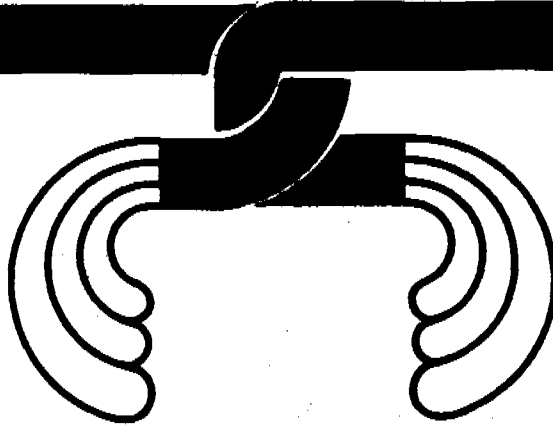


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**INDO-DUTCH
CO-OPERATION
IN**



**DRINKING WATER
SUPPLY
AND SANITATION
PROGRAMMES
IN
INDIA**

ROYAL NETHERLANDS EMBASSY
NEW DELHI
1990

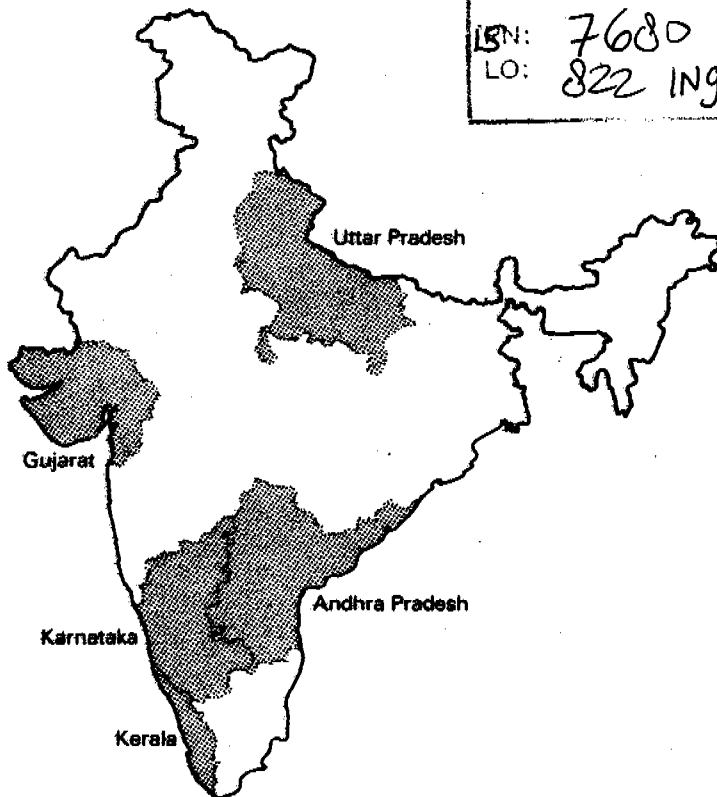
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INDO-DUTCH CO-OPERATION IN DRINKING WATER SUPPLY AND SANITATION PROGRAMMES IN INDIA

- Andhra Pradesh
- Gujarat
- Karnataka
- Kerala
- Uttar Pradesh

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INTRODUCTION

At the commencement of the International Drinking Water Supply and Sanitation Decade (1981-1990), it was estimated that 395 million people or about 58.7% of India's total population were without safe water supplies - 362 million in the rural areas and 33 million in the urban. In sanitation, the problem was even more grim in that 629 million people or 94% of the country's population were without an adequate and sanitary means of excreta disposal-521 million (or practically the entire population) in the rural areas, and 108 million or 73% of the urban population.

At the beginning of the Decade, the country set itself the target of providing the entire urban and rural population with safe water supply. It proposed to provide hygienic methods of disposal of human waste to 80% of the urban population and 25% of the rural population by 1991.

A mid-Decade review of the IDWSSD programme in India, made in October 1985 revealed that by the end of 1985 only 277.55 million people (or about 40.5% of the total population) would have been provided with water supply, and an estimated 42.83 million (Approx.6.3% of the total population) would have been provided with adequate sanitation facilities.

Globally, the World Health Organization had estimated at the commencement of the IDWSSD that approximately 3000 million people all over the world would have to be provided with safe drinking water supplies and hygienic methods of waste disposal.

A mid-Decade review of the global status of the programme indicated that, at best, only 20 to 25% of the target will be met by the end of 1990.

An analysis of the situation revealed that the original targets were over-ambitious and would

have to be scaled down to more realistic levels.

It was also discovered that many of the original assumptions had proved to be over-optimistic. Some of these assumptions were:

- that the provision of drinking water facilities would inspire interest in the local populations in the better use and maintenance of the systems;
- that local authorities were adequately equipped to maintain the systems in proper order;
- that local authorities had the necessary financial resources to ensure the on-going maintenance of the systems;
- that the provision of safe drinking water would automatically lead to an improvement in the health of the people.

Access to safe drinking water and adequate sanitation facilities are basic human needs indispensable to health and the ability to work. Water borne diseases are the leading cause of mortality and morbidity in developing countries. According to the WHO more than 80% of all diseases in developing countries are water related.

The Netherlands Government has recognized the importance of providing safe drinking water and adequate sanitation facilities to the people in developing countries. It has actively promoted projects, and has participated with several Governments to ensure the supply of potable water and hygienic systems of waste disposal for people of the poorer sections of developing countries.

The Netherlands Government is firmly committed to continue its programme of support to this sector. Currently, approximately 10% of

the Development Cooperation Budget (or about Dfl. 150 million annually) is being allocated to the provision of drinking water and sanitation facilities.

INDO-DUTCH BILATERAL COOPERATION

Indo-Dutch cooperation in the rural drinking water supply and sanitation sector dates back to 1978. This cooperation has developed rapidly to cover projects in the States of Andhra Pradesh, Gujarat, Kerala and Uttar Pradesh. In March 1989 agreement was reached to extend this cooperation to the State of Karnataka.

The average annual contribution of the Netherlands to this Sector is approximately 20 million Guilders (about Rs.18 crore), and constitutes approximately 10% of the total annual bilateral cooperation allocation for India.

The emphasis in the Indo-Dutch project is on an integrated approach to rural drinking water supply and sanitation. In effect this means that in addition to identification of sources, testing capacity and water quality, construction of headworks and distribution networks, construction of water treatment plants, construction of latrines and other technical works, there is also an intensive and systematic effort to involve the local communities, specially the women, in every aspect of project planning, designing, implementation and maintenance. Intensive health and hygiene education programmes both at community and school levels are intended to bring about improvements in personal and social practices which will contribute to the improvement of the health status of the people. Programmes of income generation for women constitute an important component of the projects.

A significant characteristic of the projects is that all the materials required are purchased in India out of Dutch funds.

The implementing agencies are the appropri-

ate departments of the respective State Governments, which, in turn send regular progress reports to the Government of India. These reports, including the statements of expenses, are transmitted to the Royal Netherlands Embassy for reimbursement to the Government of India.

A significant feature of the bilateral cooperation is the system of "pre-financing" which facilitates the start up of projects without imposing a strain on the financial resources of the implementing agencies.

A Water Programme Coordinator is stationed in the Embassy in New Delhi by the Government of the Netherlands to interact with the Government of India, the State Governments and the implementing agencies in respect of the projects in this Sector. He is responsible for facilitating the achievement of the overall objectives of the programme as agreed to bilaterally, and for identifying new projects. He coordinates the support services to the implementing agencies such as the biannual Review and Support Missions, training of engineers, evaluations, and workshops on common problems such as desalination, defluoridation slow sand filtration etc.

The Netherlands Government fields half-yearly Review and Support Missions to Andhra Pradesh, Gujarat and Uttar Pradesh. These Missions review the on-going progress of the projects and identify areas in special need of additional support. They offer technical advice as well as assistance in project monitoring, management and training.

In Kerala, a Netherlands Technical Liaison Officer has been appointed to assist the Kerala Water Authority with project design, technical supervision of implementation, quality control of materials and adherence to agreed norms to ensure cost effectiveness of the projects. To assist with the non-technical, socio-economic aspects of project implementation, the Netherlands Government supports two Socio-Eco-

conomic Units and a Coordinating Office in Kerala. The Danish International Development Agency, DANIDA, participates in the support to the Socio-Economic Units and the Coordinating Office. These SEUs promote community participation in project planning and implementation, health and hygiene education, training of local people for operation and maintenance and cost recovery.

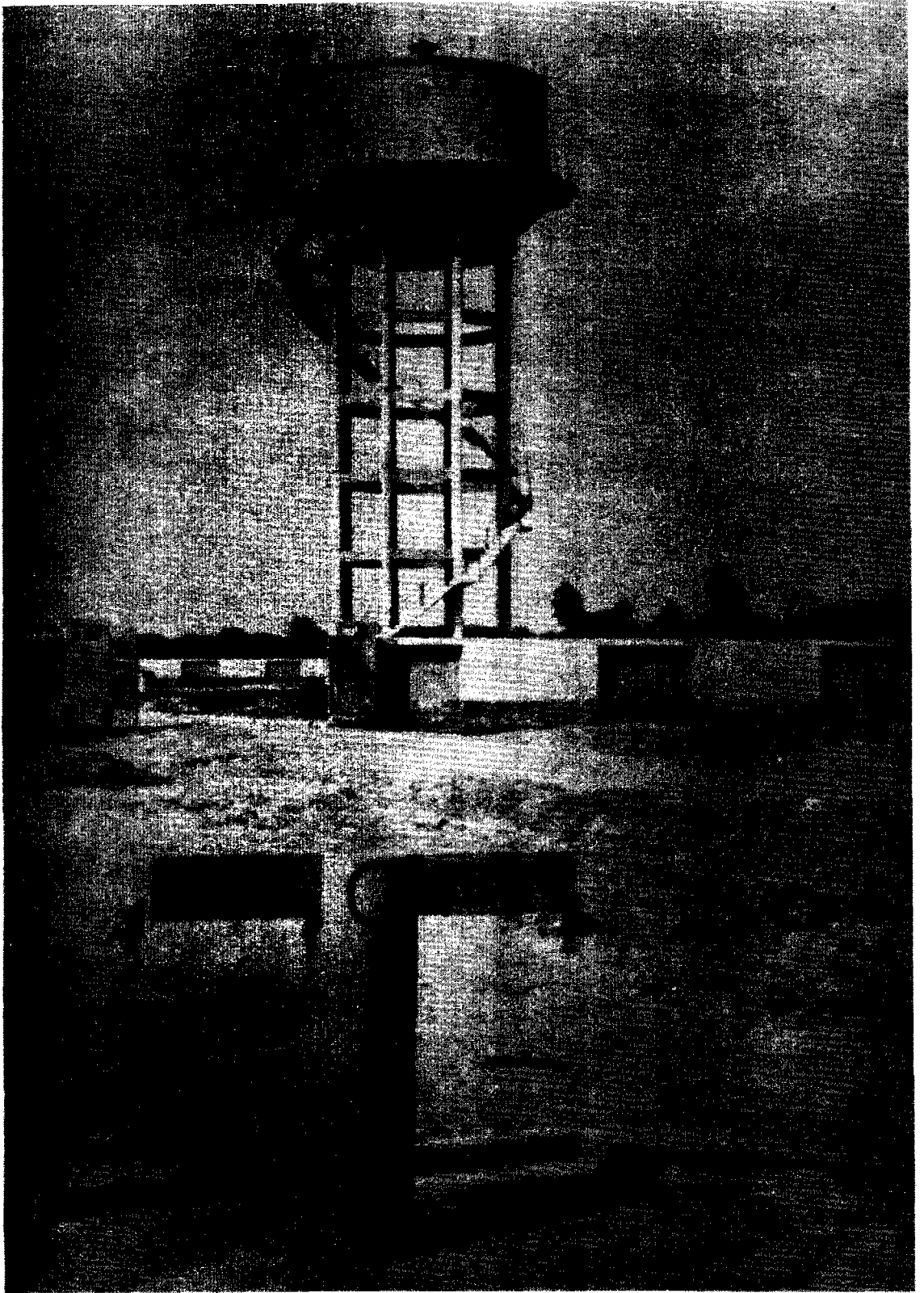
The technical and management support services provided by the Netherlands Government have been widely appreciated by the implementing agencies and the State Governments. A recent evaluation of the performance of these

support services revealed that the quality of the technical, management and organizational support can be enhanced by making them available as close as possible to the implementation level on a day-to-day basis. Accordingly, the Netherlands Government has decided to set up State level Project Support Units (to be called NAPSUs) to provide the implementing agencies with assistance in project management, monitoring, performance evaluation, organizational development and training. These services will be provided using indigenous expertise.

This brochure provides a broad over-view of the projects being implemented in the States of Andhra Pradesh, Gujarat, Kerala, Uttar Pradesh and of the project to be implemented in Karnataka.

This brochure is meant only to provide a general over-view of the Indo-Dutch cooperation in the rural drinking water supply and sanitation sector. While every effort has been made to verify the information, no claim is made to accuracy in every respect.

The financial figures provided refer to original cost estimates and do not necessarily reflect revised estimates or variations in the exchange rates at the time of actual disbursement.



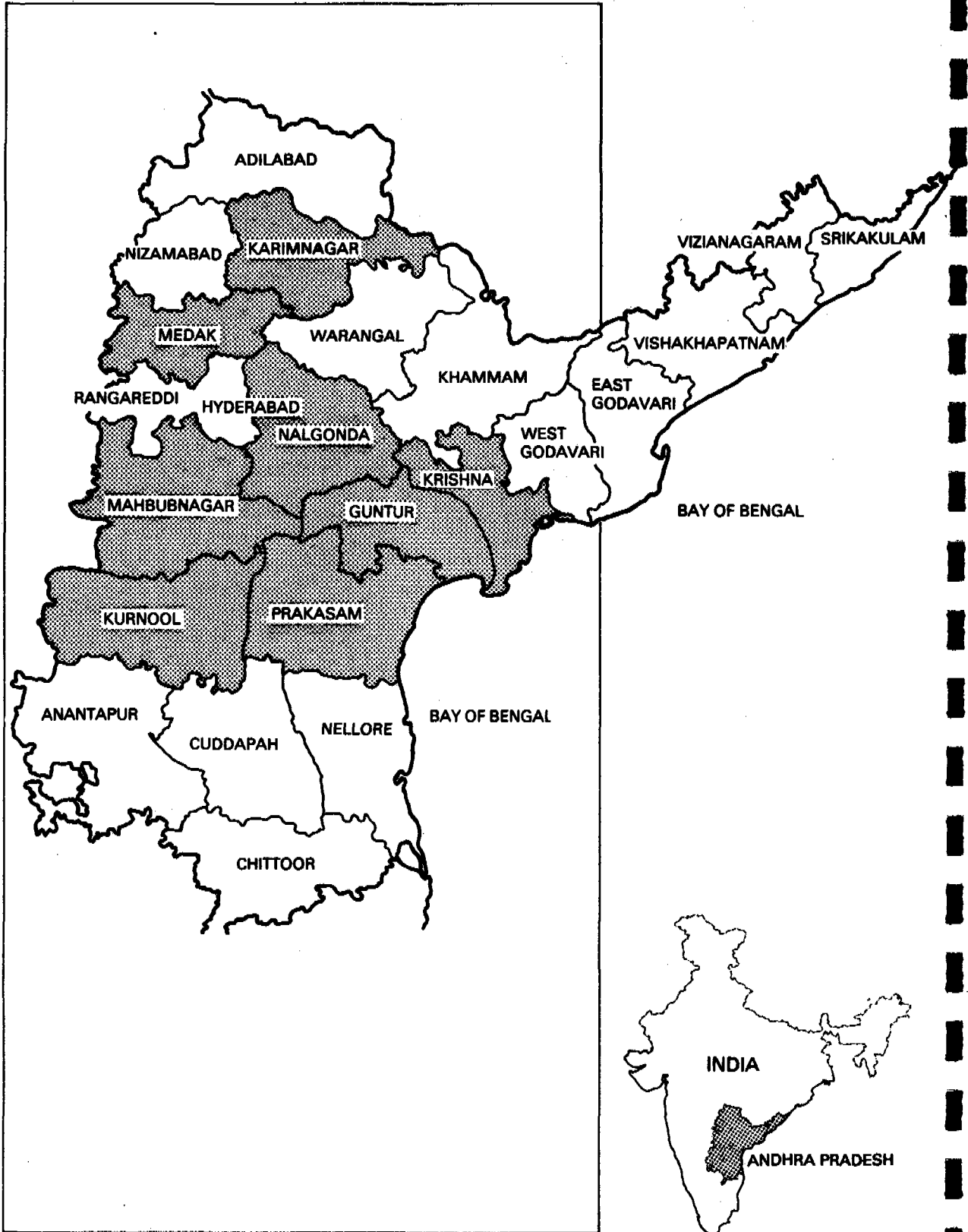
THE POLICY

The basic thrust of Netherlands development policy is to consider the drinking water supply and sanitation sector as one of the means of improving the living conditions and the health of the people: specifically, to fulfill one of the basic needs of the disadvantaged sections of the population, particularly, though not exclusively, in the rural areas.

Consistent with this basic thrust, some of the guidelines which have been formulated for the selection of projects are:

- * Focus on population groups most in need of assistance. Priority will be given to the poor in rural (and semi-urban) areas where the drinking water supply and sanitation conditions do not meet even the local minimum health standards.
- * Improving the health of the people will be the primary objective of the projects. Therefore, sanitation, health education and other health related components will receive due emphasis.
- * Community participation from the earliest stages of designing of the projects, as well as during implementation and operation will be insisted upon. Emphasis will be on the participation of women, who are the primary users of the facilities; and who are the major influence in determining the attitudes and practices in the community.
- * Long term viability of the projects has to be ensured. This will be done by:
 - enhancing local project management capacity;
 - adopting locally available, appropriate technology;
 - training local people in the proper use of the facilities;
 - training local people to maintain the equipment;
 - organizational development of the implementing agencies;
 - promoting community organization;
 - education and motivation for community participation.
- * In order to reach as many people as possible, the lowest investment and maintenance cost per capita will be criteria for selecting the technology to be applied, and for the selection of locations.
- * To ensure sustainability of the projects, users have to accept responsibility for the recurring expenses on operation and maintenance.
- * To conserve scarce water resources, and to keep costs to a minimum, consumers may have to accept relatively low, but economically feasible supply standards and simple technologies.
- * Inter-sectoral coordination is essential to maximize the benefits of the projects. The supply of potable water or the provision of latrines will not be considered as ends in themselves; nor will they be provided in isolation from other factors impinging on the development of the local communities.

ANDHRA PRADESH



ANDHRA PRADESH

Implementing Agency: Panchayati Raj Engineering Department

The Netherlands Assisted Programme in Andhra Pradesh focuses on rural drinking water supply to villages where the existing sources are contaminated with fluorides beyond acceptable limits.

In the early 1970s, the Government of A.P. prepared an inventory of 171 villages in which the water was fluoride affected. Subsequently, it was found that there were other villages which were also affected with fluoride concentrations much above the acceptable 1.5ppm limit. These villages were mainly in the districts of:

Prakasam	125 villages
Guntur	21 villages
Krishna	6 villages
Kurnool	2 villages
Nalgonda	14 villages
Karimnagar	3 villages

The design population of these 171 villages was estimated to be 718,000.

The Government of Andhra Pradesh had formulated a project proposal to supply potable drinking water to these villages. The estimated cost of the project was Rs.144.10 million.

The Netherlands Government provided financial assistance amounting to Rs.151.52 million to cover the 171 villages and an additional 30 villages to be covered by the comprehensive scheme for 81 villages with headworks at Darsi.

FIRST PHASE (AP I: 1978-1985)

The first phase of the project, implemented between 1978 and 1985, comprised 4 compre-

hensive schemes and 50 individual schemes, covering 201 villages in 6 districts.

Comprehensive Schemes

Prakasam District

1. Darsi and 110 villages
2. Chandravaram and 24 villages
3. Kurichedu and 5 villages

Krishna District

4. Adiviravulapadu and 5 villages.

Individual Schemes

Prakasam District

Individual Schemes to 12 villages

Guntur District

Individual Schemes to 21 villages

Nalgonda District

Individual schemes to 14 villages

Karimnagar District

Individual schemes to 3 villages

Kurnool District

Individual schemes to 2 villages

SECOND PHASE (AP II: 1987-1991)

In a new project, which is expected to be implemented during the period 1987 to 1991, a further 234 villages are planned to be covered with potable drinking water supplies and sanitation facilities. The total project (AP I and AP II) will now cover 435 villages in 8 districts in

Andhra Pradesh:

District	Phase I Villages	Phase II Villages	Total Villages
Guntur	21	-	21
Karimnagar	3	-	3
Krishna	6	-	6
Kurnool	2	64	66
Mahboobnagar	-	36	36
Medak	-	64	64
Nalgonda	14	-	14
Prakasam	155	70	225
8 Dist.	201	234	435

The total cost of phase I which was originally estimated at Rs.144.10 million rose to Rs.182.55 million.

The cost of Phase II, covering 234 villages is estimated at Rs.336.42 million.

The total estimated investment in the drinking water and sanitation sector in Andhra Pradesh is Rs.538 million.

Project Strategy

The project is divided into several component parts: water supply, sanitation, health education, income generation activities, water quality control and coordination and support services.

While the main implementing agency is the Panchayati Raj Engineering Department

(PRED) of the State Government, some of the components of the programme are being implemented by semi-government bodies such as the Andhra Pradesh Dairy Development Co-operative Federation, and some non-governmental agencies.

The distribution of financial inputs among the components is:

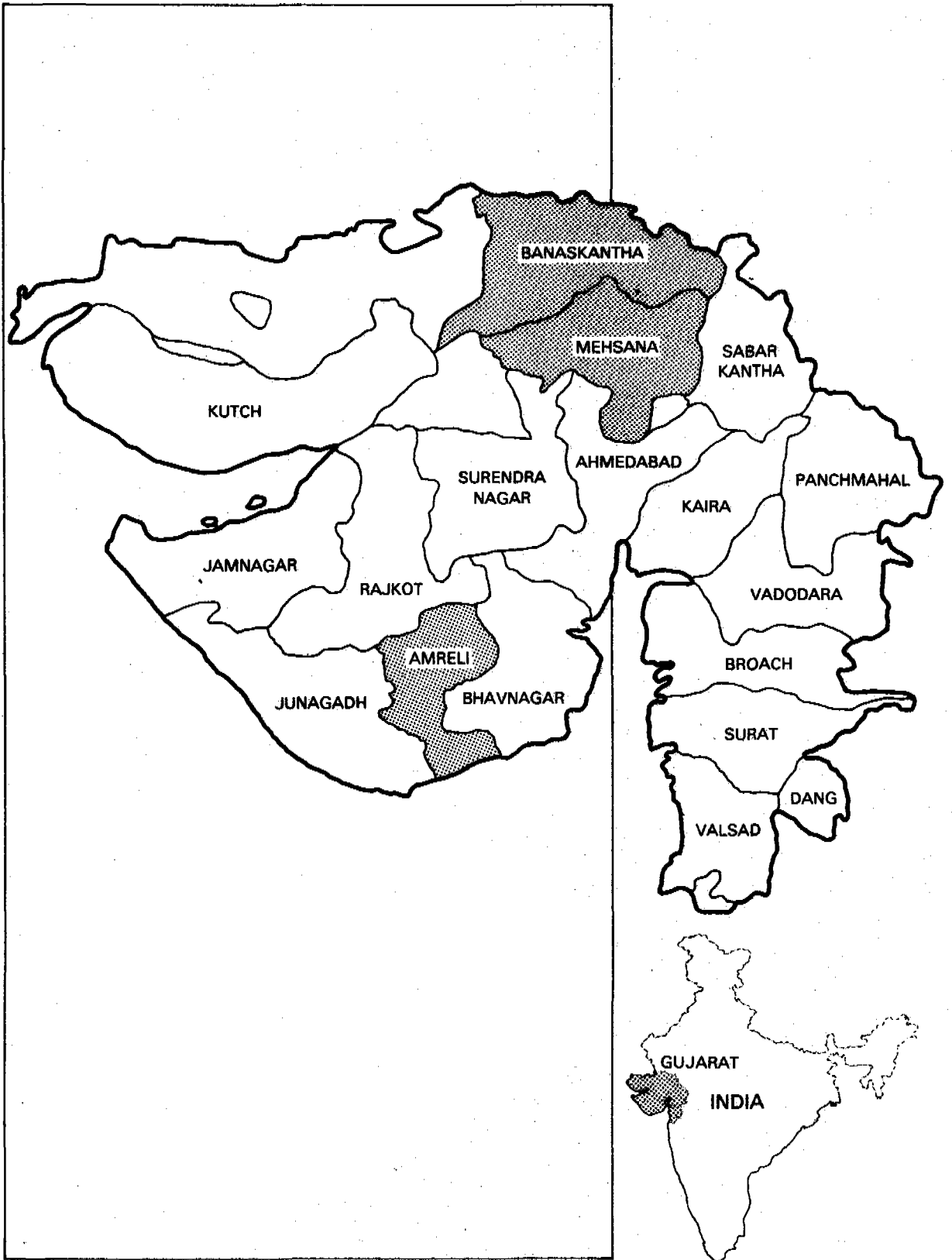
Water supply	Rs. 471.49	million
Sanitation	Rs. 26.67	million
Health education	Rs. 6.30	million
Income generation	Rs. 18.53	million
Water quality monitoring	Rs. 6.43	million
Baseline Survey	Rs. .67	million
N.A.P. office	Rs. 3.49	million
	<hr/>	
	Rs. 533.58	million

In order to monitor the overall performance of the project and to ensure effective coordination among the participating agencies a State level apex steering committee has been set up under the chairmanship of the Chief Secretary to the Government of A.P.

A Small Projects Support Office, called the NAP (Netherlands Assisted Projects) Office has been set up in Hyderabad to provide day-to-day support and advice in the implementation of the projects. The NAP office facilitates inter-departmental communications as well as serves to coordinate the activities of the non-governmental agencies which are participants in the projects. It also facilitates liaison with the Royal Netherlands Embassy in New Delhi.



GUJARAT



GUJARAT

Implementing Agency: Gujarat Water Supply and Sewerage Board

The Netherlands Bilateral Assistance to Gujarat started in 1978 with a proposal for the "Santalpur Regional Water Supply Scheme" in the Banaskantha District of North Gujarat. The scheme to supply water to 72 villages covered by the Santalpur project was expected to be completed by March/April 1986, at an estimated cost of Rs.87.335 million for the first stage of the project. The second phase was planned to be undertaken in 1993 at a further estimated cost of Rs.2.815 million.

In February 1985, eight new proposals for rural water supply projects were submitted for the consideration of the Government of the Netherlands. The total estimated cost of all the projects was Rs. 590,026,150.

After making an appraisal of all the proposals, the Government of the Netherlands agreed to support the following projects:

	<i>(Rs.in million)</i>
Santalpur Regional Water Supply Scheme	Rs. 99.500
Santalpur Extension (II)	Rs. 94.800
Sami-Harij Water Supply Scheme	Rs. 225.100
Lathi-Liliya Water Supply Scheme	Rs. 66.000

Santalpur I Scheme

The Santalpur scheme taps water from a confined aquifer by means of six tubewells between Shihori and Umbri. The project benefits the inhabitants of 72 villages in Santalpur, Radhanpur and Kankrej Talukas of Banaskantha District. The extension of this scheme

involves the construction of a radial well on the right bank of the Banas river. The water is pumped out from the tubewells by 15hp. submersible pumps and transmitted to Shihori, where a ground level storage capacity of 1.5 million litres of water has been created. There are two separate component sumps of 750,000 litres each. From Shihori the water flows by gravity over a distance of 42.96 kms. to Radhanpur, and from there it is pumped to R.C.C. elevated service reservoirs at Varahi which have a storage capacity of 650,000 litres.

Of the originally envisaged 72 villages which were to benefit from this scheme, one village was deserted (probably due to the severe drought); two villages (Roza and Datrona) were found to be technically unfeasible, but will be serviced by the extension scheme. One village (Amarajura) was disconnected because of frequent local tampering with the facilities. To the remaining 68 villages, eight villages were added under a State programme.

Santalpur Extension II Scheme

The Santalpur Extension scheme envisaged the covering of 48 additional villages and the township of Radhanpur. Presently, twenty villages have already been connected to the mains, making a total of 96 villages provided with water under this project. Another 28 villages, which now rely on brackish ground water or which are served by water tankers, will be connected as soon as the Umbri radial well has been connected, and the third main laid.

Sami-Harij Water Supply Scheme

The advantage of the Sami-Harij scheme is that it is located adjacent to the Santalpur

Scheme. The township of Sami has a population of between 10,000 and 12,000. An old well drilled in 1975-76 which had yielded good water earlier, turned saline after five years. The main illnesses in this place are water related. The township of Harij, which has a population of 15,000 is located adjacent to the Sami-Harij-Mehsana State highway.

The sources for the Sami-Harij water supply scheme are several wells which have been drilled by the Central Ground Water Board near Patan, close to village Kamlivada on the left bank of the river Saraswati. The production wells at Kamlivada have been drilled in phreatic aquifers and in (semi) confined aquifers. (waterbearing strata) Recharge of the phreatic aquifers will be through infiltration of precipitation, flooding of the Saraswati, and regional inflow of water.

The hydraulic gradient in the deeper aquifers is inclined in a south-west direction. The recharge area of the aquifers is situated in the Aravali foothills, and takes place through infiltration from the upper aquifers and through horizontal inflow.

The tubewells drilled by the Central Ground Water Board have been officially handed over to the Gujarat Water Supply and Sewerage Board. The water from these five, and seven other tubewells will be collected in elevated collecting chambers near Kamlivada and conveyed by gravity to the ground level reservoir near village Hajipur. From there the water will be conveyed to a reservoir of 300,000 litres capacity near village Boratwada in Harij taluka. The water will then be pumped into elevated service reservoirs and distributed through a network of cisterns to public standposts. Cattle will be served through cattle troughs.

The Sami-Harij Regional Water Supply Scheme will benefit one hundred and eleven villages

and the township of Harij. The total estimated beneficiary population will be 332,827.

Lathi-Liliya Regional Water Supply Scheme

The Lathi-Liliya regional Water Supply Scheme is designed to provide water to 36 villages and the township of Damnagar in the Taluka of Lathi Liliya of Amreli District. This area is chronically affected by fluorosis. The fluoride content in ground water is abnormally high. The villages which will be served by the project are 13 in Lathi Taluk and 23 in Liliya Taluk with an estimated population of 30,892 and 47,583 respectively. The township of Damnagar has an estimated population of 23,770. To provide potable water to this population of 102,245 in 2010 it is estimated that the requirement will be 6.70 million litres per day.

The project will lift water from the Kalubhar Dam which has been constructed on the river Kalubhar about 26 Kms. from Damnagar, near the village Limbala of Bhavnagar district. The catchment area will be filled by rain water during the monsoon, and has a storage capacity of 23.48 million cubic metres. An amount of 2.70 m.c.m. of water is earmarked for the Lathi-Liliya Regional Water Supply Scheme. The water will be pumped from the reservoir over a distance of 26 kms. to Damnagar, where it will be treated in a water treatment plant. It is proposed to set up a slow sand filtration plant with a capacity of 333.33 cu.m./h. From the filtration plant, water will be lifted to an elevated service reservoir of 100,000 litre capacity. From this E.S.R. six villages of the Rabhada group will be served through a distribution system.

A pumping main of 350 mm. dia. will pump clear water over a distance of 8,400 metres to an E.S.R. near Bhingrad village, from where it will be distributed to the remaining villages.

For the township of Damnagar, there will be a separate pumping system with E.S.R.

Twenty-two of the villages in the target area already have cisterns, which will be integrated into this scheme. In the fourteen remaining villages, cisterns will be constructed.

Pilot Sanitation Project

The Netherlands assisted projects in Gujarat are intended to have a health impact on the population of the target areas. Along with supplies of water, it is intended to promote a sanitation component with latrine construction as an important aspect.

As a first-step, a proposal to construct low-cost sanitary latrines was prepared by the Gujarat Water Supply and Sewerage Board with assistance from the Environmental Sanitation Institute, Ahmedabad. After discussions, the proposal was modified to conform to the following criteria:

- the project should be implemented in two villages with a population of between 500 to 700.
- there should be full coverage of all the houses.
- substructures upto plinth level should be constructed free of cost.
- contribution by beneficiaries through labour.
- the GWSSB will provide four or five types of superstructures as models.
- subsidy on superstructures according to Government policy.

- monitoring by GWSSB during construction.

- reinforcement of community support through assistance of NGOs involved in the water supply programme.

Socio-Economic Unit

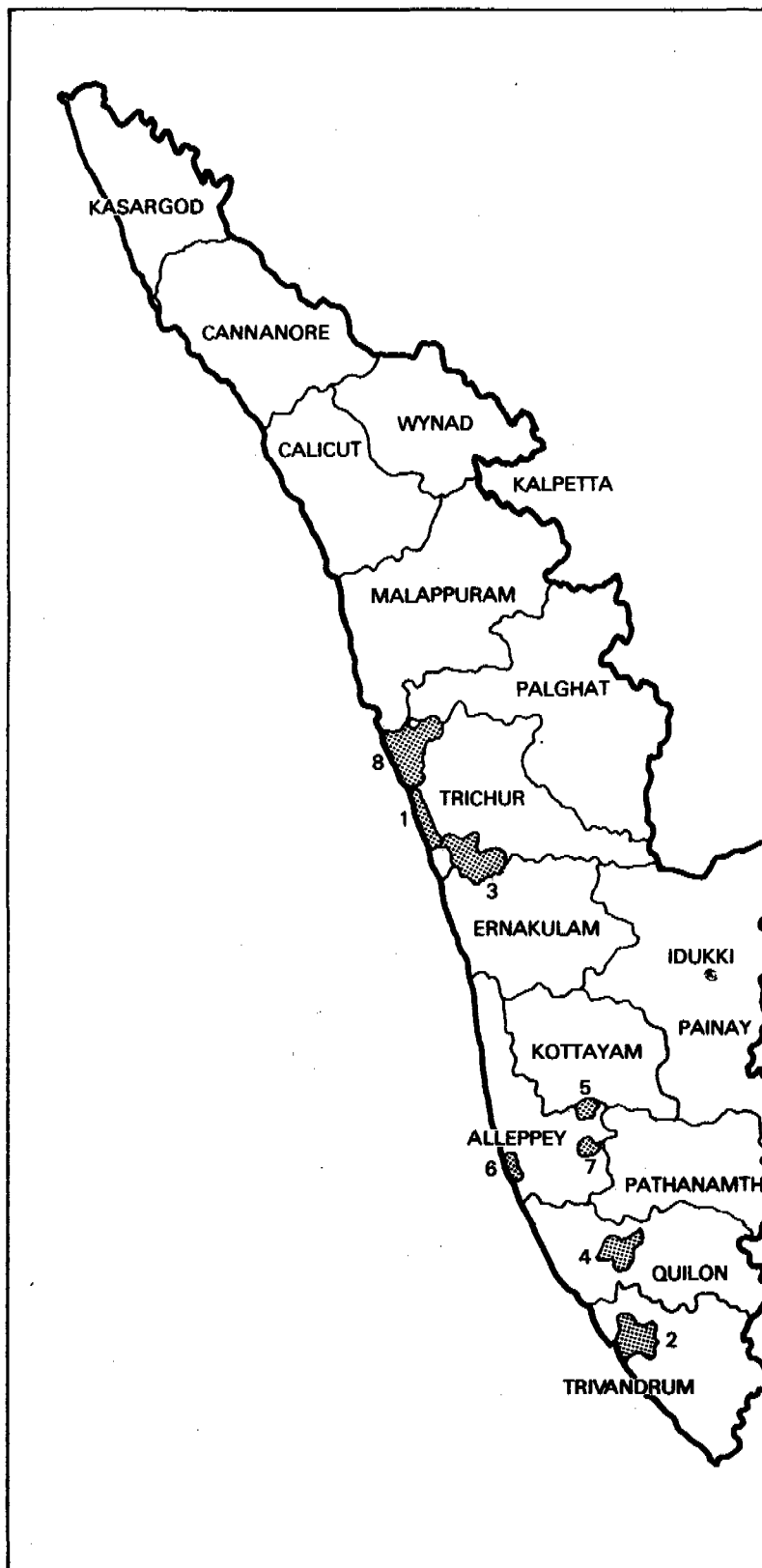
The GWSSB resolved to set up a socio-economic unit in the Executive Office in order to ensure an integrated approach of the projects. The Socio-economic Unit will consist of a Sociologist, a Medical Health Officer and a Public Health Engineer.

The Socio-Economic Unit will participate in the training programmes envisaged under these projects to promote a multidisciplinary training to the candidates of the courses.

With financial assistance from the World Bank a training institute has been constructed in Gandhinagar, called the Gujarat Jal Seva Training Institute. The Governing Council of the Institute is headed by the Chairman of the GWSSB. The Director, two Joint Directors and supporting staff have been identified. The Institute will be equipped with a library, laboratory and mechanical workshop. The training programme envisages the training of the technical staff of the GWSSB, managerial level and supervisory staff, grassroots level workers, and persons handling accounts, administration and stores.

Besides the staff of the GWSSB, the Institute will train nominees from local bodies including Municipal Corporations and members of Panchayats and persons who are closely involved in mass awareness programmes such as paramedical officers, social workers, school teachers and community leaders.

KERALA



1. Nattika Firka
2. Vakkom Anjengo
3. Mala
4. Kundara
5. Koipuram
6. Thrikunnapuzha
7. Cheriyanadu
8. Pavaratty



KERALA

Implementing Agency: Kerala Water Authority

The Netherlands Government is currently supporting eight on-going water supply schemes in Kerala.

1. *Comprehensive water supply to Vakkom Anjengo*

This project covers six panchayats in the Chirayinkhil Taluk in Trivandrum district. The panchayats are:- Vakkom, Kadakkavoor, Anjengo, Chirayinkhil, Kizhuvallam and Azhoor. The project area extends over 62.044 sq.kms. The population expected to benefit from this project will be 194,200. The project was started in 1977 and was expected to be completed during 1991-92. The original estimate of Rs.38.2 million had to be revised to Rs. 42.25 million.

2. *Comprehensive water scheme to Nattika Firka*

This project covers ten panchayats - Engandiyoor, Vadanappally, Thalikulam, Nattika, Valappad, Edathuruthy, Kaipamangalam, Perinjanam, Pappinavattom and Sreenarayanapuram. It covers an area of 137.32 sq.kms. in a north south direction in Trichur district. The beneficiary population is estimated at 401,800. The scheme was started in 1982 and was estimated to cost Rs.67.4 million, but had to be revised to Rs.117.6 million.

3. *Water Supply to Mala and adjoining Panchayats*

Started during 1985-86, this scheme is intended to serve a population of 203,750 in six pan-

chayats-Mala, Annamanada, Kuzhur, Poyya, Puthenchira and Vellangalur, extending over an area of 147 sq.kms. within the taluks of Mukundanapuram and Cranganore in Trichur district. The river Chalakudy flows through the east and south boundaries of the project area. A treatment plant at Vyanthala which is being constructed for an urban water supply scheme for the town of Kodungallor will serve as the source for this project also. The supply system envisages the laying of 193 kms. of pipes with 520 taps. Expected to be completed by the beginning of 1990, this project was estimated to cost Rs.33.812 million.

4. *Water supply scheme to Thrikkunnapuzha*

Situated in Karthiyapally taluk in Alleppey, Trikunnapuzha panchayat spreads over 12.53 sq.kms. and comprises of eleven wards. The river Trikkunnapuzha passes through this panchayat on its way to the backwaters of Kayamkulam. The panchayat is water-logged and the surface water is saline. The Central Groundwater Board has constructed a tubewell to a depth of 600 metres using 350 mm diameter pipes to a depth of 50 metres. The well yields 68,000 litres of water per hour. This project uses this well as its source and distributes the water through 15,870 metres of PVC pipes of sizes varying from 160mm to 40 mm. The distribution pipes cross the canals at 23 places. These crossings are made with High Density Polythene Pipes and provision has been made for 25 valve chambers.

The supply of water is effected through 95 street fountains. The project proposes to add another 14 outlets in the western area for which an additional 4,200 mts. of 50mm PVC pipes will be required, bringing the total length of pipes to 20,070 mts. Serving a total estimated population of 10,839 by the year 2011, the project was estimated to cost Rs.2.414 million.

5. *Water supply scheme to Koipuram*

Koipuram panchayat which is 13 kms. east of Thiruvalla municipal town spreads over 5 sq.kms of undulating territory consisting of hillocks and valleys. The river Pampa flows along its southern boundary. The population is 44,450.

Using the water of the Pampa river as the source, the project consists of an infiltration well 6 m in diameter at Konmathukada with three rows of infiltration galleries of 20 m. length. The water will be distributed through 32,960 mts. of pipes with 115 public street fountains as outlets.

Started during 1985-86, this scheme was expected to be completed by mid-1991 at an estimated cost of Rs.9.2 million.

6. *Water supply scheme to Cheriyanadu*

Situated about 60 kms. east of Alleppey municipal town, the Cheriyanadu panchayat covers 13.20 sq.kms. of Chengannur taluk in Alleppey district. The river Achancoil flows along its south-west boundary. This being one of the perennial rivers of the State, its water is used as the source to serve drinking water to an estimated population (projected to 2011) of 34,749. The river is tapped at Kolakadavu by means of an infiltration gallery and a well constructed

on the river's bank. Using PVC pipes, the distribution system is confined to one zone with a proposed 90 street taps. The project started during 1985-86 was expected to cost Rs.4.2 million.

7. *Water supply to Kundara and adjoining panchayats*

This scheme, started in 1985-86, is designed to provide water to an estimated population of 218,000 in the 7 panchayats of Kundara, Perayam, East Kallada, Ezhukone, Pavithreswaram, Neduvathoor and Kulakada. These panchayats situated in Kottarakara taluk cover an area of 162.64 sq.kms. The project will cover 80% of the project area.

The source of water will be the Kallada river which flows through the northern boundary of the project area. Since the river is polluted downstream by effluents from the Punalur Paper Mills, it will be tapped upstream from the Mills. Expected to be completed in 1992, the project is designed to supply water through 555 street taps and was estimated to cost Rs.71.2 million.

8. *Comprehensive water supply scheme to Pavaratty and adjoining panchayats.*

The project area of 220 sq.kms. which lies about 80 kms. west of Palghat municipal town and 40 kms. north of Trichur town covers four panchayats in Palghat District and fourteen panchayats in Trichur District. The project area is bounded by the river Bharathapuzha to the north and the Arabian sea and Malapuram District to the north-west. The total estimated population which will benefit from this project is 522,000.

Studies on groundwater potential of the Bharatpuzha river basin are being conducted by the Centre for Water Resource Development and Management (CWRDM) in Calicut.

The project was expected to cost Rs.174.600 million.

TECHNICAL LIAISON OFFICER

To assist the Kerala Water Authority with the design of projects, technical supervision of works, quality control of materials and to ensure cost-effectiveness of project implementation, the Netherlands Government has placed an engineer in Trivandrum to serve as a Technical Liaison Officer with the KWA. He maintains close contacts with the Chief Engineer in charge of designing and planning of projects, and offers advice on a day-to-day basis.

SOCIO-ECONOMIC UNITS

The provision of safe drinking water is only one aspect of the project which is intended to improve the health of the people in the project areas. There are other important socio-economic aspects which need to be attended to if the objectives of the project are to be realised, such as formation of ward water committees, health education programmes and creation of public awareness, construction of latrines and motivating the user communities to contribute towards the operation and maintenance of the systems.

Together with the Danish International Development Agency (DANIDA), three Socio-Economic Units have been set up at Quilon, Trichur and Calicut. The location of these

SEUs corresponds to the administrative divisions of the Kerala Water Authority viz., South Central and North. They function in close cooperation with the Superintending Engineers concerned. A Co-ordinating office in Trivandrum coordinates the work of the three units, as well as providing programme coordination with the Kerala Water Authority.

Each Socio-Economic Unit consists of a Social Scientist, a community organizer and a health educator. This core team is supported by administrative and field staff.

The Coordinating Office in Trivandrum is headed by an Executive Coordinator, who is advised by an expatriate Socio-Economic Adviser. He is assisted by a Finance-cum-Accounts Officer and supporting administrative staff.

The Socio-Economic Units (together with the coordinating office in Trivandrum) were set up as a separate project for an experimental period of three years by the Netherlands Government because the idea of incorporating socio-economic parameters in project design was new to the KWA. The SEUs were intended to demonstrate the importance of socio-economic factors in the long-term sustainability of the projects in terms of people's participation in the operation and maintenance of the installations and their contribution to the recurring costs of O&M.

The SEUs initiated several action oriented research studies covering such areas as peoples utilization of the facilities; their willingness to pay; the knowledge, attitudes and practices in relation to water and sanitation.

The SEUs also helped to prepare ward level and panchayat level maps, which have been acknowledged to have contributed greatly to the better design of projects. They have also organized users committees and prepared a manual for these water committees.

UTTAR PRADESH



UTTAR PRADESH

Implementing Agency: U.P. Jal Nigam

An agreement was entered into between the Government of India and the Government of the Netherlands in 1978 to provide safe water supply to problem villages in Uttar Pradesh.

Under the Dutch Credit Programme, the following projects have been taken up:

Sub-Project I - Piped Water Supply - East Districts of Allahabad, Raebareli and Varanasi.

This project consists of 22 piped water supply schemes to provide water to 724 problem villages identified by the U.P. Government, benefiting approximately 713,000 persons in the Districts of Allahabad, Raebareli and Varanasi in Eastern Uttar Pradesh.

The scheme was estimated to cost Rs.164.20 million.

The project was completed in June 1987. The final claims against this project amounted to Rs.165.30 million.

Sub-Project III - Handpumps Scheme - Agra, Mathura, Etawah and Allahabad

This scheme is intended to extend safe drinking water facilities to 603 villages in the districts of Allahabad, Agra, Mathura and Etawah by installing 3172 India Mark II handpumps in these villages. The project was estimated to cost Rs.65.3 million and work on the project commenced in 1985-86.

As a result of discussions with various Dutch Review Missions the project has been expanded to provide an additional 1211 handpumps. Additionally, the project will provide zonal and mobile water testing laboratories at Agra, Mathura and Etawah, as well as inspection

houses at Mathura and Etawah. Consequently the cost estimates have gone up to Rs.110.438 million.

In the meantime, 4006 handpumps have been installed in 583 villages by June 1988 (out of a targeted 4383 handpumps in 603 villages).

Because of severe drought conditions prevailing during 1986-88, the U.P. Government proposed the inclusion of the neighbouring districts of Mainpuri and Farrukhabad in this project.

Sub-Project IV - Piped water supply scheme - Allahabad and Varanasi

This sub-project proposed to set up nine piped water supply schemes to 179 villages of Varanasi district and two piped water supply schemes to 23 villages of Allahabad district. The total population to be benefited (estimated in 2019) will be 384,000. The projects were estimated to cost Rs.107.85 million.

Construction under this sub-project started in December 1987. Seventeen tube-wells (of the 18 envisaged) in Varanasi district have been constructed, and other works are in progress.

Due to a delay in the start of the project which resulted in cost escalation, as also in order to provide additional drainage for the disposal of waste water from public standposts, the cost of the project had to be revised upwards to Rs.112.56 million

Sub-Project V - Rural Sanitation, Health Education, Community Participation.

Sub-Project V is basically a pilot project to incorporate aspects of community participation, health education and rural sanitation into the projects being implemented under Sub-Project

I and III. Sub-Project V envisages the construction of 13,350 household latrines in the 27 villages in the Tikri Group in Varanasi district, and 19 villages in the Thulendi Group of villages in Raebareli district. The Scheme envisages the provision of free latrines to 7902 households of people living below the poverty line (with an annual income of less than Rs. 3,500). This includes 2718 households of Schedule Castes and Schedule Tribes. The remaining 3238 households will be provided with a subsidy of 80% of the cost of the latrines. The remaining 20% has to be borne by the beneficiaries either in cash or as free labour.

Besides the household latrines, the project envisages the construction of five 4-seater latrines in 4 schools in the Tikri group of villages, and thirty-nine 2-seater latrines in 39 schools in the Thulendi group of villages. The estimated cost of the 4 seater latrine is Rs.16,800 each, and of the 2-seater is Rs.10,500 each. These school latrines will be constructed by U.P.Jal-Nigam, which will also extend water supply to, and construct tank-type standposts in each of the 43 schools in the project area.

A baseline survey will be carried out in the project area by U.P. Development Systems Corporation (UPDESCO) in Rae Bareli and by Banaras Hindu University in Varanasi. Health education campaigns will be carried out by BHU in the Tikri group of villages, and by the DWCRA (Development of Women and Children in Rural Areas) in the Thulendi group of villages).

Sub-Project V also envisages the establishment of a Programme Support Unit (PSU) composed of a Social Planning Adviser, a Manager, who is a Public Health Engineer and an Office Secretary. The major objectives of the PSU are:

- to provide the necessary professional inputs in the areas of planning and implementation of software packages for ensuring health education, community participation and involvement in the rural

sanitation programme.

- to provide coordination with the various implementing agencies of Sub-Project V.
- to provide necessary support to the U.P. Jal Nigam in its on-going Rural Water Supply Programme under the Dutch Assisted Programme.
- to assist the Biannual Review and Support Missions fielded by the Netherlands.
- to ensure a continuity of relationships and interactions between the various agencies involved and the Royal Netherlands Embassy in New Delhi.

The total cost of this project is estimated to be Rs. 30 million.

Sub-Project VI - Handpumps Schemes

This sub-project envisages the installation of 10,800 India Mark-II handpumps in 1410 villages benefiting a population of 1.8 million in the districts of Lakhimpur-Kheri, Bahraich, Gonda, Basti and Ballia. The sub-project is estimated to cost Rs.224.3 million and is being implemented.

Sub-Project VII

Piped water supplies for ten rural towns and adjacent villages in the districts of Almora, Meerut, Bulandshahr, Bareilly, Mainpuri and Etawah. The project is in the process of appraisal and is estimated to cost Rs. 254 million.

COMMUNITY PARTICIPATION

A very prominent feature of the Indo-Dutch Bilateral Cooperation programme is the emphasis which is given to the participation of the local communities, particularly of women, in the planning, implementation and operation of the projects. They are consulted in the selection of sites for the public standposts or handpumps, the choice of technology to be used and selection of individuals to be trained for operation and maintenance of the systems.

This emphasis on community participation is intended to reinforce in the users a sense of ownership of the assets, and consequently, a sense of responsibility for the continued maintenance of the systems. It is based on the assumption that people will not assume responsibility for the maintenance of equipment which, in their perception, belongs to the government.

Community participation is emphasized not merely as a legal preference, but is determined by social economic and cultural factors which indicate that the long-term sustainability of projects is directly related to the extent to which people are committed to preserving and maintaining their own assets.

Community participation takes many forms in the various projects.

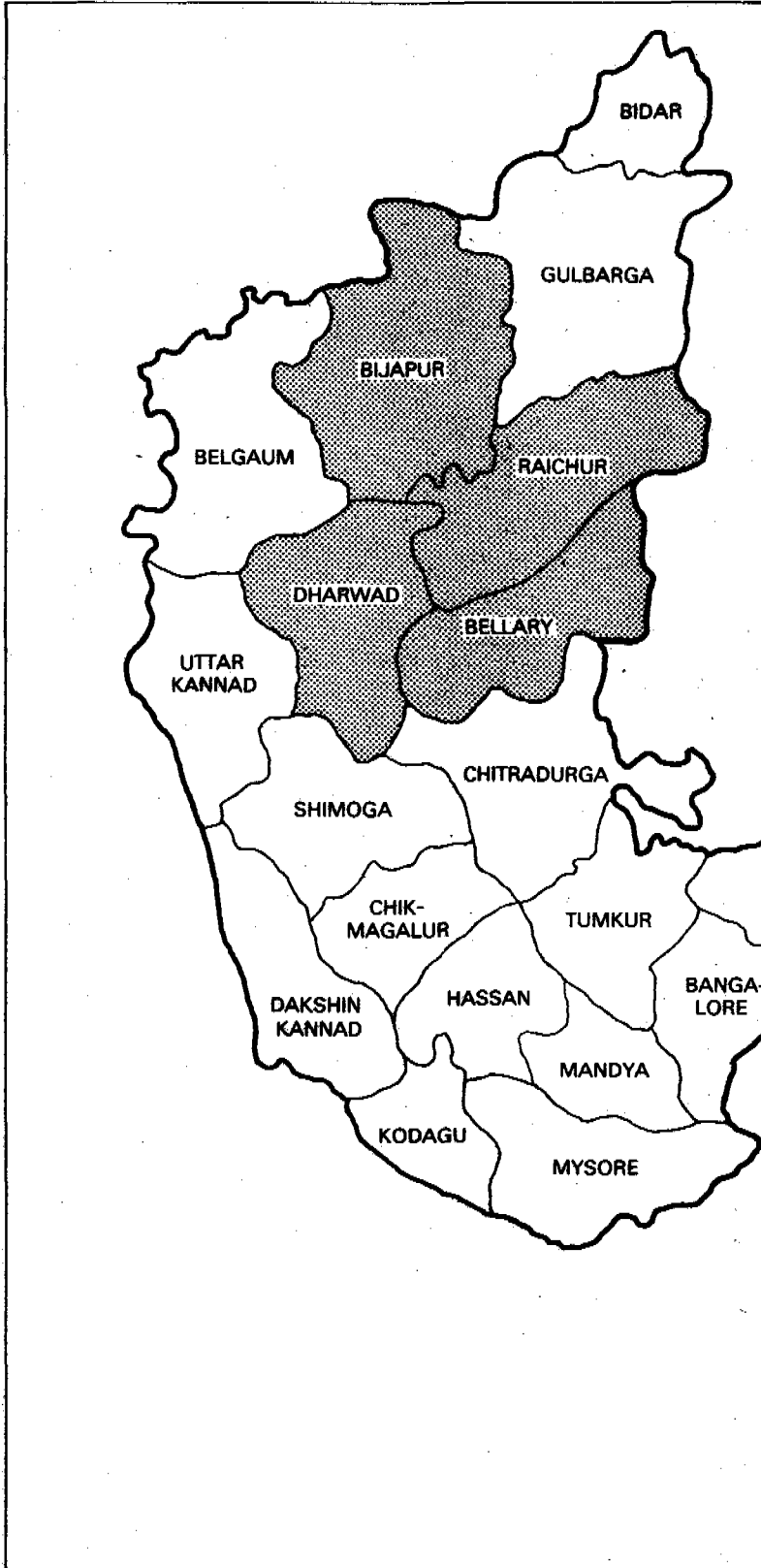
The sub-project VI in U.P. has a specific "community participation component" which will cover 1410 villages in five districts of eastern U.P. viz. Ballia, Gonda, Basti, Bahraich and Lakhimpur.

In the on-going project of construction of latrines, the under privileged people who live below the poverty line contribute about 20% of the cost of the sanitary latrine by way of labour. The other poor people also contribute cash in addition to their labour.

In Andhra Pradesh, the project contains a separate component to enhance the income levels of the women through formation of dairy cooperatives. The generation of additional incomes, it is hoped, will enable the people to contribute to the recurring expenses on operation and maintenance of the schemes.

In Kerala community participation is the main focus of the Socio-Economic Units.

KARNATAKA



KARNATAKA

Implementing Agency: Public Health Engineering Department

In March 1986, it was agreed that the Netherlands assistance to rural water supply projects in India will be extended to the State of Karnataka.

The Public Health Engineering Department (PHED) of the Government of Karnataka prepared an outline of a proposal which was submitted in October 1986 simultaneously to the Government of India and the Royal Netherlands Embassy.

In January 1987, the Netherlands Ministry for Development Cooperation fielded a Mission to prepare a conception report for an integrated rural water supply programme in Karnataka. The conception report contains background information, criteria to be applied, and broad outline of the scope of the programme. The Conception Report forms the basis of the Bilateral Agreement between the Government of India and the Government of The Netherlands.

The proposal envisages inclusion of 364 problem villages from four Districts:

District	No. of Villages	Population 1981	Population 2005
Dharwad	100	155,350	217,533
Bijapur	170	390,494	546,692
Raichur	20	29,610	41,454
Bellary	74	136,437	191,012
Total:	364	711,891	996,691

Of the 364 villages selected, 183 are from drought prone zones, and 24 villages have water sources which are brackish and fluoride contaminated. The project will be implemented by the PHED, while health education, training and community

awareness building will be the responsibility of the Bureau of Health Education and Training of the Department of Health and Family Welfare.

The project will be an integrated project with the following components:

- rural water supply
- rural sanitation
- simultaneous health education and training
- community involvement (specially of women)
- involvement of NGOs
- baseline surveys and regular monitoring and evaluation of the health impact of the project
- institutional strengthening of the PHED and the establishing of a social wing.
- monitoring, training, preparation of manuals and supply of additional equipment.

The Mission recommended that, in general, traditional low cost sources (wells provided with handpumps) be selected as the economically most attractive solution. However, wherever such technologies cannot be adopted, solutions as per guidelines of the Technology Mission be adopted. There are three different types of schemes in Karnataka:

1. handpumps schemes for villages with less than 1,000 inhabitants;
2. mini water supply schemes for villages

with 1,000 to 2,000 inhabitants;

3. piped water supply schemes for villages with 2,000 and more inhabitants.

For the sanitation projects, the Mission recommended unsophisticated pit latrines and pour flush latrines to initiate gradual acceptance by the users of this method of disposal of human waste, and to provide possibilities for dissemination of knowledge on its construction and proper use.

For desalination and defluoridation, the Mission observed that existing systems were not very efficiently maintained, and the O & M costs were high. The Mission recommended pilot studies and further investigations before any decision is made on widespread application of any particular system.

The Mission recommended the use of existing designs for iron removal as these are less sophisticated and are well known throughout India. However, effective maintenance and operation, and trained caretakers are indispensable for the successful operation of the systems.

The Mission observed that the institutional strengthening of the PHED will have to be given high priority. It recommended, inter alia, the setting up of a social wing attached to the Chief Engineer's Office to assist the PHED in social and logistical planning, coordination and integration of the different elements of the project, and monitoring and evaluation of the implementation of the project. The recommendation is for a female sociologist to serve as programme officer, a public health expert and an institutional expert.

The Mission made many recommendations regarding the organisational and supervisory

structures to be constituted for the implementation of the project. At the State level, it recommended a Steering Committee to review and monitor the performance of the different agencies involved in project implementation. This steering committee will be composed of the Development Commissioner as the Chairman; the Chief Engineer of PHED as Member Secretary; and other officials as members, including the Secretary, Rural Development and Panchayati Raj Dept.; Secretary, Public Works, CADA and Electricity; Chairman, Electricity Board; Secretary of the Financial Commission; Director of Social Welfare; Secretary, Labour Welfare; and Secretary, Public Health Department. The Water Coordinator at the Royal Netherlands Embassy will also be a member of this Steering Committee.

The provisional estimated cost of the project is approximately Rs. 250 million, with percentage distribution among the various components as under:

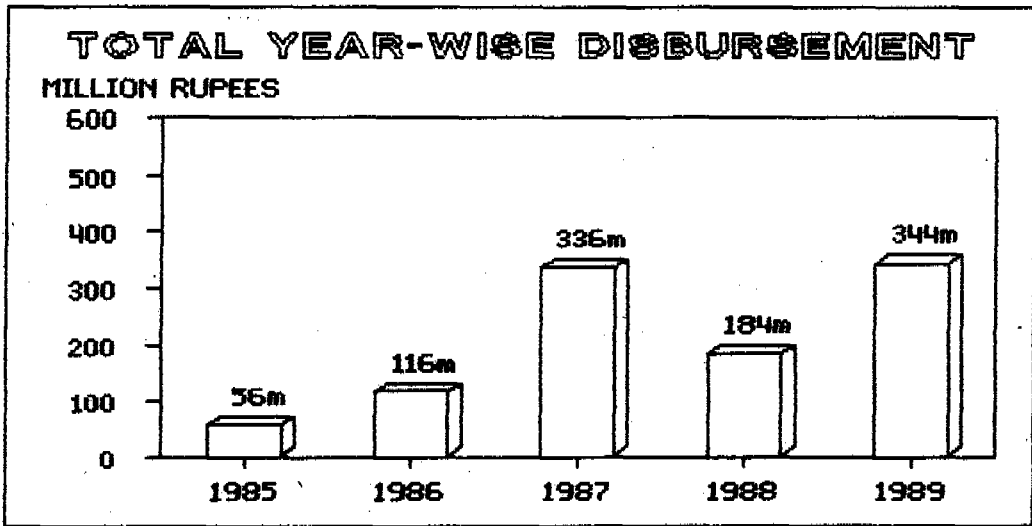
- Establishment of Water Quality Monitoring Wings	0.7%
- Supply of geophysical equipment, running, training	0.9%
- Technical assistance from local consultants	0.6%
- Baseline surveys	0.1%
- Health education programmes	0.3%
- Training	1.0%
- Rural Water Supply Schemes	83.7%
- Rural Sanitation Schemes	12.7%

FINANCIAL OVERVIEW

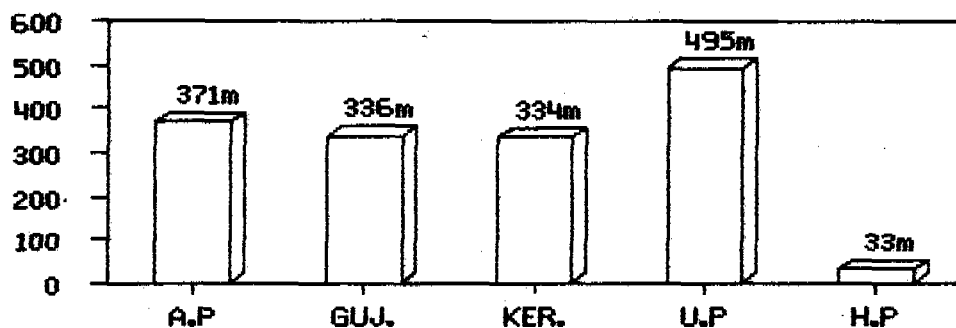
The Rural Drinking Water Supply and Sanitation projects which are being supported by the Netherlands Government under the Indo-Dutch Cooperation Programme, are situated in the States of Andhra Pradesh, Gujarat, Kerala and Uttar Pradesh. This support will soon be extended to the State of Karnataka, where a project covering four districts is under preparation.

The allocation of funds to the various projects is as under:

	Rs.(Million)	Rs.(Million)
ANDHRA PRADESH		
Phase I	182.550	
Phase II	288.940	
Complementary projects	62.090	
		533.580
GUJARAT		
Santalpur I Scheme	99.500	
Santalpur II Scheme	94.800	
Sami-Harij Scheme	225.100	
Lathi-Liliya Scheme	66.000	
		485.400
KERALA		
Vakkom-Anjengo	42.250	
Nattika-Firka	117.600	
Mala	34.100	
Thrikkunnapuzha	2.414	
Koipuram	9.200	
Cheriyyanadu	4.200	
Kundara	71.200	
Pavaratty	174.600	
Socio Economic Units	52.484	
		508.048
UTTAR PRADESH		
Sub-Project I	165.300	
Sub-Project III	110.438	
Sub-Project IV	112.560	
Sub-Project V	30.000	
Sub-Project VI	224.300	
		642.598
KARNATAKA		250.000
Total Allocation		<u>2,419.626</u>

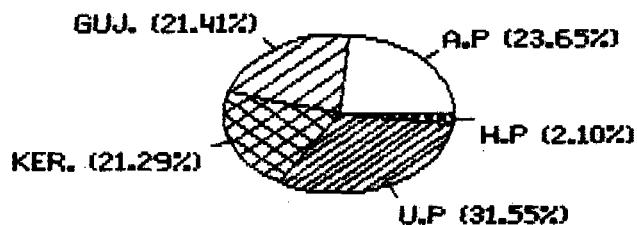


**TOTAL EXPENDITURE PER STATE
(UPTO THE END OF 1989)**



**NOTE : DISBURSEMENTS TO HIMACHAL PRADESH
ARE ON ACCOUNT OF PREVIOUS PROJECTS
WHICH HAVE BEEN PHASED OUT.**

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