral and multilateral assistance for the project.

9. SUPPORT PROGRAMMES

To meet the requirement of funds, it is necessary that increased allocations are made under the State as well as the central sector outlays.

As regards the manpower constraints the essential input is training of personnel. GWSSB has therefore decided to establish a Central Training Institute under the IDA credit. This institute will provide facilities to train the personnel involved in planning, services in the State.

As regards the operation and the maintenance, the regional water supply schemes are entrusted to GWSSB with effect from 1 June 1983. The Government of Gujarat has decided to provide funds for the efficient operation and maintenance of rural schemes, partially through contribution from the beneficiaries and partially aided by the State Government.

GUJARAT

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

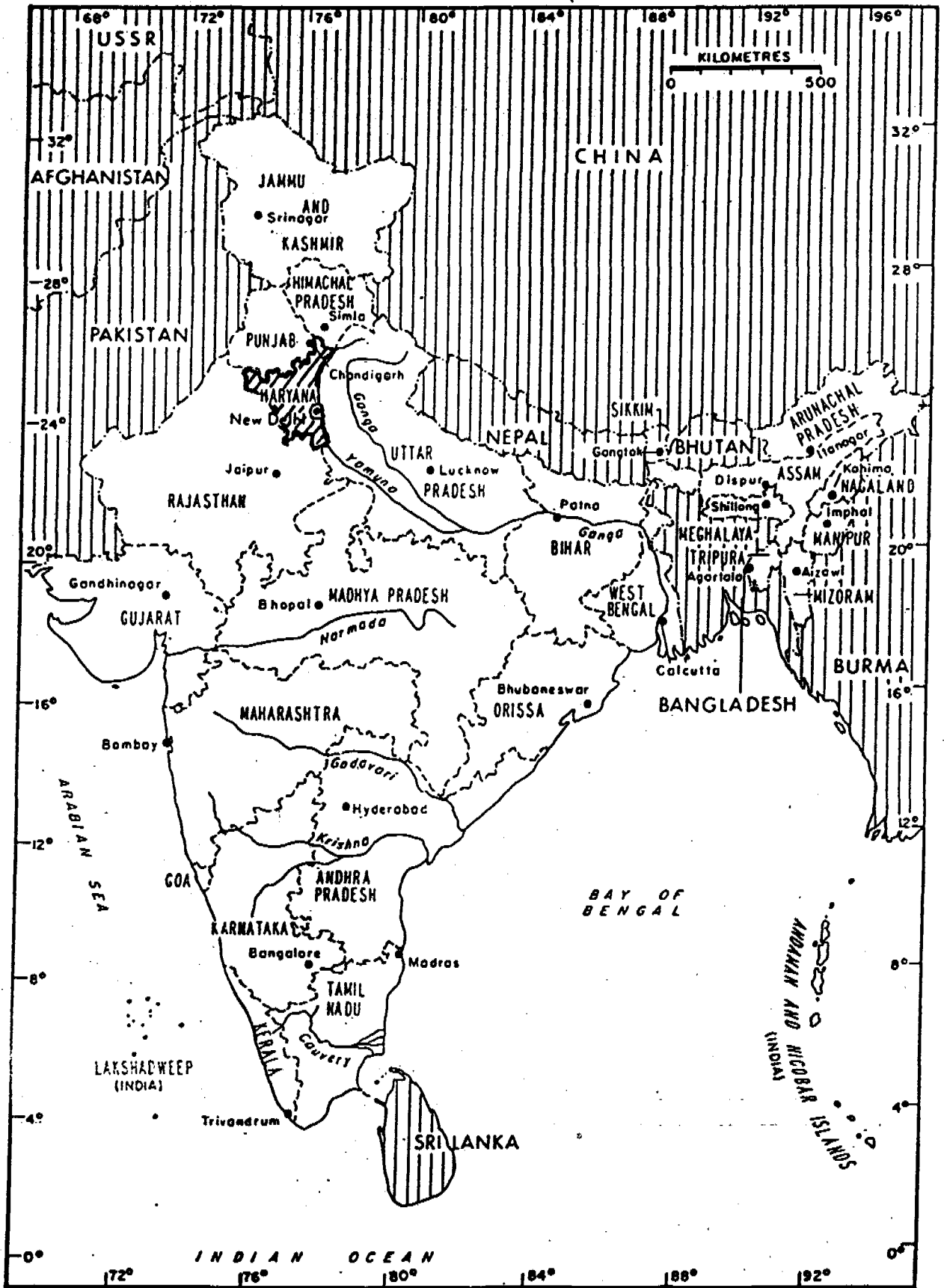
(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	346	61800	930	149000
1982-83	351	99750	1190	195000
1983-84	897	119900	4020	354600
1984-85	718	155350	2765	262300
1985-86	1543	150000	2855	354600
1986-87	957	170000	4270	372300
1987-88	931	19000	3125	348100
1988-89	1897	100000	2060	194200
1989-90	1020	210000	-	-
1990-91	1244	245463	-	-
Total	9904	1472263	21215	2230100

SANITATION

1981-82	908	52300	1	50
1982-83	432	184400	10	500
1983-84	1202	196100	15	750
1984-85	683	218000	20	1000
1985-86	400	259000	800	40000
1986-87	547	269000	1000	50000
1987-88	440	279000	1100	55000
1988-89	345	287000	1200	60000
1989-90	177	306700	1200	60000
1990-91	642	265945	1299	64950
Total	5776	2316445	6645	332250

STATE OF HARYANA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
HARYANA

1. INTRODUCTION

Haryana State came into existence only in 1966. It was a part of composite Punjab State previously. Prior to 1947, the water supply & sanitation was not given any importance. Regular piped water supply existed only in 3 towns and sewerage facilities did not exist in any of the towns now situated in Haryana State. In 1954 with the help of Govt. of India, a National water supply and sanitation programme was launched under which loans on liberal terms were arranged for Municipalities in Urban Areas and in some deserving cases grant-in-aid was also given to them. Later on, the Life Insurance Corporation of India came in to advance loans for drinking water supply schemes to the local bodies. In Rural Areas the Panchayat which were the counterparts of Local Bodies in towns, could raise no resources of their own. They were given subsidy by the Central Government and grant-in-aid by the State Govt.

Haryana has an area of 44,212 sq.kms. It lies in the Indo-Gangetic plain with an elevation of 200 to 350 M above MSL except for some hills of Shiwalik system in the North and of Aravalli system in the South.

2. SOCIO-ECONOMIC INDICATORS

Population of the state as per 1971 census was 100.37 lacs (urban 17.73 and rural 82.64). The projected figures of 1981 population are 124.82 lacs (urban 23.92 & rural 100.90). However, the provisional figures of 1981 census is 128.51 lacs. The projected population figures of 1991 are 150.97 lacs (urban 31.40 and rural 119.57)

As per 1971 census, there were 65 towns and 6731 villages in the state.

As per 1971 census, percentage of literacy in Haryana was 26.89. This has improved to 35.84% according to the provisional figures of 1981 census. Literacy among the males (47.8%) and in urban areas is higher than among females (22.2%) and in rural areas.

Average annual per capita income in the state is Rs. 1867, being the third highest in the country, the first being Punjab (Rs. 2361/-) and the second Maharashtra (Rs. 1903/-)

3. HEALTH ASPECTS

Life Expectancy: Expectancy of life in Haryana during the years from 1976 to 1980 was 54.4 years for males and 53.4 years for females.

Morbidity & Mortality: The health statistics of the state have been given in the table below:

Year	Birth rate per 1000 persons		Death rate per 1000 persons	
	Urban	Rural	Urban	Rural
1971	27	32	6	7
1976	29	26	8	8
1981	28	24	7	7

Endemic Diseases: Cholera, Malaria, Filariasis, Leprosy, etc. are quite rampant in the State. In 1979 there have been respectively 651, 405274, 2575 and 509 cases of these four diseases.

4. WATER RESOURCES

On the east side, River Yamuna, which is the only perennial river in the State forms the boundary between Haryana and U.P.. River Ghaggar passes through the Western parts of the State. Bhakra & Western Jamuna Canal system make the net-work of canals in the State.

The State Irrigation Department is being requested to include the drinking water supply schemes as integral parts of their projects and is being urged to provide the inlet channel upto water works free of cost as part of their project. They are also being requested to supply raw water free of cost for rural and small Urban Water Supply Schemes and in case of large Urban Projects to charge for raw water as per irrigation rates.

5. PRESENT STATUS OF W.S. & SEWERAGE

In Urban areas, partial water supply has been given to 69 towns as on 31.3.81 covering a population of 11.28 lac persons. By partial water supply is meant lower supply rate of 45 to 90 l.p.c.d. against the desired water supply norms for the towns. There are 4690 villages identified as problem villages, out of which 1250 villages were covered with water supply upto 31.3.1980 leaving a balance of 3440 problem villages as on 1.4.1980. Upto 31st March 1981, 1576 problem villages with a population of 27.57 lacs

have been provided with water supply mostly @ 45 l.p.c.d. & a part of it @ 25 l.p.c.d.

Partial sewerage plus low cost sanitation facilities to 32 towns covering a population of 3.47 lac persons has been provided upto 31.3.1981.

There was no rural sanitation upto 31.3.81. This sub-sector has not been paid much attention so far.

6. SECTOR ORGANIZATION - PHED

Responsibility for providing water supply and sewerage in various towns of the State rests with the concerned local bodies but the works of water supply and sewerage in towns are done by State Public Health Engineering Department, which is a part of State P.W.D., as deposit works on behalf of the local bodies. Maintenance of water supply and sewerage schemes in most of the towns is also done by the PHED on behalf of the local bodies. In Rural Areas, both execution and maintenance is done by the Public Health Engineering Department. State Government gives grant-in-aid upto 88% of the cost and rest 12% is contributed by the beneficiary Panchayats in the shape of land, labour and cash. The maintenance cost of Rural Water Supply Schemes is fully borne by the Panchayat in its budget.

Haryana Urban Development Authority (HUDA) established in 1977, is responsible for all development works such as planning design and execution of water supply schemes, sewerage and drainage schemes.

The State Sanitary Board accords administrative approval and allocates funds for all urban & rural water supply and sanitation projects in the State. The Board consists of 7 Ministers and 12 officials. The Superintending Engineer (Planning) of the PWD, Public Health is the Member-Secretary of the Board.

7. DECADE PLAN & TARGETS

The physical achievement and financial investments are given as under:

	URBAN			RURAL		
	No. of towns covered with W/S	No. of towns covered with sewerage	Investment on W/S & sewerage (in crores)	No. of villages covered with W/S	No. of Villages covered with sanitat-ion	Investment on W/S (In crores)
4th Plan (1969-74)	23	8	6.425	456	-	8.422
5th Plan (1974-79/79-80)	5	6	13.744	653	-	22.854
6th Plan (1st 2 years - i.e. 1980-82)	3	3	6.722	585	-	30.593

As on 31.3.81, 47.16% of Urban population has been covered with partial water supply schemes, yet the quantity of water supply is inadequate in some of the cases. Similarly in Rural Areas, about 27.3% of population has been provided with drinking water supply upto March, 1981. In Urban Areas 14.5% population has been provided with partial sewerage and low-cost sanitation facilities upto 31.3.1981. There is practically no rural sanitation in the State.

Target Population for the Decade

Population coverage during the Decade by 31.3.1985 and targetted population coverage by 31.3.91 are estimated as under: (figures in lacs)

	<u>By 31.3.85</u>	<u>By 31.3.91</u>
a. Urban Water Supply	4.45	20.12
b. Rural Water Supply	32.65	92.00
c. Urban Sanitation	2.92	21.65
d. Rural Sanitation	0.98	29.90

8. DECADE PROGRAMME FUNDING

Total requirement of funds estimated at 1980 price level, to achieve the desired targets works out to be about Rs. 360/- crores. The bifurcation is as under:

Urban Water Supply	Rs. 68.89 crores
Rural Water Supply	Rs. 225.16 crores
Urban Sewerage & Sanitation	Rs. 50.93 crores
Rural Sanitation	Rs. 14.95 crores
Total:	Rs. 359.93 crores
Say	<u>Rs. 360.00 crores</u>

Against the requirement of funds for the Decade Programme amounting to Rs. 360 crores, the provision during 1981-85 (Phase I) is Rs. 100.98 crores. Thus the requirement of funds to be provided in the Seventh Plan and 1st year of Eighth Plan will be Rs. 259 crores. Escalation in the costs is bound to increase the requirement of funds further. For this, the additional internal as well as the external resources will have to be tapped to achieve the goals of the Decade Programme.

The Plan outlays for the water supply and sanitation sector should be stepped up.

The State Govt. is examining the issue to see that water rates are so fixed that these ensure the repayment of loans with interest as well as recovery of operation and maintenance cost and provision for building up of a reserve fund. Surpluses from Urban Water Supply Schemes or from supplies made for industrial and commercial purposes shall be utilised as cross subsidy to sewerage schemes and rural water supply schemes.

Active participation of the Urban Local Bodies shall be ensured. At present the Local Bodies are contributing 5% of the costs of the project from their own resources. Efforts shall be made to enhance this contribution upto 10 to 15% after examining the financial position of the Urban Bodies.

Similarly in case of rural water supply schemes, the Panchayats are urged to contribute at least the O & M cost and enhance their cash component to 10%. At present, it is 7% in shape of land and labour and 5% in cash.

The State Government shall examine the possibility of raising the additional resources for water supply and sewerage schemes during the Decade Programme by imposing a special purpose-cess as a surcharge on selected taxes like land revenue, Sales Tax, Passenger tax, Motor Vehicle Tax, etc. which shall be exclusively utilised for water supply and sanitation schemes. The matter is under consideration and shall be examined by the State Apex Committee.

9. The annual phasing of the programme during the Decade period is indicated in the enclosed table.

HARYANA

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

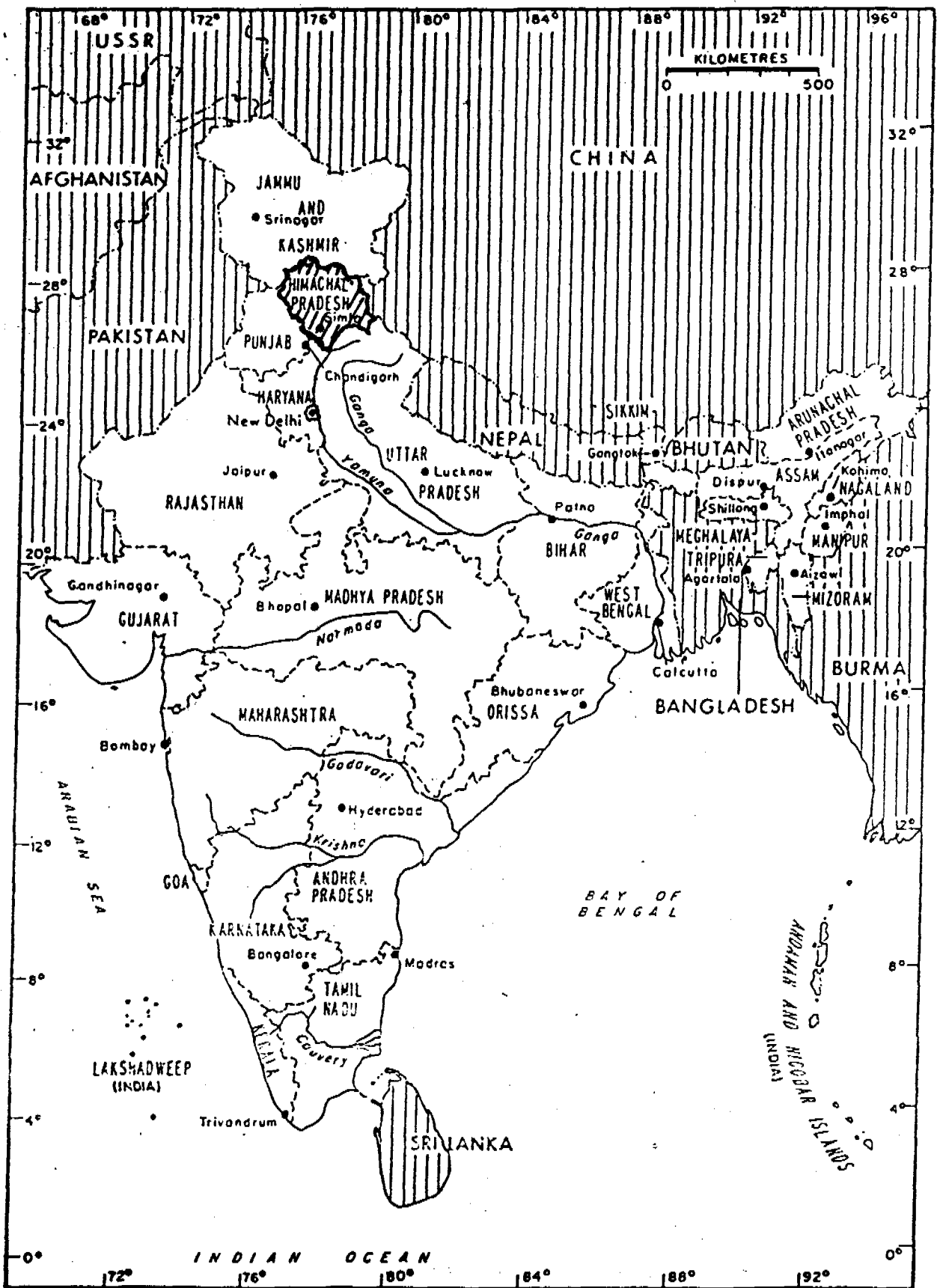
(Population and cost Rs. in thousand)

Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	66	22760	621	172975
1982-83	92	31300	640	169600
1983-84	119	40900	695	184000
1984-85	168	57669	1309	256771
1985-86	261	89379	989	244715
1986-87	261	89379	989	244715
1987-88	261	89379	989	244715
1988-89	261	89379	989	244715
1989-90	261	89379	989	244715
1990-91	262	89381	990	244719
Total	2012	608905	9200	2251640

SANITATION

1981-82	65	15144	6	300
1982-83	65	15350	7	300
1983-84	77	18290	8	300
1984-85	85	20000	77	4100
1985-86	312	73421	482	24083
1986-87	312	73421	482	24083
1987-88	312	73421	482	24083
1988-89	312	73421	482	24083
1989-90	312	73421	482	24083
1990-91	312	73421	482	24083
Total	2165	509310	2990	149500

STATE OF HIMACHAL PRADESH



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
HIMACHAL PRADESH

1. INTRODUCTION

Provision of safe drinking water to rural and urban population has been going on since beginning of Five Year Plans but the progress was slow due to inadequate financial provisions. Practically all the surface water sources which did not require costly treatment were tapped and sources which are quite far away and down below the villages have been left.

Himachal Pradesh is a hilly state having an area of 55673 square kilometres and altitude varying from 400 to 4500 metres above MSL. It is bounded by Tibet in the East; Jammu and Kashmir in the North, Punjab and Haryana in the west and U.P. in the South.

2. SOCIO-ECONOMIC INDICATORS

Population

Total Population	...	34.54 lacs (1971 census)
Population of 1981 (projected)	...	42.28 lacs
Projected population of 1991	...	49.96 lacs

Out of the state total population of 42.28 lacs 38.92 lacs or 92.05% is rural residing in remote and hilly areas. The urban population in the State is only 3.36 lacs or 7.95% residing in 36 small towns.

Income

Per capita annual income in the State is Rs.1317. Agriculture is the main occupation of the rural people and provides direct employment to about 70.64% of the total working population. Population below the poverty line is 27.3%, the maximum being scheduled castes and people residing in the tribal areas of Kinnaur, Lahaul and Spiti and Pangti and

Bharmour Tehsil of District Chamba. There are 7.69 lacs scheduled castes scattered over the state which is about 22.24% of the total population.

Literacy

The percentage of literate people is about 32. In respect of technical education there are two polytechnics one at Sundernagar and another at Hamirpur.

3. HEALTH ASPECTS

Uptodate data is not available but data for deaths from various causes for some past years is as under:-

<u>Causes</u>	<u>Year(1973)</u>	<u>Year(1974)</u>
Fevers	9409	7810
Dysentery and Diarrohea	2645	3506
All other causes	9859	8695

Birth rate, death rate and Infant mortality is given as under:-

<u>Year</u>	<u>Birth Rate</u>	<u>Death Rate</u>	<u>Infant Mortality</u>
1974	34.9	12.3	99.8
1975(P)	32.7	13.2	114.86
1976(P)	32.5	13.5	121.92

4. WATER RESOURCES

The Central Ground Water Board has already made the survey for exploring ground water resources in eight districts out of the twelve districts of the state and have worked out a tentative figure of 678 MCM utilizable resources of ground water out of which 162 MCM is net draft and potential available for future development is 470 MCM. There are a number of spring sources available which can be tapped for supplying potable water. In plain valleys of Paonta, Una, Balh and Nurpur etc. where the water is available at lower depths the possibility of exploring ground water resources is in abundance. The topography of the state being hilly and mountaneous most of the surface water flows down to the plain area.

5. PRESENT STATUS OF WATER SUPPLY AND SEWERAGE

Urban Water Supply Schemes

There are 36 towns in the State with a population of 2.41 lacs as per 1971 census (as per 1981 census there are 46 towns). Out of these 36 towns works of augmentation in 19 towns with a population of

1.86 lacs have been initiated. So far upto March 1983, two schemes have been completed. The designed per capita supply ranges from 40 litres per day to 70 litres. These schemes require immediate augmentation and it is proposed to augment at the rate of 70 to 200 litres per capita per day. As on 31 March 1981, 3.25 lac population has been benefitted with safe water supply facility.

Rural Water Supply Schemes

There are 16916 villages in Himachal Pradesh with a population of 32.18 lacs as per 1971 census. These villages are scattered and are situated in valleys and on ridges. There are few individual sources of water supply for each village. Most of the schemes are covering groups of villages with per capita water supply at 40 litres per day for lift schemes and 70 litres per day per capita for gravity schemes. Upto the end of March 1981, 7887 villages with a population of 18.04 lacs had been provided with safe drinking water supply and the balance of 9029 villages were proposed to be covered in the Decade Plan. Uptodate coverage i.e. upto 31.3.1983 was 10787 villages out of which 6688 villages are problem villages and 4099 are easy villages and thus balance for coverage as on 1.4.1983 is 4449 problem villages and 1680 easy villages.

Urban Sanitation

There is no sewerage in any of the towns in Himachal Pradesh which are served mainly by conservancy system. Sanitary facilities are available only in a few modern office and residential/hotel buildings. Estimates for Chamba, Dharamsala, Hamirpur and Mandi have been finalized. The estimate of Mandi amounting to Rs.114.85 lacs has been sent to the Government of India for approval. As on 31.3.1981 45000 population has been benefitted by sanitation facilities.

Rural Sanitation

Sanitation facilities do not exist in the rural areas. Due to high altitude and heavy snowfall people face hardships and there is lot of difficulty in disposal of human waste. It is proposed to provide individual low cost sanitary waterseal pour flush latrines to 11.38 lacs population i.e. to 25% of the population during the Decade in rural areas.

6. SECTOR ORGANISATION

The State Public Works Department with Chief Engineer, Irrigation and Public Health is responsible for execution of Water Supply and Sanitation schemes for urban as well as rural areas as well as their maintenance except in certain cases where Municipal Committees have taken over maintenance and revenue recoveries.

There are eight Superintending Engineers responsible for investigation, survey, execution and operation and maintenance of water supply and sanitation schemes. For investigation of schemes there are three Investigation Divisions. In every circle there is one Executive Engineer(Design).

7. DECADE PROGRAMME 1981-1990

The planwise physical and financial achievements and proposals during the decade period are as follows. This includes Rural Water Supply, Urban Water Supply, Urban Sanitation and Rural Sanitation)

Financial

Total requirement of funds for the decade	...	Rs116.77 crores
Sixth Plan outlay -		
State Sector	...	Rs50.00 crores
Central Sector (ARWSP)	...	Rs12.00 crores
Anticipated additional expenditure likely to be incurred during 1983-85	...	Rs19.11 crores
Therefore total Sixth Plan expenditure(anticipated)	...	Rs81.11 crores
However actual expenditure during 1980-81	...	Rs13.11 crores
Therefore fund that will be made available during 1981-85 (anticipated)	...	Rs68.00 crores
Resources required to be made available during the Seventh Plan and first year of the Eighth Plan(1985-91)	...	Rs48.77 crores

Physical Targets

Total villages in the State	...	16916
Villages left out without watersupply as on 1.4.81	...	9029
Coverage during 1981-85	...	8 lacs population
Coverage during 1985-91	...	19.46 lacs population

Urban Water Supply

Total number of towns	...	36
Population to be covered -		
during 1981-85	...	0.37 lacs
during 1985-91	...	0.84 lacs

Urban Sanitation

During the decade five towns will be covered.

Population to be covered -

during 1981-85	...	0.16 lacs
during 1985-91	...	2.96 lacs

Rural Sanitation

Population to be covered -

during 1981-85	...	nil
during 1985-91	...	11.38 lacs

The Government of Himachal Pradesh has accepted the sector targets proposed by the Government of India and have accordingly set the following targets.

Urban Water Supply

It is proposed to complete the augmentation of water supply schemes in all big towns and to cover 1.21 lacs new population and 3.25 lacs augmentation population with an expenditure of Rs.11.25 crores. With the existing water supply facilities and that provided during the decade plan coverage will be 100 per cent.

Rural Water Supply

The Government of Himachal Pradesh has accepted the target in principle and has decided to provide water supply facilities to all the 16916 villages during the Decade Plan and thus the coverage will be 100 per cent.

Urban Sewerage and Sanitation

There is no Class I town in the State. However, the only Class II town i.e. Simla, the capital of the State will be covered under this programme. It is proposed to provide sanitation facilities to 3.12 lacs population with a capital cost of Rs.8.51 crores (at 1980 price level). About 80% population will be covered.

Rural Sanitation

As per the targets fixed by the country, it is proposed to cover 25% of the population by providing individual sanitary flush latrines in the rural areas covering 11.38 lacs population with a capital cost of Rs.5.70 crores

8. DECADE FUNDS REQUIREMENT

The position of the funds required in the Decade, sub-sector wise is as under:-

<u>S.No.</u>	<u>Sub-sector</u>	<u>Requirement (Rs. in crores)</u>
1.	Urban Water Supply	11.25
2.	Rural Water Supply	91.31
3.	Urban Sanitation	8.51
4.	Rural Sanitation	5.70
		<u>116.77*</u>
		say 117 crores

(* based on 1980 price level)

The resources required for the Seventh Five Year Plan and first year of the Eighth Five Year Plan will be as under:- (at price level of 1980)

<u>S.No.</u>	<u>Plan Period</u>	<u>Available Resources(Rs. in lacs)</u>
1.	1985-90	4083
2.	1990-91	794

New Measures

The following measures would be taken to pool up the resources:-

- (i) The State P.W.D.(IPH) should be converted into a board as in some other states. This will facilitate the taking of loans from other agencies like L.I.C., HUDCO etc.
- (ii) There should be income tax exemption for those firms which voluntarily execute the water supply schemes at their own cost.
- (iii) The revenue collected from taxes such as tax on fruits, agriculture products, road tax, other municipal taxes should be diverted to this sector.
- (iv) The rural population can be educated for adopting modern sanitation system. Faster progress can be achieved by provision of a subsidy by the Government to supplement the efforts of the individual in the construction of flush latrines.

External Resources

A project amounting to Rs.15.55 crores has already been approved under EEC programme. Another project costing Rs.50 lacs has been approved for assistance by the Dutch Government. These projects will be completed during the decade period.

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9. SUPPORT PROGRAMMES

Inter-Sectoral Coordination

Some minor irrigation schemes are serving as sources of drinking water supply as well. The small hamlets of villages are being covered by diverting the irrigation canal water for drinking purpose. There is no contribution of voluntary agencies and special services organisations etc. in this sector.

Community Participation and Health Education

There is not much participation by the community. However, the facilities of the health services are extended by the medical department working under the Director of Health Services of the State.

Control and Monitoring

The progress reports are received in the office of the Chief Engineer. Monitoring meeting is held under the chairmanship of the Chief Secretary of the State in the first week of every month to monitor the progress made under 20-point programme which includes Rural Water Supply and Sanitation Programme. The quarterly progress is monitored and discussed in the meeting under the chairmanship of the Chief Minister of the State.

Phasing of the Decade Programme

Annual phasing of the decade programme (tentative) (1981-91) is as per the enclosed table (see next page)

HIMACHAL PRADESH

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE 1981-90
ANNUAL PHASING OF DECADE PROGRAMME

WATER SUPPLY

(Population and cost Rs. in thousand)

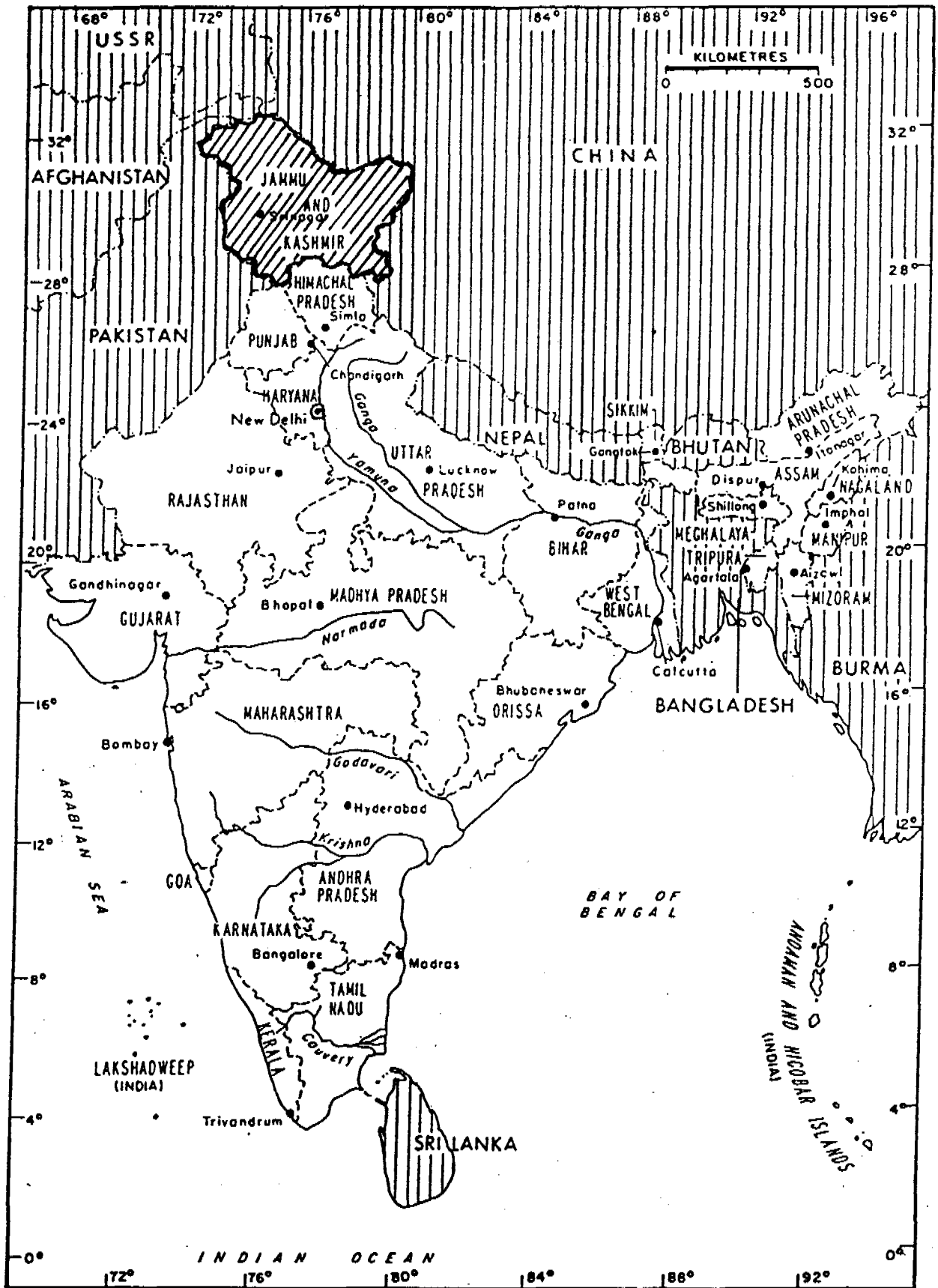
Year	Urban		Rural	
	Population to be covered	Capital cost to be utilised	Population to be covered	Capital cost to be utilised
1	2	3	4	5
1981-82	5	8924	300	156937
1982-83	10	2700	200	116074
1983-84	10	5000	200	173500
1984-85	12	33799	100	173500
1985-86	12	10000	400	50000
1986-87	15	11000	300	50000
1987-88	15	11000	400	50000
1988-89	15	10000	300	50000
1989-90	15	10000	300	50000
1990-91	12	10077	246	43054
Total	121	112500	2746	913065

SANITATION

1981-82	-	477	-	-
1982-83	-	3000	-	-
1983-84	-	3000	-	-
1984-85	16	3135	-	-
1985-86	20	8000	110	6800
1986-87	35	11000	160	8000
1987-88	40	13000	180	10000
1988-89	60	14000	180	10000
1989-90	80	15388	250	10000
1990-91	61	14125	258	12100
Total	312	85125	1138	56900

Note: Under RWS an outlay of Rs.42.25 crores(MNP) and Rs.12 crores under ARP has been provided for 1980-85. During first three years of the plan an amount of Rs.74.71 crores has been spent. To cover the target an additional amount of Rs.19.11 crores will be needed during the Sixth Plan. With this additional funds we will be left with only 2849 problem villages and 1530 easy villages as on 1.4.1985 to be covered during 1985-91.

STATE OF JAMMU & KASHMIR



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
JAMMU & KASHMIR

1. INTRODUCTION

Provision of drinking water supply facilities in the State had almost remained a completely neglected sphere of development prior to Independence. Till then, such facilities were extended in a skeleton form only to the capital cities of Srinagar and Jammu apart from some towns of tourist and religious importance. It was only with the beginning of the Fifth Five Year Plan i.e., 1974-75 onwards, that the Drinking Water Supply was recognised as a priority sector of development in the State and received considerable impetus and emphasis. Sanitation has remained neglected till date due to serious financial constraints.

Jammu & Kashmir State is the northern-most border State of India situated in the Western Himalayas with the following distinct physical regions:-

Ladakh: Ladakh region, the largest of the three regions, is a rugged mountaneous terrain characterised by towering peaks, steep valleys and wide stone and dust deserts with a drainage basin called the Indus. The highest mountain peaks rise to 7500 Metres above mean sea-level (MSL). Average annual rainfall in Leh is 115 mms.

Kashmir: The region has an average altitude of 1700 Metres above MSL and is bordered in the south and west by the Pirpanchal range and to the north and east, by the Great Himalayan foothills. River Jhelum traverses through the valley including the city of Srinagar, the summer capital of the State. The region has an average annual rainfall of 664 mms.

Jammu: The Jammu region lies to the south of the Himalayan belt with the Punjab plains in its south extending into it at an average elevation of 365 metres above MSL. The average annual rainfall in the region is 1148 mms.

2. SOCIO-ECONOMIC INDICATORS

As per 1971 census, the region-wise distribution of villages and population is tabulated as under:

Region	U R B A N		R U R A L		Total Population (lacs)
	No. of towns	Population in lacs.	No. of villages	Population in lacs	
i. Kashmir	17	5.63	2,940	18.72	24.35
ii. Jammu	26	2.87	3,540	17.80	20.67
iii. Ladakh	2	0.80	238	0.97	1.05
Total	45	8.58	6,718	37.49	46.07

Out of the total number of 6,718 villages, only 500 villages (200 in the Kashmir Valley and 300 in the Jammu region) were identified as 'Non-Problem' villages in the State.

The projected population for 1981 and 1991 is as follows:

	(figure in lacs)	
	<u>1981</u>	<u>1991</u>
a) Urban population	12.23	16.94
b) Rural population	47.59	58.56
Total	<u>59.82</u>	<u>75.50</u>

Income: Per capita income has been estimated at Rs. 1439.00 per year for the year 1980-81. 34.1% of the population is below the poverty line.

The State is economically backward, more than 75% of its area being hilly and much of it without communication facilities. There are only 6 kms of roads per 100 sq. km. area in the State as against 36 km. for All India.

Literacy: With availability of free education all over the State, literacy is picking up as would be evident from the following table:

	<u>Overall</u>	<u>Male</u>	<u>Female</u>
1971	18.58%	26.75%	9.28%
1981	26.17%	35.49%	15.82%

Literacy percentage is lower in the rural areas than in the urban areas.

3. HEALTH ASPECTS

Life Expectancy: The position in respect of the State is as under:

<u>Year</u>	<u>Expectation of life at birth (national figure)</u>
1961-70	45.6 years
1971-80	54.0 -do-

Morbidity and Mortality: While detailed upto date statistics are not available, certain areas of the State, having poor environmental sanitation conditions, have been facing high incidence of diseases like, typhoid, infective-hepatitis, dysentery, diahorrea, (Gastro-enteritis), etc.

The mortality figures in respect of the following years give an idea of the toll taken by some of the water and faecal borne diseases:-

<u>Year</u>	<u>Cause of Death</u>	<u>Total Deats</u>		
		<u>Urban</u>	<u>Rural</u>	<u>Total</u>
1976	Dysentry, Diarrhoea (Gastro-Enteritis including cholera)	101	1374	1475
1977	-do-	69	765	834
1978	-do-	69	833	902
1979	-do-	50	596	646

4. WATER RESOURCES

The State has no doubt tremendous surface water resources but unfortunately, these have not been harnessed to their optimum capacity, mainly because of the financial constraints. Rivers and lakes are mostly fed from streams springing from snow and glacier areas of the Himalayas and to the casual observer in summer, it would appear that the State has an over-abundance of good quality surface water and thus few water supply problems. In other areas such as the Kandi belt in Jammu, the Karewa belt in Kashmir and certain high altitude areas of all the three regions, surface water sources are either negligible or confined to deep gorges.

From 1968 onwards, the ground water division of the Geology and Mining Department, has conducted preliminary surveys in respect of ground water in some areas besides making an effort to develop quantitative and qualitative data on ground water resources with the assistance of the local unit of the Central Ground Water Board (CGWB) of the Government of India. The hydro-geological data has not been, however, compiled in detail so far.

Our past experience has shown that ground water available in the Jammu region is of good quality as the same is obtained from boulder aquifer. In contrast, the hydro-geological formations in most parts of the Kashmir valley comprise of peaty and marshy matter which, in turn, impart taste and odour problems to ground water besides its association with high degree of methane gas and iron content.

As on 1.4.1981, the region-wise break-up of the tubewells constructed in the State is as under:

<u>Sl.No.</u>	<u>Region</u>	<u>Total No. of productive/exploratory wells drilled</u>
1.	Kashmir	61
2.	Jammu	175
3.	Ladakh	2
	Total:	<u>238</u>

5. PRESENT STATUS OF WATER SUPPLY AND SEWERAGE

The position of coverage as on 1.4.1981 is summarised as under:

Urban Water Supply

While water supply facilities have been extended to all the 45 towns many of our urban communities hardly get satisfactory and adequate drinking water supply which varies from 40 litres to 100 litres per capita per day. Even in the city of Srinagar, there are a number of shortage zones where the water is being presently supplied through tankers. Large increase in urban population has imposed a serious strain on the existing systems, which accordingly need constant and extensive upgrading, improvement, augmentation and extension during the Decade period. As on 31.3.1981, 1,223,000 urban population benefitted from safe water supply, 65% of which were served by house connections.

Rural Water Supply

i)	In terms of number of villages covered ending 3/81	1903 out of 6,718 or 28.32%
ii)	In terms of population benefitted ending 3/81	36.4% or 1,733,000

(Many of our existing rural water supply systems are also in need of upgrading/improvements/augmentation).

The per capita supply ranges from 40 to 70 litres per day. 95% of the rural areas are served through public stand posts while hardly 5% population have house connections.

Urban Sanitation

There is no centralised sewerage system in any city including the two capital class I cities of Srinagar and Jammu. Sewage of all types finds direct access into the surface drains and low lying areas, thus polluting our water bodies and posing a serious health hazard to the community.

There are, however, some house-holds especially in the newly developed urban areas which have sanitary latrines connected to septic tanks with or without soakage pits. Such households hardly constitute 8% of our urban population.

Rural Sanitation

Nothing has been done in this regard in the State so far.

6. SECTOR ORGANISATION

The Secretary, Public Works Department of the State Government is incharge of engineering departments including Public Health Engineering in which there are two Chief Engineers, one for Jammu Province and another for Kashmir and Ladakh. They are responsible for project formulation, construction, operation and maintenance as also revenue recovery in the Urban Water Supply and Rural Water Supply & Sanitation sectors. The sub-sector of Urban Sanitation is looked after by the Urban Environmental Engineering Department created in 1979, which will give due priority and emphasis to sewerage schemes for the cities of Srinagar and Jammu.

7. DECADE PLAN & TARGETS

The sub-sectorwise target population, to be served during the Decade, is given hereunder:

Sub-Sector	Target population by 31.3.1985 (Phase I)	Target Population by ending 31.3.1991
(Figures in thousands)		
(i) Urban Water Supply	100	471
(ii) Rural Water Supply	1 131	4 123
(iii) Urban Sanitation	100	1 257
(iv) Rural Sanitation	100	1 464

8. DECADE PROGRAMME FUNDING

The estimated investments, based on 1980 price index for the targetted coverage with proposed service levels and stated unit costs, are summed up as under:-

	<u>Rs. in crores</u>						
	<u>Water Supply</u>			<u>Sanitation</u>			<u>Grand Total</u>
	<u>Urban</u>	<u>Rural</u>	<u>Sub-Total</u>	<u>Urban</u>	<u>Rural</u>	<u>Sub-Total</u>	
Decade Plan Requirements (1981-90)	64.66	167.97	232.63	84.99	7.32	92.31	324.94
Allocation for Sixth Development Plan (1980-85)	29.90	43.40	73.30	8.00	1.60	9.60	82.90

Out of this, an amount of Rs. 17.80 crores has already been spent during the first year (1980-81) of the Sixth Five Year Plan leaving Rs. 65.10 crores (Rs. 82.90 crores minus Rs. 17.80 crores) for the remaining four years of the Plan which coincide with Phase I of the Decade Programme.

Apart from this Rs. 33.75 crores have been promised by the Government of India under their Accelerated Rural Water Supply Programme (ARWSP) during the plan period, of which Rs. 3.13 crores stand expended during the year 1980-81.

The possible sources for bridging the gap in resources would be:-

- i) By enhancement of 6th Plan allocations adequately say at least by 40% Say Rs. 32.00 crores
- ii) Earmarking substantial allocations during the 7th Five Year Plan (say 100% increase over the 6th Plan figures) Say Rs. 166.00 crores
- iii) Supplementing grants under the Accelerated Rural Water Supply Programme. Say Rs. 31.22 crores.

The State Government would also sponsor schemes for bilateral and multilateral assistance to augment available resources.

9. SUPPORT PROGRAMMES

Apart from the financial constraints that may be expected in implementing the Decade Programme, the following constraints are visualised:-

Manpower Development and Training

There is an imperative need to build up a cadre of trained personnel in the field of Public Health Engineering right from the grass root level and a separate cadre for Public Health Engineers.

Operation and Maintenance

Since all the water supply systems are being operated and maintained by the Government, regular training for the operational staff will be arranged for effective maintenance.

Management and Administration

In order to have a unified control on the sector services, there is need for setting up a "Water Supply and Sewerage Board". This would also facilitate obtaining and funneling of financial assistance from internal and external funding agencies.

A draft bill for the purpose is presently under the consideration of the State Government.

Materials and Equipment

While there is not much problem towards procurement of materials at present, regular supplies of key materials like cement and steel and critical stores will have to be ensured as the Decade Progresses.

Monitoring

For effective implementation of the Decade Programme, two state level committees are proposed to be set up: (i) An Apex Committee headed by Chief Minister or Minister of Works and Housing and (ii) An Action Committee under the chairmanship of the Commissioner-cum-Secretary of Public Works Department.

The following further supportive projects have been identified:

- i) Tariff studies for water and waste water
- ii) Provision for laboratory services
- iii) Quality control measures including water testing and monitoring facilities
- iv) Health Education Inputs
- v) Establishment of effective Information systems.

JAMMU AND KASHMIR STATE

International Drinking Water Supply and Sanitation Decade 1981-90

Annual Phasing of Decade Programme

(Population and cost (Rs) in thousands)

A. WATER SUPPLY

Year	Urban		Rural	
	Popln. to be covered	Capital cost to be utilised	Popln. to be covered	Capital cost to be utilized
1	2	3	4	5
1981-82	-	39,800	227	1,68,200
1982-83	-	70,000	254	1,85,000
1983-84	50	70,000	300	1,50,000
1984-85	50	65,900	350	1,08,300
1985-86	80	74,000	450	1,80,000
1986-87	80	65,000	550	1,80,000
1987-88	70	65,000	600	2,05,000
1988-89	70	65,000	600	2,05,000
1989-90	50	65,000	550	1,80,000
1990-91	21	66,900	242	1,18,200
Total:	471	6,46,600	4,123	16,79,723

B. SANITATION

1981-82	-	10,000	-	1,000
1982-83	-	15,000	25	1,000
1983-84	-	20,000	30	5,000
1984-85	100	30,000	45	6,000
1985-86	120	80,000	200	10,000
1986-87	130	1,40,000	200	12,000
1987-88	230	1,40,000	250	12,000
1988-89	240	1,40,000	250	9,000
1989-90	240	1,40,000	250	7,200
1990-91	197	1,34,990	214	7,000

Total: 1,257

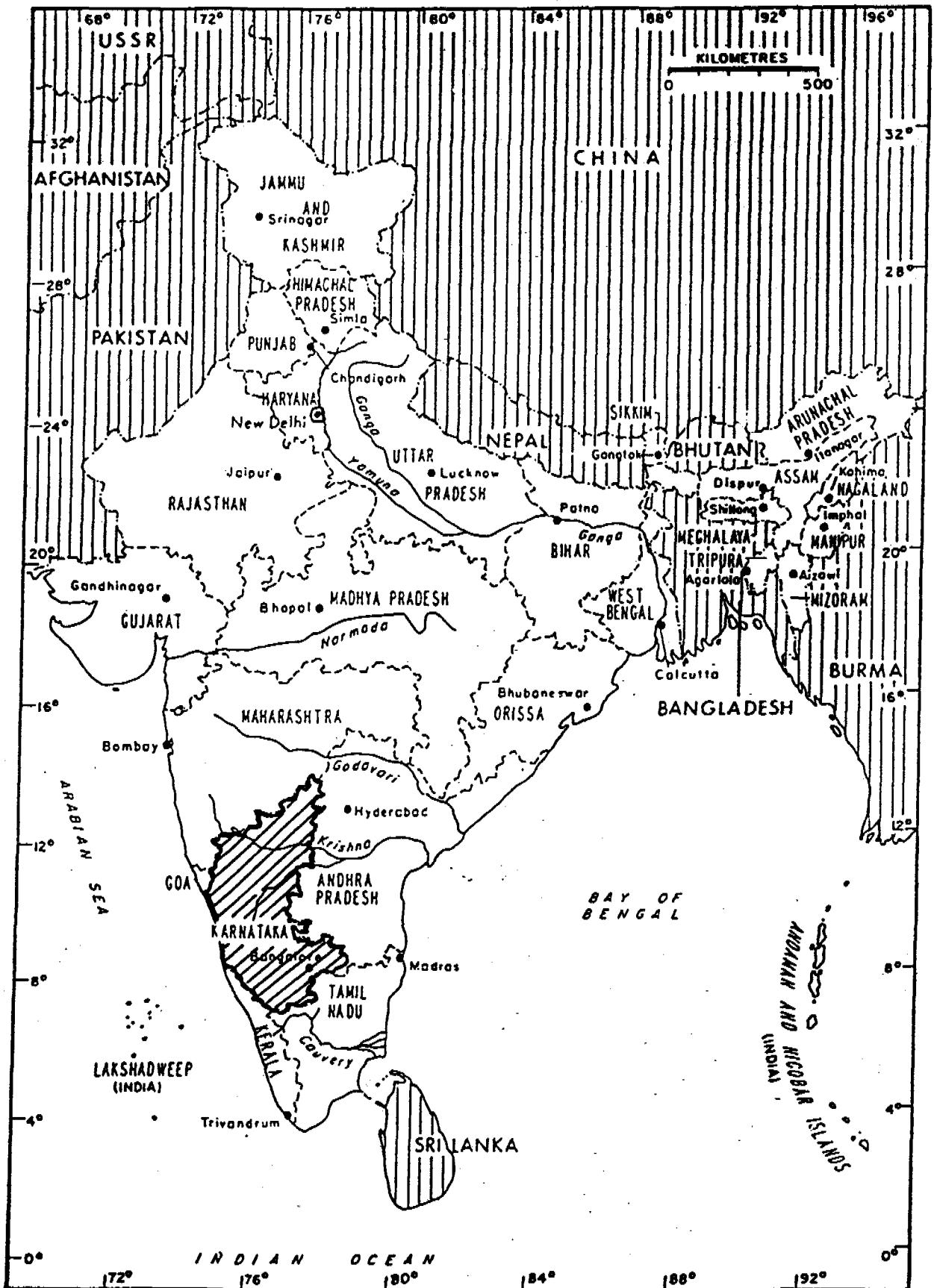
8,49,990

1,464

73,200 **

** Subsidy @ Rs. 50/- per capita

STATE OF KARNATAKA



EXECUTIVE SUMMARY
OF
THE DECADE PLAN OF WATER SUPPLY AND
SANITATION SECTOR (APRIL 1981 - MARCH 1991)
FOR
KARNATAKA

1. INTRODUCTION

The Karnataka State, situated in the Western part of the Deccan Peninsula, may be classified into 3 regions viz. the coastal, the Malnad (hilly) and the Maidan (plains). Coastal region lies between the Western ghats and the Arabian Sea and runs to a length of about 260 kms. and a width varying between 13.32 kms. in the North and 50 to 65 kms. in the South. The Malnad region stretches about 650 kms. in length and 50 to 60 kms. in breadth and is mainly hilly rising to an elevation of 1500 mts. and covered with forest.

To total area of the State is 19.18 million hectares, being 5.8% of the area of India, and 18% of it is covered by forest.

2. SOCIO-ECONOMIC INDICATORS

Karnataka has a population of 29.30 millions according to 1971 census, 7.10 million being urban and 22.2 millions rural. The urban population at the end of 1980 and projected for 1990 will be 9.54 and 12.16 millions respectively. Rural population at the end of 1980 and projected for 1990 will be 26.05 and 29.10 millions respectively. As against the All-India average of 19.9%, the urban population of Karnataka is 24.3%. The population density was 153 persons per sq. km. (1971 census).

Karnataka is basically an agricultural State and this sector contributes about 60% to the State's income. 44% of the urban population and 49.9% of the rural population are below the poverty line (overall 48.3%). The State's per capita income at current prices is Rs.1,246.

The literacy for urban and rural population at the last census (1971) was 51.4% and 25.1% respectively. The literacy percentage for males and females were 41.62% and 20.97% respectively.