

INDIA

ANDHRA PRADESH

Netherlands
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Programme

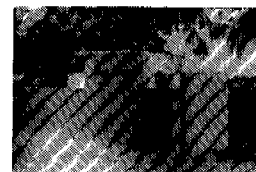
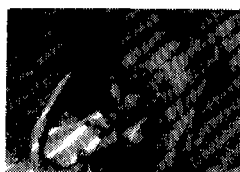
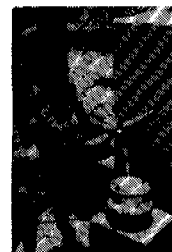
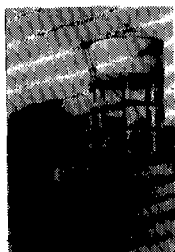
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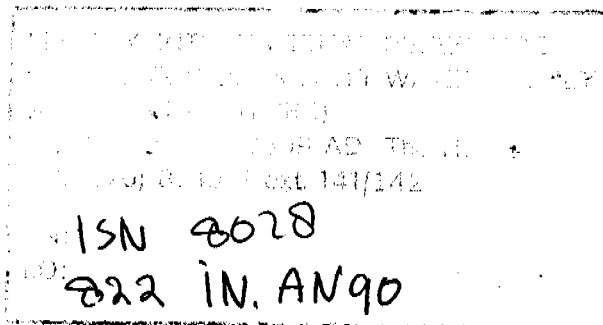


GOVERNMENT OF THE NETHERLANDS -
MINISTRY OF FOREIGN AFFAIRS
Development Co-operation Department Asia

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Report on an identification mission in
connection with the establishment of a
Management Information System for the
**Netherlands Assisted Rural Water Supply &
Sanitation Project** in Andhra Pradesh, India.

November, 1990



CONSULTANTS
FOR DEVELOPMENT
PROGRAMMES

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**This report is based on the findings of the mission which
visited Andhra Pradesh from October 15 till November 1, 1990.
The mission was carried out by J. Lavrijsen**

**The conclusions and recommendations were discussed in the field
and formulated in India as well as in the Netherlands.**

Acknowledgement

**For support provided in various ways and courtesies offered by
Indian nationals and expatriates the mission wishes to express
its appreciation.**

Glossary and principal acronyms

AEE	Assistant Executive Engineer of PRED
AP	Andhra Pradesh
APA	Advanced Plan Assistance
APCERP	Andhra Pradesh Cyclone Emergency Reconstruction Project
APDDCFL	Andhra Pradesh Dairy Development Cooperative Federation Ltd.
APPC	Andhra Pradesh Productivity Council
APSIDC	Andhra Pradesh State Irrigation Development Corporation
APTS	Andhra Pradesh Technology Services
ARWSP	Accelerated Rural Water Supply Programme
CE	Chief Engineer of PRED
CHAAP	Catholic Health Association of Andhra Pradesh
CFDRT	Centre for Development Research and Training
CHAI	Catholic Health Association of India
CIBT	Centre for Institutional Building for Training
CPWS	Comprehensive Protected (or Piped) Water Supply Scheme
CRISP	Computerized Rural Information System Project
DDP	District Development Plan
DEE	Deputy Executive Engineer of PRED
DPAP	Drought-Prone Area Programme
DRDA	Department of Rural Development Agencies
DWCRA	Development for Women and Children in Rural Areas
EE	Executive Engineer of PRED
ETC	Consultant from the Netherlands
GIS	Geographic Information System
GLSR	Ground Level Storage Reservoir
GOAP	Government of Andhra Pradesh
GOI	Government of India
GON	Government of The Netherlands
IWSSD	International Water Supply and Sanitation Decade
IPM	Institute of Preventive Medicine
IRDP	Integrated Rural Development Programme
M-book	Measurements book, used by PRED
M&E	Monitoring and Evaluation
MI	Minor Irrigation
MIS	Management Information System
MNP	Minimum Needs Programme
NAP	Netherlands Assisted Projects

NAP-AP	Netherlands Assisted Projects in Andhra Pradesh
NAPSU	Netherlands Assisted Project Support Unit
NGO	Non Governmental Organization
NIC	National Informatics Centre
NICNET	National Informatics Centre Sattelite data link
NIDC	National Industrial Development Corporation
NREP	National Rural Employment Programme
OHSR	Overhead Storage Reservoir
PRED	Panchayati Raj Engineering Department of Andhra Pradesh
PROGRESS	Peoples Research Organisation for Grass Root Environmental Scientific Research
PWS	Protected Water Supply Scheme, or Piped Water Supply Scheme
RDTC	Research Development and Training Centre of PRED
RLEGP	Rural Landless Employment Guarantee Programme
RNE	Royal Netherlands Embassy at New Delhi
RWS	Rural Water Supply Project
RWS/S	Rural Water Supply and Sanitation Project
SE	Superintending Engineer of PRED
TM	Technology Mission
TOR	Terms of Reference
TRYSEM	Training for Rural Youth for Self-Employment
VAC	Village Action Committee
WB	World Bank
WBAP	World Bank Andhra Pradesh Projects

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Introduction

A short identification mission on the feasibility and desirability of establishing a Management Information System for the Rural Water Supply and Sanitation Projects in Andhra Pradesh took place from October 15 till November 1, 1990. This included a 2-day stay in New Delhi. The Deepavali festival and bandhs restricted the number of working days in the field.

As per plan, the mission addressed only part of the annexed Terms of Reference. Attention focused primarily on the Panchayati Raj Engineering Department (PRED), in view of the fact that this organization serves as the nodal agency in the development of Andhra Pradesh's rural water supply and sanitation programmes. Its organizational structure, mode of operation and management/monitoring procedures were examined in the light of the considerable information needs of PRED itself and those of the Netherlands Assisted Project Office in Hyderabad and the Royal Netherlands Embassy in Delhi.

Thus far no attention was directed to the more limited information requirements of other organizations that collaborate in the realm of the integrated approach, nor could thought be given yet to the development of indices on the subjects of public health and socio-economic progress and performance.

Summary and recommendations

The position of PRED

1. The Panchayati Raj Engineering Department (PRED) is a very large governmental organization in Andhra Pradesh. The organization is modeled on a strictly hierarchical status pyramid and is charged with the design, construction, operation and maintenance of rural civil engineering works.
2. PRED's project management and monitoring system and reporting procedures are basically similar to those that existed before political Independence.
3. PRED has substantial accounting and reporting responsibilities, both internally, to the Government of Andhra Pradesh, the Government of India and to foreign organizations for a substantial number of programmes.
4. The growth in the volume of work associated with regular and ad-hoc reporting has increased significantly over the past decade and has become an encumbrance to field staff.
5. PRED HQ in Hyderabad is at risk of losing the capability to properly analyze and interpret the mounting flood of information from the field. It has to increasingly rely on its field offices for this.
6. PRED's growth rates will remain very high, with a projected growth rate of 33% in the near future, while the adoption of the integrated approach by GOAP is certain to make PRED's work more complex and demanding. In view of this and the observation under item 5 above, top management is liable to lose its competence in providing proper guidance to the organization. The decision that has been taken to appoint a CE for monitoring is a highly opportune one.
7. Giving consideration to a restructuring of PRED on a functional basis with the establishment of a separate RWS/S section, or the establishment of an independent body would be appropriate.
8. PRED is urgently in need of an improved and streamlined Management Information System (MIS) as part of a series of measures to make management more effective and efficient.

9. PRED has not itself initiated measures to develop and introduce an improved MIS. Several attempts by other organizations have not been successful. The chief causes of these failures are that the developers never conducted proper system studies of the actual working conditions, work procedures, information needs and accountabilities of the various levels within PRED and that the systems were primarily designed to meet the information needs of other institutions.
10. Available experience and know-how with PRED in the field of modern information technology is limited. Management appears to be insufficiently aware of the potential but also of the possible implications of the endeavour to develop and introduce a computerized MIS.

The information requirements of RNE

11. The information requirements of RNE as laid down in the working document have been defined at a level of a theoretical concept. These need further operational definitions, as confirmed by RNE, as well as the formulation of a limited set of simple yet appropriate monitoring indicators.
12. A critical re-examination of the exhaustive list is recommended to determine the minimum information requirements of RNE to ascertain relevant needs and in the light of the limited information generating capabilities of implementing agencies even after the possible establishment of a MIS.

Proposals for the establishment of MIS

13. An understanding was reached with PRED and NAP office that in a pilot development phase all NAP and non-NAP RWS projects in 2 districts (Nalgonda and Prakasam) will be included.
14. Monitoring aspects to be covered in MIS include project management/monitoring on the basis of the Measurement-books of the individual engineering works, the establishment of a RWS inventory of created assets, operation and maintenance of created assets, support to the integrated approach and materials management.
15. Vertical system integration within PRED will be effected. A monitoring unit will be established at PRED HQ, that will in the end be independently capable of system operation and maintenance. Extensive-end-user training is to be provided.
16. The mission recommends to nominate the National Industrial Development Corporation in New Delhi as the system development consultant in view of its prominent

position in the field of RWS MISs in India, and to appoint an independent MIS consultant to represent the interests of PRED, NAP/RNE and the collaborating agencies during the system development period.

17. The mission estimates that the time required to complete the MIS consultancy in three phases will be 2 years and at a cost of approximately Dfl. 1.2 million.
18. The position of Andhra Pradesh Technology Services (APTS) is to be clarified in view of its monopoly position in matters of GOAP information technology. NIDC needs to take counsel and coordinate work with APTS in view of APTS' work on a MIS for the World Bank sponsored Andhra Pradesh Cyclone Emergency Reconstruction Project, that has a sizeable RWS component.

Chapter 1

Background to the MIS identification mission

1.1 General

In order to respond to the targets and strategies of the International Water Supply and Sanitation Decade (IWSSD), the Royal Netherlands Government (RNG), through its embassy in New Delhi (RNE), supports the Government of India with financial assistance under bilateral cooperation programmes. Currently Rural Water Supply and Sanitation (RWS/S) projects are under implementation in four states (Andhra Pradesh, Uttar Pradesh, Gujarat and Kerala), with Karnataka as a fifth state to be added soon.

The chief objective of the RWS/S projects is to support the state governments in their efforts to provide protected drinking water to problem villages.

The Water Authorities of the respective states are to be the nodal agents for the design, execution, operation and maintenance of the RWS/S schemes, superinducing both governmental and non-governmental efforts. In Andhra Pradesh PRED, the engineering wing of the Panchayati Raj and Rural Development Department, serves as the Water Authority.

In conformity with sector policies, RNE supports an integrated approach to RWS/S so as to enhance the quality of the projects and of the life of the beneficiary populations, women and other disadvantaged groups in particular.

The RNE aims to set up Netherlands Assisted Projects Support Units (NAPSUs) to decentralize and delegate programme management tasks. The NAP office in Andhra Pradesh has been functioning since 1987 and has overall coordination, monitoring and liaison responsibilities.

Following recommendations by the mission on an "Evaluation of the advisory structure for the Indo-Dutch water supply and sanitation programme. Delhi/The Hague, November 1988", (the Passtoors mission), RNE has initiated the development of a Management Information System (MIS) to support the agencies concerned in improving their project management and reporting capabilities. To this end RNE also compiled a MIS working document that serves as a statement of the information requirements of RNE.

In practice however it turned out to be difficult for the cooperating organizations in the states, such as PRED in Andhra Pradesh, to satisfy RNE's information requirements as laid down in the working document on the basis of their current project management and reporting systems, thus negating the purpose of RNE's MIS.

1.2 Monitoring & Evaluation versus Management Information

Some confusion appears to exist with regard to the different intents of the concepts of 'Monitoring and Evaluation' (M&E) and 'Management Information' (MIS).

The M&E concept has in the eighties received renewed attention in the context of development projects. Although its twin aspects, monitoring and evaluation, are related they nevertheless represent discrete functions that respond to distinct requirements.

Monitoring relates to the continuous and systematic collection of information for management to assess implementation progress and take timely decisions to ensure that progress is maintained according to schedule. Monitoring assesses whether *inputs* (personnel, materials, equipment) are being delivered, are converted into *outputs* (such as a water supply scheme) as intended and are having the *initial effects* as planned (such as improved levels of beneficiary health and sanitation). Monitoring therefore is an internal project activity and an essential part of good management practice. For practical purposes monitoring is usually subdivided into monitoring of financial and physical progress and beneficiary contact monitoring to assess the (initial) effects that a project has on the target population.

Evaluation periodically appraises the *overall effects*, both deliberate and unintentional, and their wider *impact* so as to determine whether the project objectives are being, or will be, achieved. It involves comparisons requiring information from outside the project in time or geographic space. Continued beneficiary contact monitoring after project completion can provide important clues for evaluation purposes, especially when useful information from baseline and follow-up studies is available as well.

A **Management Information System** may be defined as a comprehensive, inter-related set of methods and techniques that have been specifically designed to provide a level of control over a pool of resources (people, equipment and materials), to enable the achievement of the wider objectives of an organization. The scope and goals of a M&E system usually are less ambitious than those of a MIS, and M&E may be viewed as being a MIS subsystem. Whereas M&E focuses on work that is being undertaken or that has been completed, MISs have a more general, longer term and strategic outlook. A MIS may for example include full-blown financial accounting and personnel management systems, correspondence archives, as well as ways and means to analyze current and future market positions as in the case of a commercial organization.

In the documents pertaining to MIS development for the RWS/S projects the term MIS is used throughout, though the term M&E, and then especially its 'M' part, would have been more appropriate.

The Panchayati Raj Engineering Department

2.1 Intro

This chapter highlights the Panchayati Raj of Andhra Pradesh, as it constitutes the key agency for the execution, operation and maintenance of the rural water supply and sanitation infrastructure in AP, and because its progress monitoring and reporting responsibilities have been observed to be quite substantial.

Attention will successively be paid to the organizational structure of the Panchayati Raj and its Engineering Department (PRED) and briefly to the institutional arrangements of NAP-RWS/S in a wider context. PRED's mode of operation is discussed in more detail because it will have to serve as a starting-point for the possible development and implementation of an improved management information system. The prospects for the future will also be dealt with shortly.

2.2 Organizational structure and institutional arrangements

The Ministry of Panchayati Raj and Rural Development is responsible for all rural development activities in Andhra Pradesh. This excludes 3 cities and approx. 80 municipalities that come under the jurisdiction of the Ministry of Urban and Local Administration.

The Department of Panchayati Raj and Rural Development is modeled on a traditional status pyramid, with some supporting staff functions. Strict hierarchical relationships and accountabilities are maintained internally. The organization's structure is basically similar to the one that existed at the time before political Independence.

The Panchayati Raj has two wings; one with a Commissioner at the top, while the other, the large Panchayati Raj Engineering Department (PRED) with over 3000 employees, is headed by Chief Engineers.

At the level of the State the Commissioner of Panchayati Raj is assisted by a Joint Commissioner, who in turn has a Deputy Commissioner. The Commissioner reports to the principal secretary of the Panchayati Raj and Rural Development. The principal secretary reports to the chief secretary of the Chief Minister of Andhra Pradesh.

Andhra Pradesh has been divided into three regions; the Coastal area with 9 districts, Rayalaseema in the south-west with 4 districts, and Telangana with 10 districts. 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, development activities and in matters of protocol. He reports directly to the Commissioner of the Panchayati Raj and to all other Ministries.

A District Development Officer is next in line. He reports to the District Collector and to the Deputy Commissioner at State level. Each district is divided into 15 - 30 Mandals. At the Mandal level the District Development Officer has two assistants; the Mandal Revenue Officer and the Mandal Development Officer. Each Mandal is subdivided into 5 to 15 Gram Panchayats, each consisting of a main revenue village and hamlets. Both the Mandal Revenue Officer and the Mandal Development Officer are at Gram Panchayat level assisted by Village Assistants, also called Village Administrative Officers, and Village Development Assistants.

The District, at the political plane, is governed by the Zilla Praja Parishad. In each Mandal, a chairman heads the Mandal Praja Parishad, while at Gram Panchayat level, a committee is chaired by a Sarpench. Direct elections determine the compositions of the Gram Panchayats and the Zilla Praja Parishad.

The second wing of the Panchayati Raj, the giant Panchayati Raj Engineering Department (PRED), is responsible for executing civil engineering works in the field of rural infrastructure, that is water supply and sanitation, roads, buildings and bridges and minor irrigation works. Two Chief Engineers (CE) head PRED at state level; the senior CE is responsible for rural water supply and administration, while the second CE is in charge of roads, bridges, buildings and minor irrigation. Each CE has additional support staff, such as in the task cells for projects sponsored by The Netherlands, the United Kingdom (school building programme) and soon by the World Bank (the Andhra Pradesh Cyclone Emergency Reconstruction Project). The CE reports directly to the principal secretary of the Panchayati Raj. Next in line are the Superintending Engineers (SE). They are accountable only to both CEs, as there is no functional subdivision 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, called a circle. Each circle is subdivided into three divisions, which are headed by an Executive Engineer (EE), who is in charge of approximately 10 Mandals. The EE reports both to the SE and to the District Collector. 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 1.5 Mandal, or 10 - 15 villages. They are assisted further by more junior engineers and draughtsmen.

All levels from CE 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 check-drawing officers with the district treasury accounts. Therefore each CE and SE have an EE in their office, who are called EEHQ officers. The EE can delegate check-drawing responsibilities to his Deputy EE only.

The EE officers form the executive backbone of the department and are the pivotal agents for the whole of the public 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 properly maintaining records and is accountable to his own superiors, to the district collector, to other departmental officers and to politicians.

Institutional arrangements that have been made for appraisal, monitoring, evaluation, modification and development of the Netherlands Assisted Rural Water Supply and Sanitation projects in Andhra Pradesh include an Apex Steering Committee, chaired by the Chief Secretary of GOAP, and a NAP Cell in PRED HQ in Hyderabad to assist the CE-RWS.

At district level, district project committees are to be set up under the chairmanship of the District Collector, with representatives from collaborating agencies, to decentralize planning and appraisal in order to promote people's participation.

Other arrangements outside the purview of the Panchayati Raj include :

- NAP Office, the Netherlands Assisted Projects Office in Hyderabad under the umbrella of the Andhra Pradesh Productivity Council (APPC), for inter-agency co-ordination, liaison with RNE, support to review missions, monitoring and evaluation, modification and resource support to implementing agencies
- Village Action Committees (VACs), that are being set up in all project villages

Cooperation agreements were entered into with a number of semi-government and non-government organizations, such as

- The Institute of Preventive Medicine (IPM), for external water quality monitoring,
- The Andhra Pradesh Dairy Development Cooperative Federation Limited (APDDCFL), implemented by 80 All Women Dairy Cooperatives in Prakasam District, for income generating activities,
- The Catholic Health Association of India (CHAI) through CHAAP, the Catholic Health Association of Andhra Pradesh, for communication support, and as a frontal agency for the facilitation of the sanitation programme, community organization, and water, health and sanitation education.

2.3 The mode of operation of PRED

The Panchayati Raj Engineering Department estimates the volume of work and the financial implications for a period of 5 years into the future, on the basis of 20 quarterly projections.

The financial year runs from April 1 till March 31.

An annual budget is prepared by the CE and presented to the government, which in turn presents it to the Assembly. The Assembly passes the budget. Based on the approved

budget the CE allocates funds to all levels in the hierarchy and to areas of operations depending on the projected workload for the year. Funds are released quarterly.

At project level there is an annual budget, plus a tentative financial plan for subsequent years until project completion or 5 years into the future at a maximum.

Financial progress monitoring is done on the basis of a comparison between quarterly budgets 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/S schemes headworks are categorized as being 25%, 50%, 75% or 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. The number of water connections and standposts out of the targeted total determines the stage of completion of that part of the scheme.

All water supply schemes are broken up in individual 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 (ED) scheme consisting of a borewell, 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 protected water supply scheme, with one source of water, water treatment and pipe distribution to one village there may be several components with a number of works each. Monitoring is then done at component and work level. In comprehensive protected water supply schemes with one source of water, 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 (possibly 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 PRED where it is merged 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.

Each public work has one or more M-books, 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 transactions 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 identifies each M-book includes Mandal name, village/ward, name of work and name of executing contractor or agency.

Information that is entered into the M-books relates to :

1. date of measurement
2. description of work (type of transaction)
3. measurements upto date with no., length, breadth, depth/height and contents
4. rate (RS/ps)
5. par (unit)
6. total value to date (Rs/ps)
7. deduct previous measurements, with page no. reference of M-book and quantity
8. since last measurement, with quantity and value
9. remarks
10. name of contractor

M-books 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 is 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 proformae reports. However, it appears that only a limited part of the M-book data are used for systematic monitoring purposes and for aggregation and forwarding.

Public works are awarded to private contractors after tender procedures. Each contractor has to be registered in a particular class of works before he can participate in tenders. There are 6 classes; a special class and classes I to V. Special and class I are further subdivided into 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. There appears to be no master register at state level.

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.

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.

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

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. Issues of these materials to the contractors are recorded in the M-book, as mentioned.

No standardized classification exists of materials used in RWS/S in AP and batch numbers (to uniquely identify/trace project materials for allocation to a particular work) are not assigned to purchase lots. Registers and M-books make use of non-standardized verbal descriptions of materials.

In addition to the registers mentioned above, a number of additional registers are kept. It would be beyond the scope of this report to go into details for each of them. A letter of August 18, 1980 (reference GOMs. No 486) lists 52 forms and registers in use in PRED divisions. Many of these are either purely financial or are not related to RWS/S works, and were not therefore included in the following list. (A * indicates that it was explicitly mentioned in the above paragraph)

Unstamped receipt book	Receipt for materials issued to contractors
* Register of works	
Contractor's ledger	Register of payments to contractor
Stock register of M-books	Materials register of M-books
* Register of agreements	
* Register of contractors	
Return showing receipts, issues and 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 PWS schemes	
Register of works check measured and supra-check measured	
Running account bill	

Some additional registers that are used but not mentioned in the August 1980 letter are

- Central stock register at EE level
- * Technical sanctions register
- Tender disposal register

2.4 The monitoring and reporting system of PRED

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 apparently never enters the monitoring data stream, while data summarizing and aggregation often is done either at the lowest level or at circle (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 Government of India, 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, to the Assembly and to individual politicians.

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 others* :

- 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 Missions; several schemes relating to guineaworm, brackishness, iron and fluoride content, and rain water harvesting structures
- NAP schemes, under NAP I and II (and possibly a sizeable 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 and under the State Sector Programme

At EE level monthly reporting is done manually on the basis of a large number of pre-printed forms (M1 - M10, SM1 - SM7, and A1 - A6). These forms carry data redundancies and appear to be subject to random revisions. Special additional reporting is required to satisfy the information needs of the District Development Officer, the GOI, UNICEF, the World Bank, the Royal Netherlands Embassy and several other interested parties.

Discussions with officials at EE and lower levels bear out that the volume of work associated with administrative overheads such as accounting and reporting has grown rapidly over the last decade or so. Few if any real modifications/improvements to the traditional methods of data collection, storage and processing were implemented and adequate support in terms of training and office equipment has not been forthcoming. Many DEE offices are very badly in need of basic office furniture and storage facilities.

The situation in PRED's Hyderabad head quarters in respect of its management information system is still less encouraging. PRED officials freely admit that the flow of information from the districts has over the past years grown so rapidly and to such magnitudes that top management has become less and less capable of meaningfully analyzing and interpreting the data. For this it has to rely on the districts ever more frequently. A salient consequence could be that PRED HQ is at risk of losing its capability of providing proper guidance to the giant organization in the short term and of not being able to effect proper and realistic planning with a longer time perspective.

2.5 The future of PRED

The challenges that PRED faces in the immediate future are daunting for a variety of reasons.

First PRED is likely to be up against even faster rates of growth than during the eighties. In view of the fact that Andhra Pradesh has begun to earmark 50% of all its development funds to rural development, the workload on PRED is certain to increase. In consequence of this PRED is shortly to embark on the recruitment of 1000 engineers who will swell the present ranks from roughly 3000 to 4000. Moreover, large sums of money will flow into AP from foreign sources, such as under the APCER project, and probably from NAP III and other RWS and non-RWS programmes.

Second, 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 rural development by GOI and GOAP. It is the view of the mission that this will call for more democratic attitudes, work methods and procedures, that in some measure are extraneous to PRED's traditionally techno-oriented culture and its rigid hierarchical relationships.

Third, up to this time and in contrast with other States, PRED has not been restructured or split up along functional lines. RWS projects for example require ever more specialized know-how and experience, yet staff can be freely drawn from and again be re-allocated to other sections within PRED, thus dissipating acquired skills or constraining their formation. The mounting responsibilities in terms of the construction and operation & maintenance of technologically more demanding schemes as well as

their numerical build-up would make the separation of RWS/S activities as a sector within PRED or from PRED into a new body all the more desirable.

Fourth, PRED's top management will be hard taxed to come to terms with the formidable growth rates in view of its ailing management information system. The recent decision to appoint an additional CE in charge of the information system and progress monitoring is highly opportune in this respect.

MIS development efforts and PRED

During the latter part of the 1980s several attempts were made to design, develop and implement management information systems (MIS) for PRED or for RWS monitoring purposes, or to otherwise introduce modern information processing technologies, in terms of software development efforts and computer training courses.

3.1 Software development

Three institutions have since 1987 attempted to develop computer software to establish some sort of a RWS progress monitoring system. These are respectively the Andhra Pradesh Technology Services (APTS), the National Industrial Development Cooperation (NIDC) and the National Informatics Centre (NIC). The efforts by the Institute of Public Enterprises (IPE) have been relatively minor and do not call for further discussion.

3.1.1 Andhra Pradesh Technology Services

APTS was established in 1987 as a semi-government organization, and was designated as the turnkey agency for the introduction of information technology in AP by GOAP. APTS serves as the sole consulting agency for all government departments in AP in respect of computer hardware procurement, systems studies and software development, systems implementation, end-user training, and secondment of specialized staff. In practice this means that APTS has been given a monopoly when departments request funds from GOAP for information technology purposes.

In 1987 APTS developed a 24 fields proforma (database) for the management of RWS/S infrastructural assets created by PRED. The information was obtained from an AP 100% sample survey. The database is still in use by the secretariat of GOAP, which has requested for an update of the information. PRED is supposed to supply the information to the secretariat, while APTS operates and maintains the system. PRED has no physical access to the system, and has lost interest in the system mainly because its functionality is severely limited and contributes little or nothing by way of assistance in planning for daily operation & maintenance work nor in longer term perspective planning.

In line with policy guidelines APTS has procured hardware for PRED and will continue to do so in the future.

In August 1990 GOAP and the World Bank commissioned APTS to develop a system for the execution of the Andhra Pradesh Cyclone Emergency Reconstruction Project (APCERP) including subsystems for accounting, according to GOAP controls and procedures, and physical project implementation monitoring. The execution of APCERP is partly in the hands of PRED, while the monitoring cell is in GOAP's secretariat under the Ministry of Finance and Planning and is manned by APTS personnel. PRED will not have access to the system on a daily basis for its own purposes, but will be required to supply information on a regular basis.

Other projects that APTS is involved in encompass a system for the operation and maintenance of large irrigation schemes under the Andhra Pradesh State Irrigation Development Cooperation (APSIDC), and the development of a land revenue database to be mapped on a Geographical Information System (GIS).

3.1.2 The National Industrial Development Corporation

In 1987 NIDC was instructed to develop an integrated monitoring system for rural water supply by the Department of Rural Development of the Ministry of Agriculture of GOI. In a situation analysis with respect to existing monitoring systems they arrived at the following conclusions [which today appear to be valid still].

- There is an absence of a well defined and documented system
- State monitoring cells [in the secretariats] are not properly structured, roles and responsibilities have not been defined, and there is a lack of awareness and apathy towards monitoring activities
- a plethora of formats are in use for monitoring, with inherent data redundancy leading to avoidable repetitions and overburdening of the field staff

The NIDC mission's aim was to design a cost-effective computerized monitoring system while maintaining compatibility in information storage and reporting procedures among District, State and centre.

NIDC set out to develop three modules, namely an integrated RWS monitoring system at State and District level, a materials management system, and a drilling rig monitoring system (a modified UNICEF version).

Experiences with these 1987 modules were not heartening. PRED is of the opinion that the programme is not versatile enough and does not allow dynamic querying, that it forces substantial data redundancies when more than one RWS programme is carried out in a village (village data have to be re-input for each scheme), that there is a mix up in one 39-field database of functionally dissimilar data on baseline info, monitoring and planning, and that many needs and problems were not addressed.

The materials management system was not implemented. Partly because NIDC provided no practical support (being a small organization then without representatives in the States), and because a number of pre-conditions were not met in AP, such as the establishment of a unique coding system for materials. [A review of the programme nevertheless learns that with adaptations it could provide the required functionality for AP].

The drilling rig monitoring system was implemented by the GOAP secretariat and is functioning, with PRED supplying the required information. PRED has rejected it for its own purposes since it does not come up to some basic expectations. Some types of drilling rigs for example are not monitored.

3.1.3 The National Informatics Centre

In 1986 NIC started a pilot scheme in 10 districts in India at the request of the Department of Rural Development. The department is responsible for the monitoring of the poverty alleviation schemes including IRDP, TRYSEM, DWCRA, NREP, RLEGP, RWS, DPAP & DDP. The project was named CRISP, or Computerized Rural Information Systems Project, with the strengthening of the monitoring of the centrally sponsored poverty alleviation schemes as its objective. It was meant to be implemented in all districts in mini computer centres on behalf of the Department of Rural Development Agencies and to be staffed by NIC. Telexes were installed as well as micro satellite data links (NICNET) with New Delhi. However, in the first phase only data formats for IRDP, NREP, RLEGP and RWS were included. This stage was designed to focus only on database establishment and computerized reporting. A second stage would assist in developing planning models at block and Panchayat levels, while a third stage aimed at the integration of all different phases and aspects for perspective planning at district level.

A field visit to Nalgonda (AP) learned that under the control of the District Collector and with competent personnel the NIC mini computer centre is operating and working on stage 1, the establishment of databases, and on the design of specific applications for use by among others the District Collector and District Development Officer.

The original plan included data collection on RWS, but because RWS projects are not implemented by DRDA, CRISP was not adopted by PRED. A brief review of the programme reveals that its functionality is again so limited that PRED is not likely to be tempted to introduce it in its own organization. Moreover, also NIC included the 39-field RWS-baseline database. This means that APTS (in an older and smaller 24-field version), NIDC and NIC have duplicated work. When asked about this NIC said that at system development time they were unaware of the work being done by NIDC in New Delhi.

APTS as the nodal agency for information technology in AP is aware of the activities of NIC in AP State and cooperates with it.

The overall conclusion that can be drawn from the past experiences is that the attempts to develop a RWS-MIS by third parties have fallen far short of PRED's expectations, and have produced disappointing results. The chief causes of these failures can be imputed to the observation that the developers never conducted proper system studies of the actual working conditions, work procedures, information needs and accountabilities of the various levels within PRED and that the systems were primarily designed to meet the information needs of other institutions. The systems invariably are incomplete and lack depth and are therefore largely irrelevant. The fact that none of the systems have been designed for operation by PRED itself, did little to kindle interest and greatly detracted from their usefulness. Information systems for an organization as large and complex as PRED need to be tailor-made in order to be truly useful for internal purposes and for being able to satisfy the information needs of external organizations as for example RNE.

3.2 Training courses on and information technology knowledge available with PRED

PRED has made some attempts to acquire computer technology knowledge. In 1987/88 three persons were sent to IPE for a 6-months course in computer applications. None of these persons however is still with PRED.

NAP Office in 1989 conducted a short computer awareness course for all SEs of PRED, and the EEs from NAP areas.

In September 1990 PRED together with the NAP office, organized a one month course for 15 Assistant Executive Engineers from CE, SE and EE offices dealing with NAP, plus some from other cells at CE level. The course was successfully conducted at PRED's new Centre for Development Research and Training (CFDRT). The subject was the use of standard software for database management, word processing and spreadsheet calculations. All trainees now have access to computer equipment at their places of work.

Only a (very) small number of people in PRED HQ have an above average knowledge in the field of information systems. They constitute the driving force behind the effort to introduce a computerized MIS in order to get to grips with the great need for an improved information system.

PRED has employed one graduate (AEE), who is presently following a computer programming course.

Extensive training at all levels will be required if a sustainable MIS is to be successfully implemented.

The information requirements of RNE

Annexure I of the terms of reference of the MIS consultancy includes an 18-page working document on the information requirements of RNE in connection with the bilateral RWS/S schemes. The TOR state that this document requires further conceptual and operational definition before it can be applied in the field. The document has the hallmarks of a 'check list', as apparently it is the result of reflections of what would be desirable information from a more theoretical point of view.

A number of observations can be made.

1. The document presents the indicators as being independent quantities. Monitoring indicators however always are dependent quantities derived from project objectives and with the aim of measuring the extent of achievement of these objectives. The document makes no attempt to formulate, and to quantify, project objectives and does not relate the indicators to these objectives.
2. The use of a systematic matrix approach for the project preparation and implementation stages serves as an invitation for the formulation of indicators for each cell in the matrix, resulting in a large number of indicators, which moreover may not always be relevant or measurable.
3. Any organization or group of organizations would in practice be hard pressed indeed to meet the exhaustive information requirements in terms of quantity, quality and coverage of the indicators. It is understandable that initial reactions to the proposal were not favourable. RNE 'overasks' the organizations.
4. A critical re-examination of the schedule and the drafting of minimum information requirements by RNE would be appropriate, bearing in mind the relevancy for RNE and the limited information generating capacities of implementing agencies.
5. The development of a limited set of simple but appropriate indicators is required for the different aspects of the integrated approach, with a clear demarcation of data collection/analysis tasks and responsibilities for the various agencies.
6. In many cases no indication is given as to what the source of information would be and who would be responsible for information collection, when and how. A strong role is assigned to coordinating offices like the NAP-office in AP, though often these will not be physically capable to collect or verify all the information.

7. A number of information items relate to mixed beneficiary groups or to dissimilar types of schemes. Although this is not stated explicitly, the document apparently assumes that the village would be the appropriate monitoring level. A village can not be considered as an unambiguous monitoring category because more than one water supply scheme may function in a village for which different agencies may be responsible, while a village may have a heterogeneous beneficiary population in socio-economic and ethnic terms.
8. Many items relate to qualitative statements that are difficult to define unambiguously and to verify objectively. Data on these items may be hard to compare in time and place and may lead to inconsistent time series. Examples are the 'attitude' and 'motivation' indicators for measuring physical progress of institutional development during the implementation stage of the project.
9. There is a mix up of one-time data pieces and items for which information needs to be collected on a regular basis, and that result in the building up of time series.
10. Some indicators may not be project-specific in the sense that they do not measure an aspect that the project specifically aims to improve. Instead they may appraise fringe conditions. Examples are the above-mentioned 'attitude' and 'motivation' indicators. Do attitudinal and motivational improvement constitute project objectives?
11. The proposed indicators are to be considered too in terms of their sensitivity. Do project conditions and their indicators change fast enough in response to project stimuli to be useful for monitoring purposes?
12. There are no proper indications whether beneficiary oriented data in particular are to be collected on a 100% or smaller sample basis.
13. The document makes no mention of the fact that the formal measurement of indicators by the financial/physical progress and beneficiary contact monitoring components of a monitoring system 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 unit needs to avail of backup capabilities to be able to detect and deal timely and adequately 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 favourable) circumstances and of deviations from planned targets need to be determined and options to counteract (or enforce) them have to be formulated.

An alternative and more realistic approach to the specification and imposition of information requirements by RNE would be to approach the problem from the MIS points of view of those who are to become information suppliers, as suggested in the TOR. Systems designed to address the inherent management information needs of the implementing RWS/S organizations themselves are more effective and more palatable propositions. With relatively little effort such systems can be elaborated to also suit the information needs of external organizations without over-encumbering the reporting staff. The next chapter comes with some practical proposals in this respect. 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 capability.

A proposal for the establishment of a MIS

An understanding was reached with PRED on options with regard to the possible establishment of a management information system within the context of the Netherlands Assisted Projects in Andhra Pradesh. Essential to the proposal is that the information system will in first instance be attuned to the internal needs of PRED, but proper attention will also be paid to endow the same system with the capacity to service the information needs of other funding organizations. It is not in the interest of PRED to be forced to design a separate system for each interested party.

No attention was given yet to the non-government organizations like CHAI. The information needs of the NGO's and semi-government organizations are more limited than PRED's. Their involvement could be taken up at a later stage, when systems to be specifically designed for them can be functionally integrated with PRED's, and when appropriate monitoring indicators have been formulated.

5.1 Scope of understanding and the system options

The understanding with PRED includes the following specifications (reference among others to letter by PRED to NAP adviser, LR NO: NAP/AEE2/MIS/90, dated Oct. 27, 1990:

1. In a pilot development scheme, two districts will be covered. Nalgonda and Prakasam were selected because they are representative for Andhra Pradesh as a whole. Upon satisfactory completion the system will be introduced in the whole of AP.
2. The design and implementation of a computerized MIS will be limited to RWS/S only.
3. All RWS/S schemes are to be covered, including new and existing schemes financed by GOAP, GOI, the World Bank, UNICEF, The Netherlands and other donor organizations.
4. The MIS project may form part of the proposals under the integrated approach by NAP-III.
5. The hardware requirements in the two-district pilot study and in all districts upon successful completion of the pilot studies could be part of the project.
6. Training of PRED personnel at all levels in all aspects of system operation and maintenance will be included.

7. The problem of vertical system integration is to be addressed. This means that the aggregation of data from the lowest implementation to the highest monitoring level as well as the required software support functions are to be dealt with.

8. A monitoring and evaluation unit will be established at CE level in PRED, that will in the end be capable of independently running and maintaining the computerized system.

The following areas of interest were identified where an improved monitoring system for the effective management of the RWS/S programme is needed. The office of the EE probably is the most suitable location for the installation of a computer system.

Each of these areas presents good points of contact for accommodating general and more particular monitoring indicators, including those specified by RNE.

A. Project management for physical, financial and quality progress monitoring of new constructions. The system is to be based on **M-book related data** for each work, at either the M-book level or immediately above it, and is to be so versatile and flexible that all required monitoring of new constructions can be based on it, both for internal and external reporting purposes, and that the information needs of all interested parties, including RNE, can be reasonably satisfied.

A tentative proposal specifies the establishment of a four-level accounting/monitoring hierarchy for each project, with one scheme level and subsequent levels for zones, components and works. The works level is to be the sole level for transaction recording. For smaller projects the zones and/or component levels may be dummy activities. The chief advantage would be the introduction of one transparent and uniform monitoring/reporting concept for all possible project sizes.

B. The establishment of a RWS inventory. This involves the creation the of a database of all RWS assets created. After the completion of a scheme, all its assets are added to the RWS master inventory by object type.

The prime objective of such an inventory is that it will serve as the basis for the Operation & Maintenance of the schemes' infrastructure, as well as providing the lowest level point of contact between the schemes and aspects of the integrated approach.

For *each water distribution point* (as one asset object type) for example the absolute and administrative location, a technical description, type, size and composition of the beneficiary population served, NGOs in charge of particular activities, and so on are recorded. The position of beneficiary populations and NGO efforts relative to the schemes' infrastructure is then known unambiguously. This provides a simple, direct and uniform interface between 'hardware' and 'software'. Because more than one water supply and sanitation scheme and various types of beneficiaries and NGOs may co-exist in a village, the current method of monitoring schemes and their usage on a village basis is not satisfactory.

The RWS inventory could in future be mapped onto a computerized Geographical Information System, enabling many types of spatial analyses and the production of a variety of maps on the location and coverage of populations, schemes and agency activities.

C. Planning for and execution of the Operation and preventive and corrective Maintenance of the assets created, including repair signalling, materials requisitioning, and financial settlement (and possibly revenue collection).

D. Support to the integrated approach. After completion of B and after formulation of suitable monitoring indicators, a system can be designed that facilitates the implementation of the integrated approach and that enables proper beneficiary contact monitoring. PRED, NAP office and the other collaborating organizations will be involved in this phase. All organizations are likely to require easy access to computer equipment.

E. Materials Management. To some extent materials management will have to be covered under Project Management and Operation & Maintenance above. Because 60 - 65% of all project costs relate to materials that are centrally procured by PRED, it is necessary to design a system that keeps track of the flow of project materials from godown to godown and finally to construction and maintenance sites.

All phases include full end-user training.

No attempt will be made to design a comprehensive Management Information System for PRED. Aspects that will not be dealt with under NAP-MIS are for instance the development of accounting and personnel management systems and of an improved drilling rig monitoring system. Work on these and other aspects will be left to the initiative of PRED.

Coordination and cooperation with APTS will be required, in view of its present involvement in the design of a project management system for the WB - APCER project with a notable RWS component.

5.2 The nomination of a systems development consultant

The question remains as to who could be charged with the responsibility to carry out the required system analysis studies, system design, implementation, field testing, training and after-care. A number of possibilities were examined. But it was only on the very last day of the mission that it became clear that by far the most competent organization in India today in respect of RWS MIS systems is the National Industrial Development Corporation in New Delhi. This is indeed the very same organization the work of which was reviewed in paragraph 3.1.2 of this report.

The reasons of why NIDC is recommended nevertheless are as follows :

1. NIDC has been and is still working on RWS management systems in many parts of India, and continues to accumulate specific RWS know-how. It is active in many industrial application fields as well.

2. NIDC is fully aware of the limitations of its early software systems, and has been upgrading them ever since. It now avails of many modules that have greater scope and depth. Some of the programmes are impressive indeed, although they still lack the depth that would be required by NAP and PRED.
3. NIDC is capable of and willing to develop tailor-made RWS MIS systems that fully conform to NAP user requirements. It actively applies the top-down and bottom-up approach to system development with system specific studies and field testing conducted at the work floor of the client organization.
4. The organization has grown from 10 to 35 highly qualified people.
5. NIDC recently completed the systems specifications for a RWS MIS for PHED Gujarat, one of the partner organizations of RNE !

Although experiences with early NIDC software were disappointing, NIDC is now in a much better position than it was some years ago. Its candidature should be seriously considered as the alternatives are less attractive. The alternatives are either to nominate APTS (has inadequate manpower and little RWS experience), to award the contract to a foreign consultant (needs acquaintance period, no local formation and retention of know-how, difficulties in providing after-care, may have no RWS experience, expensive), or NAP [or PRED] employs a competent local system developer (limited capacity, no long term institutional backup, no RWS experience).

A possible contention issue could be the observation that APTS holds a de facto monopoly on technology systems development in AP when GOAP funds are involved.

Although no GOAP funds will be involved, APTS might still be in a position to object to the nomination of a non-AP organization to work for an AP government institution in the field of technology services. In that case some sort of agreement with APTS may have to be entered into.

Whatever alternative is selected, it will be advisable to in addition nominate an external MIS consultant whose task will be to represent the interests of RNE, the NAP projects and its collaborating organizations, and who can communicate on a par with the system developers in technical matters dealing with such things as software architecture, database design, the user-interface, training of end-users and maintenance of system sustainability.

5.3 Work methodology and a provisional time schedule

Discussions have resulted in a tentative proposal to assemble, for all phases, a project team comprising of members from the Panchayati Raj Engineering Department, from NGOs and semi-government organizations (when relevant), NIDC, NAP office and a MIS-expert from India or the Netherlands to represent on a part-time basis the interests of NAP office and RNE. The team will study information and system requirements and

their design implications from the points of view of the top-down as well as the bottom-up approach and correlate and reconcile the findings to arrive at a final solution.

The exercise includes stages for systems analysis, development and implementation. Systems analysis consists of a study of information requirements and the formulation of a conceptual and then detailed design, the development stage includes hardware procurement and software development, while the implementation stage comprises hardware and software installation in the field, user training, software revision support and, if required, data processing assistance.

A provisional time schedule for the first stage estimates the systems analysis stage to require 4 months, the development stage 3 to 3.5 months, while the implementation phase is expected to last another 4 months. The entire cycle should not take more than approximately 12 months.

A second phase will focus on the extension of the PRED-oriented system to the other NAP districts, and on the integrated approach with special attention to the information and system requirements of each of the cooperating NGOs and semi-government organizations and to integration with PRED's system. The second stage is expected to be completed within 9 months.

A third and final phase includes an evaluation of the entire integrated system as well as the implementation of system enhancements and revisions as per requirements, and is estimated to require no more than 3 months. Phases 2 and 3 may partly overlap.

5.4 Work budget

The budget for the MIS project includes provisions for NIDC's and external consultancy fees, and hardware procurement for PRED in 8 NAP districts (12 EE, 4 SE, 1 CE), if these can not be procured from funds under the 'tools' component of NAP III, and for 6 collaborating agencies. Costs associated with end-user training for PRED will be borne by PRED itself, whereas those for other organizations will be provided for under the MIS project.

A provisional estimate of the total cost of MIS development comes to DFL. 1.2 million.

Terms of reference

1. **Scope of the Consultancy**

- a. RNE's working document on MIS needs conceptual and operational definition before application in the field. The first phase of the consultancy should work towards selection of a suitable set of indicators with a focus on physical progress. Functional integration of these and other indicators is aimed for at a later stage.
- b. The consultancy is to be addressed to the information needs, systems and their management in the NAP-AP, from the perspective of RNE's needs, as much as those of the concerned agencies themselves. The first phase of the consultancy is to be addressed mainly to NAP-office, PRED and CHAI (and NGO's to be involved in the future). At a later stage support is to be extended also to APDDCFL/IPM/MI.
- c. The consultancy should analyse and assess present reporting systems and make proposals for strengthening and upgrading them into an efficient MIS.
- d. Recommendations for procurement of computer infrastructure and organization/human resource development should take into account present and potential resources and capabilities (of RNE and of the local agencies themselves).

2. **Consultancy Tasks**

a. **Problem definition**

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

1. Water supply
2. Sanitation
3. Income generating activities
4. Community participation (through NGO's)
5. External water quality monitoring
6. Health/hygiene education
7. Involvement of women
8. Institutional development

- 9. Human resources development
- 10. Sustainability and spread of integrated approach to RWS/S

b. Knowledge acquisition

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

c. System analysis

1. Data capture :

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

2. Information Needs Assessment :

Inventorize the need for information at various levels of the participating agencies.

3. Organizations assessment :

Assess the organizational and operational constraints determining the willingness and ability of the various agencies to maintain and use the proposed MIS, or parts of it.

d. Initiated System Design

1. Database(s) design and development :

Conceptualize and define in practical terms (including software constraints, updating procedures, etc.) the databases to be maintained by the agencies at various levels.

2. Modular approach :

A step by step modular approach is to be taken while developing the MIS, to ensure correspondence to the *growing capacities and needs of the agencies*.

3. Prototype design :

Conceptualize, initially in a specific area, a Management Information System to collect, collate, analyse and interpret data, to serve as a guide to the system development phase.

e. Initiate Development of Software Programmes, keeping in mind

1. Adaptability to multiple users :

The software developed for each agency should be able to respond to the information demands from various monitoring bodies.

2. 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.

3. Data (input) handling facility :

The programmes should be capable of being updated/modified through simple data cards.

4. **User interface :**
The programme should be user-friendly.
5. **Flexibility :**
The programme should have questioning facilities for new information requirements and should be capable of further development through added on written programmes.

At a later stage

f. Refinement and Amplification :

In consultation with the agency concerned, first test the validity and practicability of the system, and then, in a second phase, amplify the system to cover all the other areas mentioned earlier.

g. System introduction

1. Installation and integration :

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

2. Identification of infrastructure requirements :

Make recommendations for infrastructure/manpower development for ensuring the use and maintenance of the MIS.

3. Training programme :

Plan and organize training programmes for personnel of the user agencies on all aspects of the developed MIS.

h. Mode of Consultancy Delivery :

The consultancy job is a turnkey job. 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 NAP-AP. This is bound to be a process for which deadlines at present are hard to predict.

3. Strategy

- a. The consultants should familiarize themselves with the information and management needs of the RNE, and with the scope of the Netherlands Assisted Programmes in India. This familiarization should include a discussion with RNE on resources that may be available for institutionalization of MIS in the NAPSU's and among the implementing agencies.
- b. 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 each agency operates.
- c. The consultants should begin from a survey of existing ground realities in the data collection, storing, reporting and retrieval systems of each of the agencies and develop a sustainable system beginning from there. They should be able to elicit and explicate information requirements which may not be well articulated by the persons who are actually responsible for the information.
 - d. Especially while providing support to PRED, the following need to be considered :
 1. Accountability/reporting responsibilities to several agencies :
GOAP/GOI/UNICEF/Panchayati Raj/NAP, etc.
 2. Database should be suitable for providing information to any or all of these agencies.
 3. This is apart from the regular monitoring/review requirements intra-departmental, at various levels of the hierarchy.
 4. A modular approach is to be adopted. The system is to be developed keeping in mind the needs of NAP divisions, circles and monitoring office at the HQ. This can be amplified later to serve the needs of every level and jurisdiction.

4. Time frame

To be indicated after the first mission.

5. Reporting

The consultant will hand in the report on the first mission within one month after concluding this mission. The report will contain a Plan of Operations for follow-up of the MIS-consultancy, with a budget and proposals for a time frame agreed upon during the mission with all parties concerned.

6. Liaison

The socio-economist of NAP office will interact with the consultants on a day to day basis and will orient/facilitate their work.

Annex 2

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Annex 3

List of persons met

Name	Function	Organization
Anjaneyulu, Mr. K.S.R.	Systems Manager	APTS - Hyderabad
Bhanja, Dr. S.K.	Director	CIBT - Hyderabad
Chandrasekhar, Mr. N.	Director	SPECK SYSTEMS PVT. LTD.
Chawla, Mr. B.S.	Senior Manager	NIDC - New Delhi
Ganapathy, Mr. K.	EE	PRED - Miriyalagoda
Gussenhoven, Mr. S.	Water Coordinator	RNE
Haranatha Babu, Mr. M.	Director	HARA ELECTRONICS PVT LTD.
Harmmeyer, Mrs. Dr. J.	Consultant Health	ETC
Janaradhana Rao Mr. P.	District Collector	Nalgonda
Katticareen, Mr. K.	Socio-Economist	NAPSU - Andhra Pradesh
Katticareen, Mrs. R.	Health Educationist	NAPSU - Andhra Pradesh
Kondal Rao, Mr. R.	CE (RWS & Admin)	PRED - Hyderabad
Krishna Gopal, Mr. C.	Head comp. centre	NIRD - Hyderabad
Krishniah, Mr. K.	Pr. Systems Engineer	NIC - Hyderabad
Kumar, Mr. A.	Group Manager	NIDC - New Delhi
Manchanda, Mr. V.	Chief Manager	NIDC - New Delhi
Mani, Dr. K.A.S.	Director	PROGRESS - Hyderabad
Nanda, Mr. P.	DEE (NAP-Cell)	PRED - Hyderabad
Naram, Mr. K.	Advisor	NAPSU - Andhra Pradesh
Parthasaradhi, Mr. P.	Director	SDL Ltd. - Hyderabad
Nayani, Mrs. M.	Programmer	SDL Ltd. - Hyderabad
Prabhu, Mr. V.	EE	PRED - Hyderabad
Ravinder, Mr. K.	Informatics Assistant	Nalgonda
Sankaralingan, Mr.	DDO	Nalgonda
Sathyanarayana, Mr. K.	EE	PRED - Nalgonda
Srinivas Rao, Mr.	AEE (NAP-Cell)	PRED - Hyderabad
Subramaniam, Mr. P	Director	CFDRT - Madras
Sureshkumar, Mr. N.	Informatics Officer	Nalgonda
Venkatachari, Mr. C.	Chief Planning Officer	Nalgonda
Venkateswarlu, Mr. C.T.	SE	PRED - Hyderabad
Venkateswarlu, Dr. K.	CE (Roads)	PRED - Hyderabad
Vishveshwar Reddy, Mr. B.	AEE	PRED - Hyderabad
Viswanathan, Mr. P.	EE	PRED - Bhongir
