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NETHERLANDS ASSISTED PROJECTS - ANDHRA PRADESH
AP III - NALGONDA - PHASE 1

INSTITUTION DEVELOPMENT COMPONENT
ACTIVITY 2: MANAGEMENT INFORMATION SYSTEM DEVELOPMENT

TOTAL COST: Rs. 125.00 LAKHS
PHASE 1: Rs. 93.75 LAKHS

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NAP-AP III

NALGONDA

COMPONENT:
INSTITUTION DEVELOPEMENT.

PART. 2:
M.I.S.

JUNE 1991

1. RURAL WATER SUPPLY AND SANITATION SECTOR SCENARIO:

1.1 Background:

Andhra Pradesh is the fifth largest state in India (70 million people and surface area 2.77 lakh sq km). 3/4 of the state is rural, with 50 million people living in 27,379 villages and 35000 hamlets, in cluster habitations widely scattered all over the 23 districts. At the fringes of these villages are the harijanwadis (about 10 million people) and the isolated tribal thandas (about 5 million tribal population).

1.2 Sector Interventions:

RWS/S sector is three decades old. It started with borewell programmes for drought hit districts and has steadily grown over the years. Investments are estimated at Rs.543 crores.

Out of total 27379 villages, 22860 problem villages have been identified. By the end of VII plan (April 1990), 17316 problem villages were covered through 1.60 lakh bore wells and 8067 FWS schemes and 5 CFWS schemes. The balance 5544 problem villages are planned to be covered during the VIII plan.

With falling ground water table, bore well schemes are now yielding inadequate supplies. This adds annually to the list of problem villages under the category of scarcity. Further fluoride/salinity affected areas have to generally depend on surface water sources. These problems have placed heavy resources constraint on the Government. It is hoped that external assistance can be mobilised in a bigger way to meet the challenges. The PRED is also gearing itself up to meet the growing demands and challenges in the sector.

1.3 External Support:

External interventions in rws/s are limited to Netherlands, UNICEF, and now the World Bank. Netherlands inputs over two phases (1979-1991) have been Rs. 51.50 crores for covering 489 villages in 8 districts with 16 CFWS and 83 FWS schemes. A lift irrigation scheme is also taken up, at a cost of RS.8.5 crores. Apart from this, NAF has committed Rs. 7.80 crores for the support activities. The World Bank credit of Rs.50 crores is to cover rehabilitation of 328 cyclone affected schemes and construction of 30 CFWS (covering 200 villages) schemes in cyclone-prone coastal districts. The borewell programme has been supported largely by UNICEF.

1.4 Technology:

The technology adopted for FWS ranges from simple handpump fitted borewell to complex comprehensive scheme covering a population of over 1.25 lakh (111 villages), with treatment units, large pumping mains, overhead service reservoirs, intermediate booster stations, and internal distribution through public standposts. The treatment units range from disinfection with bleaching powder to rapid sand filtration followed by disinfection (primary and booster). Under the Technology Mission, desalination and defluoridation plants are also being introduced.

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1.5 Sanitation Interventions:

Coming to sanitation inputs, the policy has been to spread thin the meager resources. The programme (Vimukthi) was launched in 1983. Investments have been Rs. 14 crores and facilities provided 1.07 lakh individual and 1500 community latrines.

Though achievements substantial in comparison with financial inputs, impact is low. A renewed programme is being attempted with the involvement of UNICEF, voluntary agencies to create awareness, and by adopting intense coverage approach.

1.6 Budget:

The annual budget of the department (for all works) is around Rs.300 crores, of which allocation for rws/s is around Rs.50 to 55 crores. The sources of funds for rws/s are: centrally sponsored ARWS, state sponsored MNP (bilateral funds are included under this head), special programmes such as DPAP etc. About 21% of works funds are earmarked for SC component and Tribal sub-plans.

The allocation under the VII plan had been Rs.224 crores for RWS and Rs.17 crores for sanitation. Under the VIII plan, the proposed outlay for RWS is Rs.450 crores, and for sanitation Rs.25 crores. This includes anticipated inputs from bilateral assistance, and World Bank. Outlay include HRD (Rs.1.00 crore), MIS (Rs.2.00 crores) O, M (Rs.25.00 crores), water quality monitoring (Rs.3.45 crores), community participation (Rs.1.00 crore).

2. CRITICAL SECTOR ISSUES:

2.1 Operation and Maintenance:

The most critical issue now being faced by FRED is the operation and maintenance of the RWS assets created, and to be created.

The present practice is to hand over the scheme to the Gram Panchayat after its completion. The GP is expected to maintain the scheme with its own resources and man power. All except major panchayats are exempt from electricity charges on FWS schemes. FRED is responsible only for breakdown maintenance, and for periodic corrective/ preventive maintenance and monitoring. Often the GPs have neither the financial resources nor employ technical personnel to manage a scheme, especially when it involves treatment units, pumps and large distribution net work. Some of the schemes operate below acceptable standards.

At mandal level, a junior engineer is to be responsible for all water supply schemes (average no. of schemes: 15 to 20). But, due to inadequacy of staff, the junior engineer responsible for the GP works has to look after also rws. Infrastructure, mobility and resources at his command are inadequate.

2.2 Inadequacy of Ground Water Sources:

Excess fluoride, salinity/brackishness and scarcity constitute the main source problems. Further, most of the bores, especially in the interior districts of Rayalseema and Telegana fail during summer. Unregulated tapping of ground water for irrigation compounds the problem. PRED is now of the opinion that only tapping of the surface sources (rivers/reservoirs/irrigation canals) can provide lasting solution to the water supply problems in the state.

2.3 Institutional Memory:

In a generalist department, it is inevitable that specialisation suffers. Consequently, skills and capabilities for planning and executing, and more important, for maintaining water supply schemes do not easily get institutionalised. Cumulation of experiences, and learning from one's own and from others' mistakes become difficult.

Such lack of specialisation has backward linkages on the quality of work and down stream repercussions on articulation of need for specialisation, in-service learning, improved institutional set up for design, construction, monitoring, O/M etc.

In sum, institutions and procedures have not been reshaped to suit the changed sector reality - from simple borewells to more complex piped water supply systems, which require specialist skills in planning and execution, and a totally different approach to O/M.

2.4 Institutionalisation of Integrated Approach:

The integrated approach to water supply and sanitation advocated by the Netherlands Government and by the IDWSSD has now been adopted by the Government of India as the strategy to be adopted for all rural drinking water supply and sanitation programmes. Hence it is critically important that the PRED is equipped with know-how and institutional capabilities for planning, executing, maintaining and monitoring integrated water sanitation projects.

2.5 Improved Information Management:

PRED is likely to be up against even faster rates of growth than during the eighties. In view of the fact that GOI/GOAP has begun to earmark 50% of all its development funds to rural development, the work load on PRED is certain to increase. Consequently PRED has to recruit more engineers who will swell the present ranks to about 4000. Larger NAP schemes, the on-going CERP, UNICEF and NAP sponsored sanitation projects, will also add to the demands made on the department.

PRED will be required soon to function in a more complex organizational set up than hitherto owing to the adoption and promotion of the integrated approach to RWS/S adopted by GOI and GOAP. This will call for more participatory attitudes, work methods and procedures, that in some measure are extraneous to a techno-oriented culture and its rigid hierarchical relationship.

PRED has not been restructured along functional lines. Nevertheless, RWS projects will require ever more specialized know-how and experience

for planning, design, construction management and effective operation and maintenance.

It is not as though PRED does not have an information management system. There is a system that has been in existence over last 3 decades. It is manually processed and has become cumbersome due to the extensive growth of data, and due to the need to generate/ monitor information on a larger spectrum of indicators: technology, finance, management, training, operation, maintenance, community participation, health and hygiene, water quality, water resources, sanitation, coordination with other rural development departments, socio-economic and demographic data, etc. Also the reporting requirements are also growing rapidly in quality and number of agencies seeking information.

Hence there is the need to study and introduce into the department state of the art information management technology, so that the existing data base can be made more functional and efficient, especially in the areas of updating, retrieval and analysis for , perspective planning and decision making.

3. NAP INTERVENTIONS IN AP

The Royal Netherlands Government has been supporting the Government of Andhra Pradesh with bilateral assistance for meeting the targets of the International Drinking Water Supply and Sanitation Decade.

3.1 Objectives of NAP Intervention:

- a. To support the GOAP in its efforts to provide protected drinking water to identified problem villages within the frame work and strategies of the IDWSS.
- b. To further enhance the effectiveness of the project through the introduction of an integrated approach involving multiple inputs from various specialist agencies.
- c. To support institution development efforts of PRED and other collaborating agencies to equip them to adopt an integrated approach to water and sanitation, at the sector level.

3.2 History of NAP Intervention:

Under Phase I (1979-1990), 201 villages were taken up in 6 districts at an original estimate of Rs.1441.00 lakhs (later revised to Rs.1825.51 lakhs). The schemes are almost completed and administrative closing report is being finalised. During this phase 4 Comprehensive Protected Water Supply Schemes (CFWSS) and 50 individual schemes (FWS) have been taken up.

Phase II was taken up from 1988 and is to be completed in March 1993. 288 (including 54 enroute villages) villages in 4 districts are to be covered through 12 CFWSS and 33 FWS schemes. 10,000 acres of land are to be irrigated through a Lift Irrigation scheme. The sanctioned estimate for these second generation projects is Rs.2889.40 lakhs (now

being revised to Rs.4238.00 lakhs). Under Phase II, in keeping with the integrated approach recommended by the IDWSSD, and subsequently adopted by GOI, support activities such as community education and participation, health awareness, sanitation, income generation, external water quality monitoring, consultancy support for various activities etc. are being taken up at a sanctioned estimate of Rs.780 lakhs. The estimate for these components is likely to be revised to Rs.900 lakhs.

3.3 Institutional Arrangements for Overall Coordination:

- a. State Level: Apex Steering Committee headed by the Chief Secretary
- b. Nodal Agency: FRED headed by the E-n-C (FR) (assisted by the NAP Cell in the office).
- c. Dist. Level: Exclusive NAP-FRED Circles (2) and Divisions (5). The Superintending Engineer is the chairperson of the District Project Committee involving District level project agencies and health/education departments.
- d. Proj. Level: The Executive Engineer is the Chairperson of the Project Coordination Committee involving the PRED and NGO.
- e. Vill. Level: The Village Action Committee being set up by the NGO and involving the community, GP, FRED ground level operators, school teachers and PHC staff.

3.4 Third Generation Projects:

4 third generation projects are under various stages of formulation for covering more than 1200 villages/hamlets in four (Nalgonda, Prakasam, Ananthapur and Krishna) districts. The anticipated project cost will be Rs.275 crores, including all cost escalations during the project execution period of 8 to 10 years.

Project Components include:

1. Technical Component: construction of water supply scheme
2. Community Based Support Activities:
 - community participation and health education
 - income generating activities
 - mother and child welfare
 - sanitation
3. Institutional Development:
 - human resources development
 - management information systems
 - strengthening of planning/monitoring/design cell
 - support in developing sustainable and community based operation and maintenance systems

These third generation projects are much more ambitious in nature, both in terms of coverage and costs. Unlike the two previous projects, the department has given considerable attention to the formulation of the project, drawing lessons and experiences from the past. Voluntary organisations and other governmental agencies are being involved right from the outset to ensure that the project has inbuilt provisions for the active involvement of the community and to ensure that the project will indeed go to enhance the quality of life and health standards of the community.

Though preliminary proposals for all 4 projects have been presented to RNE through GOI, after detailed discussions with the RNE, it was decided that the Nalgonda project would be taken up first for more detailed project formulation. Given the cost of the project, it was also agreed that each proposal would be reworked as two-phased.

3.5 Significance of NAP Interventions:

In terms of financial inputs and physical coverage, NAP contributions are limited. NAP inputs will probably be no more than 15 to 20% of annual sector investments, given the present RNG resource allocation for the sector.

Hence, the contribution of NAP to rws/s sector in AP is to be measured not so much in terms of the capital investments, but more for the new perspectives, capabilities... that NAP has contributed to generate, within the sector. The approach, the areas of intervention, and the interactions themselves are as important as the quantifiable achievements.

4. AP III - NALGONDA

4.1 Outreach:

Nalgonda district consists of 1141 revenue villages and 1812 hamlets in 59 mandals. The District has a population of 29.40 lakhs, and is spread over an area of 14,240 sq.kms.

4.2 Coverage and Phasing:

The project will cover a 1981 population of 375,380, a 1992 population of 482,655, and an ultimate 2022 population of 877,370.

It is planned to take up the project in two phases, keeping in mind both technical and financial parameters. 82 villages and 99 Hamlets are to be covered in Phase I. Of these, 76 villages are fluoride problem villages, 6 are scarcity problem villages. 144 villages and 238 hamlets will be taken up in Phase II. Of these, 94 are fluoride affected and the balance 50 are scarcity problem villages. Details regarding population coverage are provided below:

Zone	Vil	Hmlts	1981	Population 1992	2002
Phase1	82	99	174940	225677	400000
Phase2	144	238	200440	256978	469370
	226	337	375380	482655	877370

4.3 Project Components:

The project components are broadly categorised as:

- Technical Component (water supply construction)
- Community Based Support Activities
- Institution Development Support

COMPONENT	NODAL AGENCY	BUDGET	TIME SCH
Water Supply	PRED	9742.000	6 years
CEP/HEP	NGO (ASM)	96.569	5 years
Sanitation	PRED/ASM	950.000	6 years
Income Gen. (Dairy)	NARMUL	347.000	4.5 years
IG (Sericulture)	SERIFED	151.760	5 years
Mother and Child Dvpnt	ICDS	198.400	4 years
MIS Development	Consultancy	125.000	4 years
Human Resources Devpt.	PRED(RDTC)	894.880	5 years
8 components	6 agencies	12505.609	6 years

4.4 Institution Development Component:

This component (human resources development, and support for an MIS development for improved monitoring of integrated approach and interagency coordination) aims at enhancing the capacity of the PRED to plan, implement and monitor an integrated and participatory approach to water and sanitation, first within the NAP environment, and eventually at the total sector level. The estimated cost of the two components is Rs. 1019.880 lakhs. The cost sharing pattern proposed is: RNG - 75%, GOAP - 25%.

4.5 Estimates for Phase 1:

The cost of Phase 1 is projected at Rs. 5364.410 lakhs (43% of total project cost). Abstract is provided below:

- Water supply	: 3863.000 lakhs
- Comm. based actvts	: 870.730 lakhs
- Insttnl. Devpt.	: 630.680 lakhs

	5364.410 lakhs
	=====

4.6 Budget for Institution Development under Phase 1:

COMPONENT	TOTAL COST	COST OF STAGE I	RNG SHARE	%	GOAF	%
HRD	894.88	536.93	402.70	75%	134.23	25%
MIS	125.00	93.75	70.31	75%	23.44	25%
TOTAL	1019.88	630.68	473.01	75%	157.67	25%

4.7 Rationale for Inclusion of Institutional Development under Nalgonda:

Though institution development is aimed at the sector and particularly PRED as a whole, this component is included under AP III - NALGONDA for administrative reasons. However the planning, implementation and monitoring of this component will receive separate attention as discussed in later parts of this document.

Further, AP III - Nalgonda will provide a good field laboratory for testing the validity, efficiency and impact of the several activities to be initiated.

6. INSTITUTION DEVELOPMENT:

6.1 The Concept:

The International Drinking Water Supply and Sanitation Decade (1981-90) had advocated an integrated approach as the strategy for the planning, execution and operation/ maintenance of rural water supply and sanitation programmes.

The integrated approach requires that the nodal activity of providing water and sanitation infrastructure be coordinated and supported by a spectrum of complementary activities, health and hygiene education, awareness regarding water collection/storage/use, effective operation and maintenance, O/M cost sharing, water quality surveillance, sanitation activities around water supply widening out to cover personal, domestic and environmental hygiene, income generation and other women and children oriented development programmes, organisation and education of the people - all designed to ensure the responsible participation of the community in the programme.

The sector agency responsible for water and sanitation was to take the initiative to develop the strategies and operational plans for such integrated approach, identifying and involving various specialist agencies (governmental and non-governmental) and co-ordinating, monitoring this inter-agency intervention.

The Delhi Declaration of 1990 (Some for All Rather Than All for Some) has once again underlined the validity of this approach. Further, the Governments of India and Andhra Pradesh have taken policy decisions to adopt integrated approach for the total rural water/sanitation sector.

6.2 Netherlands Support:

The Royal Netherlands Government, one of our major external support agencies, has been advocating and funding the integrated approach for the last 3 to 4 years. RNG has now made it mandatory for further projects to be eligible for support that they have an integrated character and an explicit orientation towards community participation in project planning, execution and subsequent maintenance. Though the NAP Office will continue to support PRED in these areas, the draft policy framework for the 1991-2000 decade stipulates that within a mutually agreed to time schedule, the department take over the primary responsibility planning, executing, co-ordinating and monitoring the integrated approach.

However, the RNG has also indicated that PRED may seek financial and technical support for enhancing its capability for functioning as the pivotal agency for the integrated approach to water and sanitation. 10 areas when support could be availed of have been indicated in the discussion paper on "Institution Development Support", and the "Draft Policy Framework" indicates technical and programme support funds that may be tapped towards institution development. On an average 25% of the cost of all future projects posed to RNG is to be earmarked for complementary activities, which may include apart from community based development programmes, also institution development programmes for the department and other partner agencies.

6.3 The Challenges Ahead:

Apart from the limited objective of taking full advantage of the support offered by RNG, both the present sector realities and the challenges that lie ahead should be the real motivator for launching institution development projects:

- a) a growing shift from simple handpump technology to more complicated comprehensive piped water supply schemes, necessitated due to falling ground water tables, problems of fluoride and salinity in ground water and also equally by the demand from the public for higher levels of service.
- b) increased consciousness on the quality and reliability of the services being provided
- c) increased sector budget allocation and consequently the growing number and diversity of projects and assets to be maintained.
- d) the departmental responsibility for proper operation, up-keep, replacement and upgradation of services provided.
- e) the need to address sanitation issues much more realistically, to ensure that the health benefits of improved water supply really reach the people.
- f) the need for efficient, reliable and update information and data management for planning, monitoring, execution and operation/maintenance of schemes.
- g) the absolute need to involve the community in cost/ responsibility sharing for execution and O/M.

6.4 Areas for Institution Development Support:

PRED has identified some areas where the sector level interventions are required:

- a) community based and sustainable operation and maintenance of RWS
- b) institutionalisation of integrated approach by building up expertise on water and sanitation with NGOs
- c) improved monitoring/coordination with its connected components such as improved management information system (MIS), standing institutional arrangements for review/programme reorientation. This calls for a systematic approach MIS development.
- d) developing the knowledge, skills and attitudes both technical and human of the personnel of the department so that their capability to address themselves to the demands and implications of integrated water supply and sanitation projects can be enhanced. This calls for a systematic approach to human resources development (HRD).

structure (specialisation)
Dept/Staff

Enhanced performance is critically dependent on the building up of capabilities and institutions in the above five areas.

6.5 Approach to Institution Development:

During discussions with the First Secretary and Sector specialist, - Mr. Peter M. Flik - at Hyderabad, it was agreed that the total concept of Institution Development would be taken up for serious study during a workshop involving PRED/NAP Office/RNE/Review and Support Mission.

During this workshop, it is hoped that the concepts, strategies and operational plans for institution development can be spelt out and later documented, with clearly defined task allocations and time schedules and monitoring mechanisms.

It was also agreed that PRED may make project proposals for further activities not covered under the HRD and MIS proposals, independent of Water/Sanitation project proposals.

As such, this document outlines the PRED proposal for only one of the components under institution development - Support for MIS DEVELOPMENT. The second component - HRD - also taken up under AP III - NALGONDA is discussed in detail in a separate document.

7. ORGANISATIONAL SET UP OF PRED

7.1 Organisational Set Up for Rural Development Tasks:

The Ministry of Panchayati Raj and Rural Development is responsible for all rural development activities in Andhra Pradesh. This excludes 4 cities and approximately 90 municipalities that come under the jurisdiction of the Ministry of Urban Development.

The Panchayati Raj & Rural Development Department has two wings; the Panchayati Raj Commissionerate (PR&RD) and the Panchayati Raj Engineering Department (PRED). The whole department is headed by a secretary assisted by additional, joint/ deputy secretaries. Both the wings report to the Secretary who in turn reports to the Chief Secretary.

A District Collector is the head of a district and is responsible for coordinating activities at that level; for maintenance of law and order, revenue collection, developmental activities and in matters of protocol. He reports to all secretaries involved in different development activities, particularly to the Commissioner and Secretary of the PR&RD.

A District Development Officer is next in line, directly charged with the responsibility for planning, coordinating and monitoring all rural development activities, including water supply and sanitation programmes. He reports to the District Collector, ZPF, to the Heads of departments and to the Government.

Each district is divided into 30 - 50 Mandals. At the Mandal level there are two assistants: the Mandal Revenue Officer and the Mandal Development Officer. The MDO is specifically responsible for rural development works.

Each Mandal is subdivided into 5 to 15 Gram Panchayats, each consisting of a main revenue village and a few hamlets. Both the MRO and the MDO are assisted at Gram Panchayat level by Village Assistants (Village Administrative Officers), and Village Development Assistants.

The District, at the political plane, is governed by the Zilla Praja Parishad (ZPP). In each Mandal, a chairman heads the Mandal Praja Parishad (MPP), while at Gram Panchayat level (GP), a committee is chaired by a Sarpanch. Direct elections determine the compositions of the Gram Panchayats and the Zilla Praja Parishad. These constitute the ground level institutions under Panchayati Raj set up (local administration).

7.3 PRED: the Engineering Wing of Panchayati Raj

The task of providing safe drinking water and sanitation facilities for the rural population is vested with the Panchayati Raj Engineering Department. PRED is also the engineering wing of the Panchayati Raj, with responsibilities for: rural infrastructure development such as construction and maintenance of school buildings, health centres, panchayati raj buildings, minor irrigation works, panchayat roads etc. As the engineering wing of the panchayati raj institution, PRED is also accountable to peoples bodies and district administration.

7.4 Organisation:

The department has at the moment 4 Chief Engineers, 20 Superintending Engineers, 95 Executive Engineers, 2500 graduate/diploma holder field engineers and a large number of technical and administrative support staff.

At the state level the Chief Engineers are responsible for specific sectors of activities. At the district, division and sub-division level, the monitoring and implementing staff are responsible for all activities and report to all CEs. At the field level (mandals), one junior level engineer is to be responsible for gram panchayat and mandal works and another for Zilla Praja Parishad works and rural water supply/sanitation.

Administration is with the seniormost Chief Engineer, who has the rank of Engineer-in-Chief.

Each CE has support staff, such as in the task cells for projects sponsored by the Netherlands, the United Kingdom (school building program); Technology Mission, Rural Sanitation, Vigilance and Quality Control, Monitoring, General Administration, Rigs Workshop, Training, etc. These cells are headed by SEs/EEs.

HRD study:

need to study
time division/
workload for rws/
other tasks to
see if spec. RWS
required/feasible?

Next in line are the Superintending Engineers (SE). They are accountable only to the CEs, as there is no functional sub-division within PRED on the basis of the type of work. All staff within PRED can be assigned to any type of civil engineering work at any time. Each SE supervises 2 districts (circle).

Each circle is subdivided into three to eight divisions, which are headed by an Executive Engineer (EE). The EE is in charge of approximately 10 Mandals. The EE reports both to the SE and to the District Collector/DDO. The EEs have administrative and technical support staff to assist them at the division level.

EEs are assisted by Deputy Executive Engineers (DEE) at sub-division level covering around 3 to 4 Mandals. Below this level are the section officers: Assistant Executive Engineers (AEE - graduates) and Assistant Engineers (AE - diploma holders), who are in charge of 1 to 2 Mandals, or 10 - 15 villages. They are assisted by technical staff.

All levels down to AEE/AE are bound by the D (Department) and F (Financial) codes. Each EE has a non-technical office manager, a Divisional Account Officer, who assists the EE in maintaining compliance with the D and F codes.

Only the EEs are cheque-drawing officers with district treasury accounts. The EE may delegate this power to the DEE.

The EEs form the executive backbone of the department and are the pivotal agents for the whole of the rural infrastructure. Officers in PRED above the EE - the SE and CE - do not have direct project implementation responsibilities, but are monitoring officers. The EE is responsible for records and is accountable to his own superiors, to the district collector, to other departmental officers and to ZFP.

8. THE MODE OF OPERATION OF FRED

8.1 Budget Planning:

The FRED, like all other departments, prepares work plans and budget requirements for each five year plan. Once this budget is approved by GOI/GOAP, annual budgets based on the five year plans are prepared by the CEs, consolidated at the Secretary level, and presented to the government, which in turn presents it to the Assembly as part of the state annual budget. Based on the approved budget, the CE allocates funds to the EEs, depending on the projected workload for the year. Funds are released quarterly.

8.2 Execution of Works:

Public works are awarded to private contractors after tender procedures. Each contract has to be registered in a particular class of works before he can participate in tenders. There are 7 categories. Each class has limits as to the value of contracts that can be entered into. The Board of CEs, CE, SE and EE all maintain registers of contractors.

After signing the Andhra Pradesh Standard Specifications (APSS), a contractor receives a certificate of registration, which is valid for undertaking works in any department within AP in his particular class. This certificate has to be renewed after five years. A contractor who has been awarded a contract, enters into an agreement that is recorded in an agreements register. It is kept by the EE or DEE, depending on contract value. Each entry in this register has a unique number that serves as a link between the work and the contractor.

MIS: Work done by the contractor is recorded in the M-books of that particular work, as well as all issues of materials and payments to him, together with checks, superchecks and corrections made.

8.3 Procurement of Materials:

All major materials used in a project are procured directly by PRED, such as cement, steel, pipes, pumps and spare parts. These make up 60 - 65% of the total value of a RWS/S project. Small items are purchased by the contractor, but these will be specified earlier in the contract agreement and the tender documents.

MIS: Centrally procured materials are entered in a stock register, which are kept at project level as they involve bulk purchases. The materials are usually kept in the godowns of the field DEEs, but are sometimes stored temporarily in EE, or DEE - HQ godowns. Issue of these materials to the contractors are recorded in the M-book.

The existing procedure of classification of inventory of materials requires more standardised classification.

8.4 Monitoring/Reporting:

Financial progress monitoring is done on the basis of a comparison between quarterly releases, targets and actual expenditure incurred during these periods. Physical progress monitoring is carried out at

works level. Depending on the type and stage of work, different assessment methods are in use.

In RWS schemes head works are categorised as being 25%, 50%, 75%, 100% complete. Typical milestones for overhead storage tanks are bottom slab (30%), side wall (70%) and top slab (100%). Progress on transmission and distribution lines is monitored on the basis of length of pipes laid and jointed and length of pipes tested.

All large water supply schemes are broken up into a number of works. Depending on the size of the scheme, there may be several intermediate levels for purposes of aggregation and monitoring. In a borehole-cum-handpump scheme, typical for UNICEF, or a mini protected water supply (MFWS) scheme consisting of a bore well, an overhead storage reservoir and a battery of taps, there are but a limited number of works. These usually are monitored as one scheme. In larger protected water supply scheme, with one source of water, water treatment and pipe distribution to one/two village (FWS) there may be several components with a number of works. Monitoring is then done at component and work level.

In comprehensive protected water supply schemes (CFWS) with one source of water, several water treatment, and pipe distribution to more than one village, there may be geographic zones, subdivided into components with further sub-divisions into works. Here monitoring is conducted at three levels; by zone, by component and by work.

Each project is recorded in a public works register, with a unique name and the address of the DEE. Each project has one or more works (with intermediate monitoring levels, as mentioned above). Every individual work is entered into a sub-divisional register of public works. This list is carried to higher levels in FRED, where it is aggregated with those from other areas.

Each work must be technically approved and financially sanctioned by the competent authority. Depending on the size and cost of the work, the required sanctions can be granted by the EE or SE, while the CE has unlimited powers when projects are prepared. All sanctions are entered into a register, called the technical sanctions register.

8.5 Records Maintained:

Each public work has one or more M-book, or Measurement-books, which are recorded in the sub-divisional register of M-books. M-books come in three types, with 25, 50 or 100 pages. Each M-book has a unique code within a district. The book is kept under the custody of the Assistant Executive Engineer, and has legal value. The M-books contain all financial budgets and technical descriptions, payments stages, actual payments and physical progress checks to be made. They serve as repositories of all sorts of transaction in connection with the execution of a particular public work. It is on the basis of these M-books that many additional registers are maintained and updated. Information that uniquely identified each M-book includes Mandal name, village/ward, name of work and name of executing contractor or agency.

M-book do not go above the levels of DEE or EE for payment sanction and monitoring checks and superchecks, but up to the highest level depending on value for revision of estimates.

All accounting done at DEE and EE level and all financial and physical progress monitoring information is derived from the M books. Abstracts from the M-books are forwarded to the highest level by means of standardized monthly and quarterly proforma reports.

However, it might be feasible that the rich data available from the M-book data can be used for systematic data base development, monitoring and for aggregation/forwarding and for data analysis.

A number of additional registers are also maintained. Some of the records related to FWS/S are listed below:

- Unstamped receipt book (U.S.R.)
- Receipt for materials to Contractors
- Register of works
- Contractors ledger
- Register of payments to contractor
- Stock Register of M-Books
- Materials register of M-books
- Register of agreement
- Register of contractors
- Return showing receipts/issues/balances of materials at site
- Annual register of receipts and issues of balances of materials at site
- Register of work bills
- Register of wells
- Register of FWS schemes
- Register of works check measured and supra-check measured
- Central stock register at EE level
- Technical sanctions register
- Tender disposal register

10. EXISTING MONITORING AND REPORTING SYSTEM

Monitoring is carried out at all levels of PRED's hierarchy. The prime source of monitoring however is the M-book. The Assistant Executive Engineer keeps it at section level. For every public work undertaken, the M-book carries all relevant information, and ultimately all reporting data are derived from it. However a lot of potentially useful data in the M-book never enters the monitoring data stream, though data summarizing and aggregation is done at division (EE) level.

Periodic reporting at monthly and quarterly intervals is carried out both within the department, and outside the department to the District Collector (partly for district computerization purposes), to the Zilla Praja Parishad, to the Governments of India and AP, and to bilateral (the Netherlands, United Kingdom) and multilateral donor organizations (UNICEF, World Bank) for specific projects. In addition ad-hoc reporting is done to GOAP.

Owing to the adoption and promotion of the integrated approach by the GOI and GOAP, PRED's coordination and reporting responsibilities towards other organizations is bound to increase further in the near future.

Currently PRED has to separately report on a number of programmes that are executed in AP. These comprise among other:

- the Minimum Needs Programme (MNP), also for the Scheduled Castes and Tribes and separately for borewells, protected schemes and for maintenance
- the Accelerated Rural Water Supply Programme (ARWSP)
- the Advanced Plan Assistance Programme (APA)
- Technology Mission schemes relating to guinea worm, brackishness, iron and fluoride content, and rain water harvesting structures
- NAP schemes, under NAP I and II and proposed NAP III
- Schemes under the Andhra Pradesh Cyclone Emergency Reconstruction Programme (APCERP)
- Sanitation programmes under the poverty alleviation programmes such as the Rural Landless Employment Guarantee Programme (RLEGP), National Rural Employment Programme (NREP), CRSP, NAP, UNICEF and under State Sector Programme.

At EE level monthly reporting is done manually on the basis of a large number of pre-printed forms. These forms often carry data redundancies and are subject to periodic revisions, depending on additional data sought by the agencies concerned.

The flow of information from the districts has over the past years grown so rapidly and to such magnitudes that it has become a difficult proposition to meaningfully manage, retrieve, analyze and interpret the data. So much so that the higher levels of monitoring are in effect dependent on the divisions for new/updated/ consolidated information, even if such information may actually be available in some form or the other.

At the division level, the same process is repeated, and often information is again called from the field. And the data has to be filled in prescribed proforma and requisite copies made. All this manually. Even changes in small pieces of information requires time-consuming work. This makes information generation a very tedious and time consuming activity.

Due to inadequate training in information management, at all levels data storage, updating and retrieval have become very difficult and are often neglected. The approach in general is to respond to specific information demands, by generating them at that time. All this is due to lack of facilities in compiling and analysing data at various levels to arrive at manageable information for decision making, planning and monitoring. Add to this the fact, that personnel are not equipped to build data bases on several other significant aspects such a community participation, health impact, etc.

11. INFORMATION REQUIREMENTS

11.1 The RNE had in 1988/89 developed a conceptual outline of the MIS indicators for an integrated approach to water supply and sanitation sector. This draft document was discussed with PRED. It was pointed out that the document could serve as an excellent indicator of the information requirements, even though it needed conceptual and operational definition before application in the field.

It was further pointed out that the PRED would not be in a position to provide information on most of these indicators, simply because the existing information system does not address itself to these parameters.

In consultation, with RSM/NAFO/RNE, it was agreed that PRED/NAFO would draft the Terms of Reference for an MIS consultancy to RWS/S - AP.

11.2 The consultancy is to be addressed to the information needs, systems and their management in RWS/S - AP, from the perspective of RNE's needs, as much as those of the concerned agencies involved, particularly, PRED. The consultancy should analyse and assess present reporting systems and make proposals for strengthening and upgrading them into an efficient MIS.

11.3 The MIS will cover the entire RWS & Sanitation sector. The Department is looking for an integrated and comprehensive MIS than for the mere computerization of existing Database and information systems.

11.4 Consultancy Tasks:

a. Problem Definition

Elaborate the problems connected with the need, development and management of MIS. The problems should be defined also in relation to the MIS working document of RNE and should cover the following areas:

- Water Supply
- Operation and Maintenance of water supply systems
- Water Resources Monitoring
- Sanitation
- Income generating activities
- Community participation
- Water quality monitoring
- Health/hygiene education
- Involvement of women
- Institutional development
- Human resources development
- Inter agency coordination
- Sustainability and spread of integrated approach to RWS/S

b. Knowledge Acquisition and System Analysis:

Assess the present reporting systems and information management practices vis-a-vis the tasks and accountability of each of the agencies.

Data capture: inventorise the availability, reliability and validity of data which are to be fed into the database (s) from which the MIS will be drawn.

Information Needs assessment: inventorise the need for information at various levels of the participating agencies.

Organisations assessment: assess the organisational and operational constraints determining the willingness and ability of the various agencies to maintain, and

c. Flexibility:

The programme should have questioning facilities for new information requirements and should be capable of further development through added on written programmes,

d. Refinement and Amplification, Installation and Integration:

Integrate the computerized and manual systems into an MIS (to extent required and useful to RNE and the involved agencies).

e. Identification of Infrastructure Requirements:

Make recommendations for infrastructure/manpower development for ensuring the use and maintenance of the MIS. Hardware introduction/installation/training could be limited to two Pilot Districts (Prakasam & Nalgonda) and to the office of Chief Engineer(RWS).

f. Training Programmes:

Plan and organise training programmes for personnel of the user agencies on all aspects of the development MIS.

11.5 Mode of Consultancy Delivery

The consultancy is a turnkey job. The MIS development could have the following broad phases:

1. System Analysis
2. System Design and Coding
3. System implementation
4. Hardware installation
5. Software installation
6. User Training
7. Software Revision/refinement & support
8. Assistance in data processing and
9. Assistance in setting up sustained system management

Of these, phases 1 & 2 should cover the entire spectrum of activities (present and future) to be covered under the system and is to be the longest and most difficult phase. It is not feasible to treat the various components like M-book, stock register, RWS inventory, integrated approach, O & M, etc as isolated units. The system analysis/design should cover the entire parameters of RWS/ Sanitation activities as being taken up now and are likely to be taken up in

not necessary:
phased acc. to
stage is possible.

future. All the requirements (including the anticipated ones) should be identified, as they have system design implications and since it is generally difficult to 'add on' new areas in to the system once it is developed.

The entire system with the manual of guidelines, software and training packages have to be validated and demonstrated as meeting the requirements, at the level of competence and efficiency sustainable by PRED.

11.6 Expertise Required from the Consultants:

- a. Social Sciences Expertise: experience in developing MIS for integrated rural development programmes, especially in water and sanitation sector proven ability in developing systems through a participatory process, involving fully the agencies and personnel responsible for data collection/processing.
- b. Computer Expertise: competence in the analysis, design and development of computer based information systems, with deep knowledge on procedures and application of database software and insight into strategies for introduction of electronic data processing in environments lacking sophisticated back up facilities.
- c. Water/Sanitation Technology Expertise:

Competence in the area of technology/management of water and sanitation in Governmental set ups.
- d. Interfacing Skills:

Ability to interface between sector and computer expertise, as that information system captures efficiently the complexities of the sector where several agencies interact at various levels.

12. STRATEGY FOR INTRODUCTION OF MIS

- 12.1 The consultants should familiarize themselves with the information and management needs under RWS/S. This familiarization should include a discussion with RNE/Department of Rural Development/ Finance department/Technology Mission/PRED and its various activities, MIS development in other states, etc.
- 12.2 Since the MIS is oriented towards enhanced programme efficiency/effectiveness, the consultancy should interact closely with personnel to be involved in the MIS, and win their support by ensuring that they have an overall understanding and commitment to the concept, strategy and need for MIS. They should also be able to appreciate the complexities of the systems within which PRED operates.
- 12.3 The consultants should begin from a survey of the existing ground realities in the data collection, use the proposed MIS, or parts of it.

12.4 System design and development:

Conceptualise and define in practical terms (including software constraints, updating procedures, etc.) the databases to be maintained by PRED at various levels. In data base(s) development, a step by step and modular approach is to be taken, to ensure correspondence with and adjustment to the growing capacities of PRED personnel.

12.5 Development of Software Programmes:

The following should be kept in mind:

Adaptability to multiple users: the software developed should be able to respond to the information demands from various monitoring bodies.

User Outputs: , the software should be able to output information in the form of tables, charts, graphs, etc. as required by the user to monitor all or specific aspects of their activities.

Data (input) Handling Facility: the programmes should be capable of being updated/modified through simple data entry.

User Interface: the programme should be user-friendly, and have facility for easy storing, reporting and retrieval. The consultants should elicit and explicitate information requirements which may not be well articulated by the persons who are actually responsible for the information.

12.6 Formal monitoring of financial/physical progress and beneficiary impact monitoring needs to be followed up and supplemented by ad-hoc diagnostic studies as a third, non-formalized component. Not all forces and developments that may interfere with a project and its benefit stream can be put under continuous surveillance. A monitoring system needs capabilities to be able to detect and deal adequately and in time with unforeseen and unforeseeable internal and exogenous circumstances and with deviations that are detected by the formal indicators. Causes, scope and consequences of detrimental (and favorable) circumstances and of deviations from planned targets need to be determined and options to counteract (or enforce) them have to be formulated.

This requires specific focus on the information suppliers. Systems designed to address the inherent management information needs of the implementing RWS/S organisations at the field level are more effective and more palatable propositions. With relatively little effort such systems can be elaborated to also suit the information needs of external organisations without over-encumbering the reporting staff.

A consequence of this approach is that the development of management information systems for implementing agencies will require time and resources, but should be viewed as an indispensable contribution to their institutional development and to a strengthening of their implementation capacity.

13. FEASIBILITY STUDY ON THE CONSULTANCY PROPOSAL

13.1 The RNE fielded an identification mission by an MIS consultant - Dr. J. LAVRIJSEN - in November 1990. The consultant had several discussions with PRED/NAPO and made a field visit to Nalgonda district to acquaint himself at first hand with the information systems as presently practiced by FRED.

The consultancy report is available.

13.2 The consultancy has positively recommended the approach suggested by the TOR jointly drafted by PRED/NAP Office. The report was also discussed with RSM 24, who recommended that RNE initiate steps to include this proposal as part of the institution development of AP III.

13.3 The consultant recommended that the National Industrial Development Corporation (NIDC), New Delhi be invited to take up the consultancy, with a dutch expert providing professional guidance/ monitoring on behalf of PRED/NAPO/RNE.

13.4 However, PRED has already pointed out during discussions with RSM and Sector Specialist - RNE, that the MIS development FRED is looking to is more than the mere computerization of existing formats/data bases. Ideally, PRED is looking for the transfer of know-how/expertise in MIS for RWS/Sanitation, as has already been developed in other countries.

Expert(s) identified jointly by the RNE/FRED/NAPO/RSM, with actual MIS development experience, are to be entrusted with the total MIS development responsibility. They should be fully involved in the entire process of system analysis, design, development, introduction and training. The expert(s) could avail of expertise in social dynamics and water/sanitation engineering as available within state/country. However the ultimate responsibility should be vested with the expert consultant.

13.5 Only if this is not feasible, PRED may go for local consultants. The approach recommended would be to float a tender for MIS development, under the over all monitoring of a team to be set up by GOAP, with the close involvement of all concerned. The Netherlands Government could field missions similar to present RSMs to extend review/support to MIS development Project.

14. TIME FRAME/COST

14.1 The time schedule proposed could be revised as:

Phase I:	System analysis, design, development and implementation18 months
Phase II:	Implementation of design12 months
Phase III:	Evaluation of total system, system refinement, institution development for system management 6 months

14.2 Priorities in system analysis:

1. M-Book related data
2. RWS Inventory
3. Project Management
4. Material Management
5. Activities under Integrated approach
6. Operation and Maintenance
7. Development of MIS under UNIX environment.
8. Handling the problem of vertical integration.

14.3 Costs:

The budget proposals are based on figures indicated by Dr.J.Lavrijsen during the identification mission:

Consultancy costs for three years:	Rs. 50.00 lakhs
External Consultancy:	Rs. 20.00 lakhs
Preparation of Manuals/Modules	Rs. 5.00 lakhs
Training/Institutional Development:	Rs. 20.00 lakhs
Computer Infrastructure:	Rs. 20.00 lakhs
Contingencies:	Rs. 10.00 lakhs

TOTAL	Rs. 125.00 lakhs

However this budget may be considered as purely indicative of the various components to be funded under the MIS development.

14.4 Cost Sharing:

During discussions with RSM 24/RNE, the following cost sharing pattern has been agreed to:

RNG (75%)	Rs. 93.75 lakhs
GOAP (25%)	Rs. 31.25 lakhs

TOTAL	Rs. 125.00 lakhs

14.5 Phasing:

It is proposed to implement the program in two phases:

Phase I (1992 - 1996): During this phase the modalities for going about the MIS development will be finalised, along with the definition of the MIS development problem. Based on this, the detailed terms of reference for the consultancy will be developed. Subsequently the consultancy will be awarded and a team will be set up for interacting/monitoring. An in-house team of PRED will also be identified for working along with the consultants to institutionalise their expertise. The consultancy will complete the system analysis, design part of the development, during this phase.

Phase II (1994 - 1998): This phase will focus on institutionalisation of the MIS and for building up system management expertise within the

FRED, specifically within the office of the E-n-C and in the Districts of Nalgonda and Prakasam.

Training will cover senior personnel as well as system designers and operators. During this phase long term training plans will also be developed and integrated with the in-house HRD plans.

15. A TASK FORCE FOR INSTITUTION DEVELOPMENT

15.1 Why a Task Force:

As discussed above, MIS is seen by FRED as an integral part of institution development. In the face of challenges ahead, FRED needs to assess its existing capabilities in terms of personnel, skills, attitudes, knowledge, resources, organisation, procedures, institutions and identify the gaps and evolve plans for bridging the gaps, so that it is geared to the tasks ahead.

Personnel involved in the day to day running of the department, do have valuable insights into the areas where FRED needs to enhance its capabilities. But they may have little time to articulate these perceptions, and much less to evolve strategies and plans to actually take on this institution development.

15.2 Tasks:

Hence a special task force will be set up for institution development, to identify areas where the department requires to change/modify/further develop procedures, systems and institutions and where engineering personnel and ground level operators require in service and specialised training. Once key problem areas are identified, the team should also come up with specific and viable strategies for responding to the problems.

Once the strategies are approved by the department, the team shall also evolve operational plans and project proposals for the same, discuss the plans with the donor agency (s) and do the needful for their positive appraisal and funding. Once the projects are funded, the team shall also guide their efficient implementation and post implementation follow up.

The task force shall also work to generate ground level support for institution development, by organising workshops, training programmes, etc. In short the task force is to act as initiators of new ideas and work to convert them into reality. In fact, given the challenges involved, institution development is to be considered as a project in itself, even if for practical reasons, funds are mobilised as part of the various water supply projects.

15.3 Some Specific Areas for Institution Development:

The following areas have been tentatively identified as indicative of the tasks of the team:

- development of an effective and efficient MIS, with the EE in the field as the nodal officer and proposing appropriate institutions for MIS management, upgradation, training of personnel, trouble shooting
- organising an effective monitoring cell for the integrated approach and giving special emphasis to o/m of commissioned schemes and water quality surveillance
- human resources development project posed to the RNE and areas where the resources available from GOI can be pooled
- developing strategies for community participation through NGOs and other peoples organisations
- developing an effective project planning/ investigation/designs cell with capability for planning integrated projects
- strategies for community based O/M, including the on-going village level water supply management study; preparation of o/m manual for Darsi etc.

15.4 It has been proposed that this task force participate in a planning workshop, in which Objective Oriented Project Planning methods will be adopted for conceptualising and operationalising the strategies for Institution development. An expert from Management Development Foundation (MDF) is to be invited as a resource person for the workshop.

15.5 During this workshop, also steps and strategies for development of MIS will receive special attention. These insights and action plans will be integrated into the MIS Development project.
