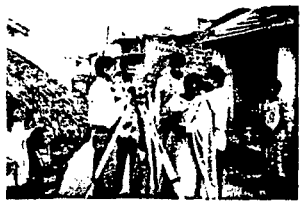
IN/026804 Received on 01/10/2001
AP- NAPP, 2001
Vizianagaram Approach

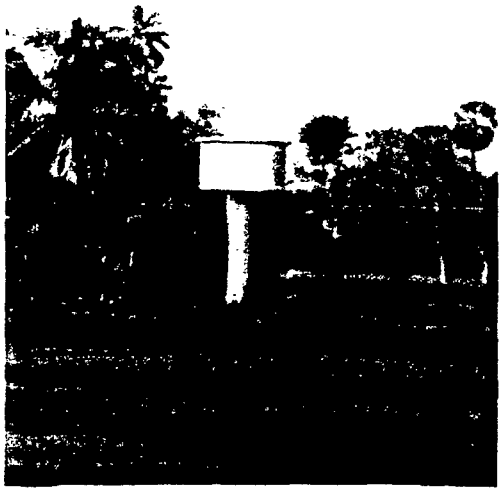


Development of the Approach

Community Managed Rural Water Supply & Sanitation Schemes

Netherlands Assisted AP III Projects, Vizianagaram

1998-2001



ETC International, The Netherlands
ETC Consultants India

LIBRARY IRC
PO Box 93190, 2509 AD THE HAG
Tel.: +31 70 30 689 80
Fax: +31 70 35 899 64
BARCODE: 17309
LO:

The opinions expressed in this document are that of ETC International and ETC India. This document is for official use only.

Approach to the AP III Project

Foreword

This report describes the experience in experimenting with the development of alternative approaches to Rural Water Supply & Sanitation (RWSS) under the Netherlands Assisted AP III Projects implemented in Andhra Pradesh, India in Nalgonda during June 1997 to July 1998 and thereafter in Vizianagaram till June 2001.

Additional information pertaining to the Project is available from the NAP AP III Nalgonda Project Document, evaluation and support mission reports, and project proposal documents for the Initiation and Expansion Phases in Vizianagaram, and lastly, in regular Progress Reports.

The assignment of the Panchayat Raj Engineering Department (PRED)/ Special Project Unit (SPU) and the Netherlands Assisted Project Office (NAPO) was to test the feasibility of alternatives to the standard approach in RWSS as evolved in the State over the past decades. This changed the role of NAPO and its staff from that of a monitoring and advisory institution to include the role of a change agent.

The Program was designed as a four-year experiment, where the Initiation Phase would conceptualise and field test new approaches in a limited number of habitations. The subsequent Expansion Phase would provide experience with implementation of the results of the Initiation Phase at larger scale in order to offer a well-tested alternative operational approach for consideration by the State Government, at the end of the project. Changes were later made in the original 4 year time frame separating the Initiation Phase from an Expansion Phase.

This document records the development process of the new approach and its components. It also records the experiences gained in attempting to field test, refine and implement the new approach.

Being an Initiation Phase and an experiment, the pilot project had obvious advantages and limitations. The advantages are related to the smallness of the scale of operations, permitting a focus on quality of the approach and simplifications that could not automatically be applied to a large scale program.

The limitations stemmed from the project's relatively small size and the correspondingly low level of influence and attention that it drew from the concerned Government department, resulting in inadequate allocation of leadership capacity at field implementation level. It also implied that innovations had to be brought into the project without the full commitment of resources from the implementing agency that would have been normally available to a physically and financially larger project.

This was further complicated by an abrupt change in location of the project from Nalgonda (during 1997-98) to Vizianagaram (during 1998-2001). Fund-flow problems, and a number of developments in the Netherlands' policy to Development

Cooperation, have also limited the smooth development and long term scope of new approaches and the development of a necessary strategic perspective.

Despite these drawbacks the project has succeeded in conceptualising and field testing new approaches to RWSS establishing their feasibility. It has proved that there is ample potential in involving the rural communities to take responsibility for their needs and provisions in RWSS and to work with the appropriate Government department to create the necessary receptiveness to alternative approaches.

In comparison with other approaches some major improvements can be observed:

- After completion of the facilities in the experimental project location, the facilities deliver sufficient drinking water on a daily basis.
- There is a great improvement in the knowledge and understanding among the user community regarding the design, construction and operation of the facilities.
- The facilities are operated and managed by the communities
- The inclusion of waste water disposal, renovation and rehabilitation of existing sources, hygiene promotion programs and community organisation to improve solid waste management have all contributed to a significant improvement in the larger sanitation picture in project habitations.
- The project established systematic improvements in accountability, planning implementation and reporting.

The Initiation Phase adopted a process approach, stimulating the community and the implementing agency through continuous dialogue and social mobilisation techniques, to participate in a realistic assessment of needs, wants and wishes, flexibility in design and a greater role to be played by the community in the creation and operation of the drinking water facilities at habitation level.

The chapters in this report will take the reader through the context or backdrop against which the approach was developed and the main experiences in the social and technical activities in this pilot project.

The approach to the Project has evolved over a period of time with a gradual evolution of sequences, integration of activities and identification of milestones at crucial stages of the project. This has resulted in an appreciation of the complexities of the project's approach and has conceptually culminated in the formation of the "Sequence of Activities".

Additional sections to this report provide information on the experience with communities and some of the institutional considerations for such a pilot project.

As described in the section "Context", some important changes have taken place in the State's policies on the Drinking Water Sector towards the later stages of the Initiation Phase. These changes have now resulted in a Sector Reform Program in five Districts, which includes many characteristics that are similar to the concepts that were developed and field-tested in Vizianagaram.

On behalf of SPU-PRED and ETC, I take this opportunity to record our gratitude to the Principal Secretary Rural Development and the District Collector Vizianagaram, the Panchayat Raj Engineering Department, the Royal Netherlands Embassy and other institutions who have contributed to this Initiation Phase in Vizianagaram, for their support to this experiment.

The ETC Group is of the opinion that the Initiation Phase has contributed to the reformulation of the RWS sector policy in the State. On behalf of the ETC Group, I would like to express our appreciation and gratitude to the staff of the SPU-PRED and the staff of ETC at NAP Office, who have shown courage and creativity in making the experiment successful in an environment and setting that was not always easy.

F. Hanrath
Team Leader NAPO

August 2001

Table of Contents

List of Abbreviations

Executive Summary 1
Observations & Lessons Learned 8
In Conclusion 10

1. The Context 13
1.1 Institutional Aspects 13
1.2 On the Netherlands' side 14
1.3 Technical Aspects 14
1.4 Community Participation 15
1.5 The Community 16

2. Introduction to AP III 17
2.1 The AP III Program 18
2.2 AP III - Pilot Project in Nalgonda 19
2.3 AP III Project - Initiation Phase in Vizianagaram 20

3. Development of the Approach 23
3.1 Introduction 23
3.2 Systematic Planning 23
3.2.1 Methodology for selection of Work Area and Habitations 23
3.2.2 Methodology for planning of village project cycle 25
3.2.3 Sequence of Activities 27
3.2.4 Methodology for reporting and monitoring 28
3.3 Community Participation 28
3.4 Utilisation of groundwater as a source 29
3.5 Flexible Design, Cost-Effective Construction, and Sanitation Plan 29
3.6 Community Responsibilities towards O&M 30

4. Sequence of Activities and its Components 31
4.1 Preliminary Investigations 31
4.1.1 Social & Demographic Profiles 32
4.1.2 Assessment of Participatory Potential 32
4.1.3 Inventory of Water Resources 32
4.1.4 Water Quality Assessment 33
4.2 Socio-Technical Surveys 35
4.2.1 Habitation Social Mapping - PRA 36
4.2.2 Household Survey and Water Needs Assessment 37
4.2.3 Habitation Technical Mapping 37
4.2.4 Assessment of Existing Water Sources 38
4.2.5 Hydrogeological Investigations 39
4.3 Community Organisation 40
4.3.1 Household, Street & Habitation Meetings 40
4.3.2 Formation of the MANISA 41

4.4 Source Creation 45
4.4.1 Evaluation of Source Yields 45
4.4.2 Source Creation 46
4.5 Design Process 49
4.5.1 Formulation of Design Criteria 49
4.5.2 Delineation of Service Areas 52
4.5.3 Draft Scheme Formulation 54
4.5.4 Rehabilitation Plan 55
4.5.5 Sanitation Plan 55
4.5.6 Operations & Maintenance Plan 56
4.5.7 Capacity Building 57
4.6 Approval Process 58
4.6.1 Consensus on Scheme Design 59
4.6.2 Tripartite Agreement on Habitation Plan 60
4.6.3 Marginal Appraisal - Approval of RNE 60
4.6.4 Tendering 60
4.7 Implementation of the Habitation Plan 61
4.7.1 Scheme Construction 61
4.7.2 MANISA Activities 65
4.8 Scheme Handover 68
4.8.1 Handover Documentation 68
4.8.2 Delineation of O&M Responsibilities 70
4.8.3 Operational Monitoring Systems & Maintenance Procedures 70
4.9 Scheme Operation & Management 72

5. Project Management Process 75
5.1 Institutional Framework 75
5.1.1 Special Project Unit at Headquarters 76
5.1.2 Special Project Unit – Vizianagaram 76
5.2 Institutional Lessons 78
5.3 Role of NAPO Technical Assistance 80
5.4 Institutional Accomplishments 81

6. The Social Processes: Community Organisation 83

7. Capacity Building Initiatives 89

Annexures:

Annexure 1: Introductory Visit to Vizianagaram
Annexure 2: Format for Preliminary Investigation Data
Annexure 3: Format for Water Needs Analysis
Annexure 4: Guidelines for Village Technical Survey
Annexure 5: Water Quality Data
Annexure 6: The Water Management Committee - MANISA
Annexure 7: Proceedings of Habitation Planning Workshop held on 21-22 January 99, Vizianagaram
Annexure 8: Water Demand Assessment in Jami Mandal
Annexure 9: Sanitation Plan Format
Annexure 10: O & M Collection and Monitoring Forms
Annexure 11: Tripartite Agreement
Annexure 12: Progress Report
Annexure 13: Completion Report
Annexure 14: Capacity Building
Annexure 15: O & M Responsibilities
Annexure 16: Guidelines for Calibration of PWS Schemes

List of Abbreviations

AP	Andhra Pradesh
AP I, AP II, AP III	First, Second and Third generation of Netherlands Assisted Projects in AP
APSEB	Andhra Pradesh State Electricity Board
APSRAC	Andhra Pradesh State Remote Sensing Applications Centre
ARWSP	Accelerated Rural Water Supply Program
CE	Chief Engineer
CGWB	Central Ground Water Board
CO	Community Organiser
CPHEEO	Central Public Health and Environmental Engineering Organisation
DFL	Dutch Florins, Dutch Guilders
DM&HO	District Medical & Health Officer
DPEP	District Poverty Eradication Program
Dy. EE	Deputy Executive Engineer
DWSS	Drinking Water Supply & Sanitation
EE	Executive Engineer
ENC	Engineer-in-Chief, Panchayat Raj Engineering Department
FA	Financial Assistance
GIS	Geographical Information System
GLSR	Ground Level Service Reservoirs
GO	Government Order
GoAP	Government of Andhra Pradesh
GOI	Government of India
GP	Gram Panchayat
HH	Household
HIS	Hydrogeological Information System
HO	Head Office
HP	Hand pump
IRS	Indian Remote Sensing Satellite
LWSS	Local Water Supply and Sanitation
JEE	Junior Executive Engineer
LPCD	Litres per capita per day
MANISA	Manchi Neeti Sangam (Drinking Water Users Association)
MDO	Mandal Development Officer
MLSR	Medium Level Service Reservoir
MRO	Mandal Revenue Officer
NAP	Netherlands Assisted Projects
NGO	Non Governmental Organisations
NRSA	National Remote Sensing Agency
O&M	Operation and Maintenance
OHSR	Overhead Service Reservoirs
PRA	Participatory Rural Appraisal
PRED	Panchayat Raj Engineering Department
PRFS	Project Reformulation Feasibility Study
PTU	Pump Test Unit

PSP	Public Stand Post
PWS	Piped Water Supply
RGNDWM	Rajiv Gandhi National Drinking Water Mission
RNE	Royal Netherlands Embassy
RWS	Rural Water Supply
RWSS	Rural Water Supply and Sanitation
SE	Superintending Engineer
SPA	Special Project Assistant
SPO	Social Project Officer
SPU	Special Project Unit
SPWD	Society for Promotion of Wastelands Development
TA	Technical Assistance
WMC	Water Management Committee
WNA	Water Needs Assessment

Executive Summary

This document describes the process of evolution of the implementation approach to the Initiation Phase of Netherlands Assisted AP III Project in Rural Water Supply & Sanitation in Vizianagaram, Andhra Pradesh.

Conclusions that could possibly be drawn from the experience in the Initiation Phase will be presented in the physical and financial completion reports, which shall be prepared separately. This report is not an assessment or evaluation of the Initiation Phase of the AP III Project.

The document contains the following chapters:

1. The Context
2. Introduction to AP III
3. Development of the Approach
4. Sequence of Activities & their Components
5. Institutional Management of the Project
6. The Social Processes
7. Capacity Building

Each of the above sections and their corresponding sub-sections are described briefly, later in this Executive Summary. The Executive Summary also has a section entitled Observations & Lessons Learnt.

Chapter 1: The Context

This chapter describes the general background or setting of the RWSS sector in which this pilot project was conducted, in terms of institutional and technical aspects and from the point of view of participation of communities in the project area.

Chapter 2: Introduction to AP III

This chapter describes how this Pilot Project came about as a logical consequence of earlier generations of support from the Netherlands Government in the NAP AP I and AP II projects. The AP III Pilot Project was conceptualized from observations, analyses and lessons learned from these earlier projects.

Section 2.1 describes how many of these earlier observations and lessons learned, as well as how alternative concepts, coincided with national level policy positions on the RWSS sector, as expressed in the successive Five Year Plans, and documents and guidelines from the Rajiv Gandhi National Drinking Water Mission.

The over all concept of the NAP AP III programme was to develop new approaches to RWSS, that would promote community ownership and management, and field test such approaches on the ground in order to achieve the main objective of the AP III programme , to enhance RWSS policy at State level.

Sections 2.2 & 2.3 describe the commencement of a project's Pilot Phase in Nalgonda District, where an earlier investigation (the Project Reformulation Feasibility Study of 1994) indicated that the problem of groundwater water quality (high fluoride content) in Nalgonda could be addressed with improved hydrogeological inputs for locating low fluoride content sources.

While the Pilot Phase of AP III was in progress in Nalgonda, the project implementing agency, Panchayat Raj Engineering Department and the Royal Netherlands agreed that attempts to address the water quality problems of Nalgonda jeopardised the main objective of the AP III project: *development of new approaches to RWSS, that would promote community ownership and management.*

In view of this shift in focus, it was agreed in July 1998 that efforts to develop and test the alternative approaches would stand a better chance in Vizianagaram District, which was expected to be more receptive to change and would present lesser degree of problems in terms of water quality and political expectations.

Chapter 3: Development of the Approach

This chapter deals with the approach developed in AP III in Vizianagaram to ensure the creation of RWSS facilities that would promote community ownership and management.

Section 3.1 contains the introduction to the approach. Its lists the key features of the approach, and provides an introductory description of the key features.

Section 3.2 Systematic Planning describes the levels of planning; selection of the work area, identifying and planning steps and required activities in the project cycle in each habitation, grouping these into stages or blocks of activities, dovetailing the activities of the various components (hydrogeology, social and technical) and determining the logical planning sequence and milestones.

This resulted in formulation of an initial conceptual model (**Section 3.2.2**) and an overall Sequence of Activities (**Section 3.2.3**) to be followed in each habitation. Flow charts have been used to represent these processes. The methodology for monitoring progress of the project has also been discussed here.

3.3 Community Participation reiterates the importance of community participation and the implication of the strategic choice to use groundwater and spot sources to enhance local level community organisation and involvement in O&M. Reference is also made to Section 4.3 and Section 6 which also comment further on the processes of community organization and participation.

Section 3.4 introduces the **choice for groundwater** utilization from technical and social point of view.

Section 3.5 discusses the aspect of **flexibility in design**, deviating from standard or "type" designs, field investigations to gather details of location specific needs to allow cost-effective and appropriate design and construction of the water supply system and the larger habitation plan.

Section 3.6 introduces **community responsibility for O&M**. Responsibility for operation of the facility and payment for O&M would justify the community's participation and claim to ownership of the facilities.

Chapter 4: Sequence of Activities & their Components

This chapter deals with the Sequence of Activities (refer Section 3.2.3) in each habitation, in detail. Its sub-sections then go on to deal with each activity of the Sequence and their respective sub-components.

In order to maintain continuity, each sub-section of Chapter 4 returns to the original graphic presentation of the "cascade" flow chart of the Sequence of Activities, highlighting the particular activity being discussed in detail and shows a "pull down window" that lists the sub-activities at that level of the cascade. Detailed descriptions of sub-activities then follow and are summarised below.

Section 4.1 Preliminary Investigations for each habitation describes its components; of compilation of a socio-demographic profile; the assessment of the participatory potential and its process, where the willingness to accept the approach to community owned and operated RWS facilities was a precondition for taking up any further activities in the particular habitation; the compilation of an inventory of existing drinking water sources existing prior to any project intervention, through a process of habitation mapping, assessment of condition of existing sources and drawing of water samples for water quality assessment.

Section 4.2 Socio-Technical Surveys- Conditional to positive outcomes on the question of a community's willingness to participate and take responsibility for O&M, the next set of activities, comprising of socio-technical surveys, would be undertaken. The sub-activities would be:

Section 4.2.1 describes the process of **Social Mapping** of the habitation with PRA.

Section 4.2.2 describes the procedure for a **household survey** and a water needs assessment for a habitation, based on the present water consumption.

Section 4.2.3 describes the process followed in the **technical survey** and habitation mapping to provide a basis for the technical design.

Section 4.2.4 describes the testing of **water quality** of all existing public water supply sources in the habitations. The question of testing capability and the decision to create a local laboratory is also discussed.

Section 4.2.5 describes the methodology for **hydrogeological investigations** using satellite imagery, creation of village base maps for analyses of local geological structures and hydrogeomorphological conditions to identify potential areas for detailed site investigations.

Section 4.3 Community Organization- The activities under community organisation are described here under the overall sequence of activities. However, community organisation was also a continuous activity throughout the entire project process. This aspect of the commonality of community organisation in the entire project approach has been further elaborated in Section 6.

The description moves from the lowest level, the household, to the street level, (where the public stand posts would be), to the Gram Sabha (village meeting) at habitation level, to the formation of habitation level water management committee (the MANISA) and lastly, initiation of the process of formation of an apex body of MANISAs in one Mandal.

Section 4.3.1 describes the process of **community organisation** at the household and street levels.

Section 4.3.2 deals with the **formation of the water management committee**, the **MANISA**, and the process followed, as well as the selection of members, office bearers and the process in the smaller habitations with hand pump facilities. The legal status of the MANISA, their roles and responsibilities and the reorganization of the MANISAs after two years of functioning are also discussed. Lastly, the partial completion of the process of formation of an apex body is discussed, federating MANISAs from different habitations into a joint forum in their dealings with other institutions in Jami Mandal.

Section 4.4 deals with the subject of **Source Creation**.

Section 4.4.1 describes how all sources that satisfied the earlier **water quality tests**, were tested and assessed for sustainability on the basis of yield. A computer programme was developed for data processing of yield data and training was provided to the PRED.

Section 4.4.2 - where existing sources were assessed as unsatisfactory in both quality and yield, new sources were created and their sustainability further confirmed with quality and yield tests.

Section 4.5 Design Process

Section 4.5.1 describes the process of **formulation of design criteria**, adopting flexibility in design as opposed to adoption of standard and type designs for this project. The main issues include: taking the population baseline from the household survey conducted in the socio-technical survey (as against adoption of secondary data from the Census or other sources); assuming power availability for 10 hours per day (as opposed to the standard assumption of 16 hours per day); improving service level by reducing the population dependent on a PSP from 250 persons to 150-180 persons

per outlet; experimenting with decentralised storage for a neighbourhood within a habitation by designating it as a "service area" ; realistically computing source capacity (yield) by using findings of the household survey for water needs assessment; introducing community participation in the design and approval processes; and preparing the communities to take over responsibility of Operation & Management of their schemes.

Section 4.5.2 describes the process of **delineation of service areas**. Based on the observation that a "community" is not a homogenous group within a habitation and is composed of conglomeration of geographical pockets of different caste groups and social strata, the technical design opted to organise storage and service areas taking this social reality into consideration. This procedure led to the decentralisation of water supply, greatly facilitating the process of reaching consensus on contentious issues, ensured greater autonomy over access to water and thus furthered community organisation and community responsibility for the facilities.

Sections 4.5.3 – 4.5.6 describe the processes of the **formulation of draft designs**, a rehabilitation plan for existing facilities , a sanitation plan and a plan for operation and maintenance.

Section 4.6 Approval Process

This describes the process of arriving at a consensus between the PRED-SPU and NAP Office on technical design for each scheme and the participation of the community in this process (**Section 4.6.1**).

Section 4.6.2 describes the process of presenting a draft design to the MANISAs, responding to their queries and incorporating their preferences and suggestions for changes. The MANISAs would then explain the draft design to their Gram Sabha, with assistance of the SPU, to signify formal acceptance of the user community.

This process was concluded with signing of a **tripartite agreement** between the community (represented by the MANISA), the PRED-SPU and NAP Office on the **Habitation Plan**, which contained details of the Water Supply Scheme, the preliminary Sanitation Plan and the O&M Plan.

After reaching this level of agreement, the **Habitation Plan**, would be compiled for each habitation into a **Marginal Appraisal** document for formal acceptance of the RNE (**Section 4.6.3**) after which the water supply scheme would be tendered by the SPU-PRED (**Section 4.6.4**).

Section 4.7 Implementation of Habitation Plan - The main activities in implementation of the Habitation Plan included construction of the water supply scheme facilities and monitoring of its progress on the one side and the strengthening the MANISA, through training and capacity building on the other.

Section 4.7.1 - The scheme construction was executed by contractors supervised by the SPU. Contrary to earlier indications from the highest levels of PRED, involvement

of communities in construction and its monitoring were not operationalised. As a result, schemes were constructed under the usual contracting norms of PRED.

As RNE had assigned the technical assistance component of the project with the responsibility of administering the financial assistance component of the project funding, a system was developed for funding the SPU for construction of schemes and other project activities. This was based on a providing SPU with a reimbursable advance, replenished against regular monthly reporting of physical and financial progress .

With respect to construction of schemes, NAP Office's role focused on monitoring of physical and financial progress, for which appropriate reporting formats were developed and agreed upon.

This section also briefly describes other stages of scheme construction such as completion, stabilising and commissioning, which are also discussed in Section 4.8 Handover.

Section 4.7.2 MANISA Activities - During the construction of the schemes, MANISAs were further strengthened through training and capacity building to undertake specific activities such as implementation of the sanitation plan, hygiene promotion, identification of scheme operators, establishment of the O&M fund, etc.

Section 4.8 Scheme Handover- Scheme handover options were influenced by separating of the Initiation Phase from the longer term programme. Originally a longer stabilisation period and gradual handover were planned, during the startup period of the Expansion Phase. Separating the Initiation Phase and terminating it in June 2001 necessitated contingency planning by bringing the handover process forward much earlier than originally planned. This did not allow the time necessary for a systematic post-construction scheme stabilisation phase and for a thorough preparation for MANISAs to take over day-to-day O&M of schemes.

Section 4.8.1 describes how the handover was accomplished by providing each habitation elaborate information and documentation on the scheme and facilities created and guidelines how to operate these facilities (the **Handover Documents** have been provided along with this report). Delineation of **responsibilities for O&M** are discussed in **Section 4.8.2** and establishing benchmarks for schemes performance by calibration procedures, in the absence of **technical completion certificates**, are discussed in **Section 4.8.3**.

Section 4.9 Scheme Operation and Management

As indicated earlier, a gradual handover of completed schemes was not possible and handover occurred before the closure of this phase. Hence the Pilot Phase has limited experience with O&M by MANISAs.

After handover, MANISAs are expected to manage their water supply schemes and are free to engage assistance from any service provider they deem fit.

Much will depend on the local scheme operator and the control that MANISAs exercise over their operators. For major maintenance, the PRED is expected to render assistance.

Under normal circumstances, PRED would hold a contractor responsible for rectification of major defects for the period of one year after completion of construction of a scheme, by with holding a part of the payment due to the contractor. With the handover completed, the PRED is in a position to complete their contractual arrangement with contractors, including release of this payment. This has been one of the problems of the short period for stabilisation after construction. As no completion certificates were made available, there seems to be no financial guarantee for such eventualities.

Chapter 5: Institutional Management of the Project

Section 5.1 describes the **institutional framework**, and proposed responsibilities as specified in the project document for the Initiation Phase in Vizianagaram.

A Special Project Unit in PRED Head Office to direct and supervise the pilot project.
A Special Projects Unit at District level for field level implementation of the project.

This Chapter describes how some components of the structure did not materialize and hence the targeted roles and responsibilities were not met, resulting in shortfalls in direction and leadership for the project. It also resulted in changes of the role of technical assistance, which had to become much more operational than anticipated in a number of respects.

The section further describes the need for water quality testing facilities, resulting in the creation of a laboratory, where the PRED was unable to meets its commitment of providing full time staffing resulting in a significant under-utilization of the facility.

Section 5.2 describes the role of the **Technical Assistance** and some of the changes in this role to fill in gaps that emerged.

Section 5.3 describes some **observations and lessons** regarding institutional management, availability of inputs, hydrogeology and water quality testing facilities.

Section 5.4 describes some **institutional accomplishments** in the course of the implementation of the pilot project.

Chapter 6: The Social Processes

This chapter provides an insight as to how social mobilisation processes were necessary at each level of the Sequence of Activities by using the same cascade flow chart and indicates how this was a common thread running through most of the project activities. It illustrates the pivotal role that community organisation had in the entire project's approach in empowering communities to take over management of their drinking water supply systems.

Chapter 7: Capacity Building

This chapter provides a detailed compilation of the capacity building activities, training programmes and workshops convened as a part of the technical assistance programme, to enable various stakeholders at different levels of the project to work towards achievement of the project's objectives.

Observations & Lessons Learned

As stated earlier, this report deals with the project implementation process developed in the Pilot Project. Hence the presentation of conclusions and lessons learned in this document is limited.

1. Policy & Project Implementation

A pilot project assigned to develop and field test new approaches would benefit from the full cooperation and support of both the policy formulation level of the Government and its designated implementation agency. Without an appropriate institutional structure to direct the experimentation at the field level and incorporate the results into the implementation mainstream, the outcomes of such a pilot project would stand to be underutilised.

Hence, it is necessary, that both the policy and implementation levels of the Government, in this case, the State's Department of Rural Development and the PRED, respectively be involved in the evolution of the project. In the case of the AP III Projects, a clear distinction was not made between the policy formulation function of the Government and the project implementing agency.

It was assumed that the PRED would perform both the policy formulation and project implementation functions. Initially the project was placed under the structure of "special projects", for establishing a direct institutional link between the field activities and PRED head quarters at Hyderabad. However, larger organisational systems took over (such as restrictions to engage external professionals) and diluted the original intentions.

Quite understandably, an implementing agency is more focused on the physical delivery of the service that is its mandate, the success of which is measured by quantitative parameters such as coverage, financial turnover and achievement of physical targets. However, such yardsticks are not valid in an experimental approach to a project.

2. Planning, Management, Documentation and Reporting

At the field level the pilot project has been reasonably successful in introducing implementation in a planned manner. The Sequence of Activities was evolved with inputs from the SPU and the community, by ensuring transparency in the implementation process and by careful monitoring of the progress of each project components and activities in its appropriate sequence. This implied that a given

activity could not be undertaken before its "predecessor" activity was completed. This prevented situations, observed elsewhere, where design and construction of physical infrastructure of schemes are underway or even completed, without creation of a water source.

Problems were experienced in the planning of some issues, in particular the availability of appropriate drilling equipment and in obtaining electrical power connections. A lesson that could be learned is that the time frame for construction could be reduced if these issues can be better planned and managed.

Human Resource Management at the field level was planned by PRED Hyderabad by appointing an Executive Engineer with two Sub-Divisions (two Dy. Exec. Engineers and eight Asst. Exec. Engineers) for the construction component of the project, based on the expectation that the project would move from the Pilot Phase to the Expansion Phase within one year. This was done since, under staffing restrictions of the Government, expansion of the staff contingent would be difficult at a later stage and that full group of the SPU staff would be oriented to the project's approach during the Initiation Phase. Later decisions to limit and separate the Pilot Phase from the Expansion Phase and to conclude the Pilot Phase did not allow this to happen.

The Pilot Phase was successful in introducing improvements in reporting on physical and financial reporting. Clear formats for monthly reporting were discussed, agreed upon and applied. In finance, the approved budget per habitation formed the basis of financial progress. An advance of Rs. 10 lakh was put at the disposal of the SPU and reimbursements were on a monthly basis after receipt physical and financial progress reports.

It is difficult to predict time frames for different components of the project sequence because of external problems and interruptions that sometimes brought the project to a standstill. However, contrary to past experience, the planning and monitoring processes of the Pilot Project has resulted in no overruns in time and finance. In fact the Pilot Project was able to introduce an external financial audit of the project accounts immediately after its closure.

3. Community Participation

The introduction community involvement has been successful in the project's trajectory up to stage of approval of the Habitation Plan and in the Handover – Takeover process to transfer the responsibility of O&M to user communities.

Community participation focused on setting up of MANISAs, their functioning, approval of scheme designs and costs, creation of O&M Funds through fund raising from individual households, selection of scheme Operators, implementation of Sanitation Plans and taking over of schemes. However, community participation could not be operationalised in physical construction of water supply facilities, either by direct or indirect access to work components or in monitoring of the work of external contractors.

In future, such participation should be facilitated, as proposed the forthcoming Sector Reforms programme. The conclusion may be that community participation and responsibility for cost sharing is very well possible and in fact offers great potential for improvements in creating appropriate water supply facilities with ownership and operation by communities.

4. Process Approach

Throughout the Pilot Project, the need for a process approach has been apparent. In an experiment there is little use for blue prints and prescribed operations. As the concepts are new for all the stakeholders, these need to be discussed and reviewed constantly and with transparency. The willingness to be transparent will in turn increase trust and confidence among the stakeholders, ensuring that their participation is genuine and taken seriously.

For each specific habitation the process will bring the issues and problems of the community to the surface and solutions and details of methodologies will emerge in the process of interaction among stakeholders.

5. Ownership

A lesson that could be learned is that genuine participation and "household based" financial contributions do create a claim and ownership of the RWS facilities and the understanding that drinking water is costly and scarce.

The guidelines might specify how the community's contribution is to be generated in the future, as external donations or the use of subsidies from other sources, to fulfill the obligation of community contribution, may not create the same sense of ownership and responsibility among the inhabitants.

In Conclusion

The Pilot Project has measured success in comparison to previous experiences (e.g. NAP AP II and the regular RWSS programme) and in comparison with the objectives and targets laid down in the approved project document and later amendments.

The objective to develop and field test alternative approaches towards community owned and operated drinking water and sanitation facilities has been successfully completed. The original targets for the Initiation Phase were completion of water supply facilities in a number of the habitations with these alternative approaches and to have a number of habitations in various stages of development of the project. These targets were reached in December 1999, within one year after the project funding started in Vizianagaram.

When the Initiation Phase and the Expansion Phase were separated, the targets for the Initiation Phase had to be reformulated into completion of project activities in all habitations belonging to the Initiation Phase along these lines and to bring this project phase to a conclusion. These targets were reached in June 2001.

The primary output of the project consists of 24 habitations with community owned and operated drinking water and sanitation systems.

Contrary to observations in earlier projects, where water supply was limited to one hour in the morning and one in the evening per day and with long period of days with no water supply, the habitations taken up under the Pilot Project have a sustainable supply of drinking water. There is no insecurity of whether there will be water in the evening or the next day; there is no need for waiting for water to come as the decentralized storage ensures water all day. The systems are simple and appropriate, making local operation manageable and are combined with a drainage system that connects the newly created as well as the already existing sources. There is a significant increase in the detailed knowledge among the users about where the water is coming from and how the system operates, as well as what it takes to maintain the system for the future.

In fact there is more water than presently needed, which is logical as the systems were built for a larger future population. Hence the systems have been calibrated in cooperation with the users.

The operation of the systems is financially independent and covered by community contributions.

The pilot has not been successful in activating community participation in the tendering procedure and the construction of facilities, since this was not envisaged in this stage. The Pilot has not been successful in its influencing policy at the level of the implementing agency and beyond Vizianagaram District. However, there is some compensation in the fact that the Sector Reform programme now provides the policy framework for a number of issues that remained unresolved in the Pilot Phase. The experiences from the Pilot Phase are finding a degree of appreciation from the Department of Rural Development, APARD, WSP, and other bodies attempting to put the Sector Reform process on a sound footing. This project has already put many of the proposals of the Sector Reform Guidelines to test.

1. The Context

A brief description of the context is necessary to explain the background of the rationale for the pilot and some of the problems expected and encountered.

1.1 Institutional Aspects

During the past decades the implementing agencies have operated under centrally guided policies, with a structure of thematic and regional organisation for implementation. Probably because of the sheer magnitude of their responsibilities, they have implemented their tasks within the boundaries of their particular responsibility. In addition, much of the regional division of the structure, was originally created for the purpose of administration and tax collection rather than intended for development of the various sectors.

This has resulted in a want for integration of the various activities, for example in the approach to water resources and their management and use. The logical integration is presently complicated by the fact that departments / implementing agencies tasks are so voluminous that operating in a world of their own is already big enough a challenge.

In view of the enormity of the task, the Department responsible for drinking water, the Panchayat Raj Engineering Department (PRED), has focused on quantitative approaches. Targets have become defined as coverage. Activities have focused on construction of physical facilities and this has become an end in itself losing sight of the preliminary objective - *delivery of water.*

The "corporate culture" developed in the implementing agency became dominated by engineering and turnover in terms of construction of structures, with limited attention for operation and maintenance and the actual delivery of drinking water to the rural population.

At its present state of development the concerned Government department is composed of predominantly engineering expertise and perspectives, while actually in need of multidisciplinary perspectives and specific specialist expertise in management, finance, economics, sociology, legislature, among others.

At the same time the increased responsibilities taken on by the Government and the top down system has unwittingly disempowered the beneficiaries, by relieving them of the need to take responsibility for their own needs.

In the process, many of the traditional facilities used by the communities before the State's interventions, have been abandoned as they were replaced by several new generations of facilities. The creation of "new" facilities repeatedly was a favoured method of providing water, rather than review the status of earlier facilities and investment in their realistic rehabilitation. Simultaneously, there was a marked lack of investment in operation and maintenance capability at any institutional level. As a

result, at the time of a crisis, such as a failure or delay in monsoons, failure of major components of a scheme, or simply because of over-exploitation due to increasing number of irrigation wells, existing drinking water supply systems continued to collapse, leading to some villages always remaining partially or fully uncovered.

These developments and their consequences were clearly reflected and observed in the NAP AP II experience, compounded by clear instances of lack in planning, management and documentation. Similar observations were reflected in the Rajiv Gandhi National Drinking Water Mission (RGNDWM) reports and the formulation of targets for improvement in the subsequent 5 Year Plans. An evaluation of the AP II generation of projects by RNE indicated the need for improvements along the lines of the RGNDWM recommendations

1.2 On the Netherlands' side

The early involvement of the Government of Netherlands seemed limited to the role of a funding organisation with very limited advisory and monitoring mandate for the Technical Assistance (TA) during the NAP AP I and most of the AP II generations of projects. With the creation of NAPO in 1993 the monitoring and advisory functions improved and a better understanding of the RWSS sector in AP and its operations has been developed and shared with RNE.

The Technical Assistance extended by RNE through NAPO has taken on a much more active role in assisting the Department in the monitoring of AP II and the conceptualisation and implementation and monitoring of the Initiation Phase AP III. In the process NAPO has assisted the Department in introducing community participation, and improvements in systematic approaches to design and implementation, and general planning, reporting and documentation.

More recently the Netherlands policy on Development Cooperation underwent changes in the direction of a "sectoral approach" which was based on the premise that improved implementation of projects had not resulted in an overall improvement in delivery of drinking water to rural areas. It was based on the assumption that the financial assistance should go to "sectoral" reforms in the water sector, which would gradually evolve. In effect the "new" policy was a major shift of Dutch funding support from "projects" to "Programs".

1.3 Technical Aspects

Related to the institutional aspects, the RWSS sector has by and large operated on the basis of centrally determined policies and standard design criteria for implementation. While this approach has contributed to the construction of a large number of schemes, applying standard design criteria all over India and AP, it has disregarded territorial, topographical, hydrogeological variations, and most importantly, has not recognised local socio-cultural characteristics. (A habitation where cattle is the main source of

income obviously has different needs in terms of quantity and quality, from a place where weaving or agriculture is the main source of income).

Standard design criteria has also overlooked other external factors, such as the lack of regular power supply in the rural areas, or the application of innovations (e.g. Ferro cement, alternative power provision etc). Water Supply Systems were designed and built on an assumption of 16 hours of power supply per day while in actual practice the provision of power varies during the year and is dramatically lower than the assumed provision. This has resulted in a serious increase in demand on the source capacity and the under utilisation of the infrastructure created.

Some of these problems are rooted in predominantly technical and hypothetical perceptions. For example, an OHSR is considered a cost-effective design. However, for an OHSR to be cost-effective, the assumptions are that the storage reservoir, mains and distribution lines are designed and built properly, that sources have adequate yield, that power supply is available for the required duration each day, and that the provision of water is consistent with the design assumptions. As pointed out, it is invariably the case that power supply to rural areas is often 4 to 8 hours per day instead of the 16 hours assumed in the design. As a result the scheme would produce only half its designed volume of water simply for the lack of power. If measured on the basis of quantity of water actually delivered, the cost effectiveness of the OHSR would become questionable.

While the implementing agency has comprehensive technical guidelines, these are generally not followed and leave ample room for improvement. These guidelines cover areas of field investigations, technical surveys, need for detailed designs and documentation, adherence to construction standards and codes, testing procedures to ensure quality of construction and certification of completion.

1.4 Community Participation

Social development approaches have developed substantially in the past decades. From humanitarian and missionary work in the early days, the focus of activities has evolved from community development to awareness creation to community organisation , and now to community-based management. Although the emphasis on focus and jargon has changed, all the main elements are still there and are aimed at development - raising of awareness, building of capability and capacity, empowerment and so forth.

Involving communities and development of community participation seems to have become the speciality and exclusive domain of the Non-Governmental Organisations (NGOs), picking up activities that Government left out. This has led to difficulties in relationships between Government Organisations (GOs) and NGOs. While some NGOs have grown into big bureaucracies themselves, GO and NGO capability and capacity could be considered as complementary.

1.5 The Community

The community is far from a homogenous group. It is divided along the lines of cultural differences, source of income, socio-economic stratification, caste differences, political allegiance, gender and more. To depart from the Gram Panchayat as a unit of planning, would be to depart from a statistical gathering of users, characterised by people residing in a particular administratively determined location, rather than to depart from a meaningful concept of real group with a level of cultural homogeneity, which would sooner be found below the GP level at habitation level.

In addition the rural inhabitants have grown to feel exploited, numb with promises made by politicians and Government and have developed a level of distrust and disempowerment, transformed into a perception of rights or demands from the Government. As a result, habitations can be observed to be guarding their own interest and defensive, rather than willing to share with and help neighbouring communities, in this case by sharing water.

Gender presents a distinct problem that needs special attention, certainly in water supply. On the one hand, women take responsibility for collection, transportation and in-house management of water. On the other hand, they are restricted by men in their participation in groups, contribution to policy, implementation and operation of drinking water facilities.

It is against this background that the Initiation Phase started in Vizianagaram, conceptualised and defined alternative approaches to community owned and managed RWSS.

2. Introduction to AP III

The Government of the Netherlands has assisted the Government of Andhra Pradesh in the Rural Water Supply & Sanitation (RWSS) sector since 1979, through bilateral assistance agreements with the Govt. of India. This assistance has evolved through three generations of projects, referred to as NAP-AP I, AP II and AP III Projects. The Panchayat Raj Engineering Department (PRED) has been the project implementing agency on behalf of the Govt. of AP. Technical assistance to PRED was formalised from 1986 with the establishment of a small Netherlands Assisted Projects Office (NAPO) in Hyderabad, headed by a former Chief Engineer of PRED. The volume of financial assistance in AP I was Rs. 18.25 crores and Rs. 58.7 crores in AP II. AP I and AP II projects were large scale comprehensive piped water supply systems and individual village-based piped water supply systems, implemented at a time when delivery of drinking water was perceived basically as an engineering problem. Particularly, the AP II projects proved an unsatisfactory experience with 200% overruns in both time and costs. Further, its operation and maintenance left much to be desired.

During the implementation of AP II projects, community participation was added as a project activity at a very late stage, with a very limited mandate for hygiene promotion along with the sanitation Program.

The sanitation Program, conceptualised as construction of household latrines and hygiene promotion, was not integrated with the water supply projects. It was conducted in one district only (out of the four project districts) as an experiment. The experiment was downscaled to half the original target and by the end of the project, only a limited number of latrines were constructed, indicating that it lacked priority.

In 1993, during the implementation of AP II, the technical assistance component of the NAP projects was reorganised. NAP Office's mandate became advisory and monitoring services and was staffed with an expatriate Team Leader, Technical Co-ordinator and Social Co-ordinator with supporting professional staff to fulfil these functions. Community participation was expanded from hygiene promotion and integrated into the water supply component. A complete inventory of the designed and "As-laid" facilities of the projects was made and a monitoring system of performance of schemes was instituted.

This inventory and monitoring system identified the following deficiencies in the AP II Program:

- lack of systematic planning, reporting, documentation and monitoring;
- application of standard design criteria disregarding the need for field study and specific characteristics and requirements of the village;
- top down approaches based on engineering perceptions without involvement of the users;
- poor provision for operation and maintenance of the water supply systems and lack of budgets for O&M;

- lack of a management information systems which should have kept the PRED management informed about the progress and problems in the projects;
- absence of efforts towards evolution of a multidisciplinary institution compatible with the increasing volume and complexity of the task at hand.

The origins of the above problems lay in centrally determined policies and the perception that the provision of drinking water and sanitation was mainly an engineering activity.

Since mid-1990s, the existence of these problems gained recognition and acceptance. As a result, the need for a multidisciplinary and flexible approach has increasingly found favour both at Central and State Govt. levels. Implementing agencies such as Panchayat Raj Engineering Department in Andhra Pradesh also professed their commitment to these developments, at least at its higher management levels. This was in conformity with stated policies of the Government of India and the broader international developments in conceptual positions and experiences in the RWSS sector. Though the higher levels of management had a clearer understanding of these problems and subscribed to the need for improvements and changes, little has been done to operationalise this understanding in the institutional setup. Human resource development and human resource management could have been used at implementation levels and provide the necessary training and directives to increase acceptance of these new concepts.

2.1 The AP III Program

The deficiencies observed in the AP I and AP II projects became important lessons for the NAP AP III Program and were used as inputs in its conceptualisation. As a result, AP III was conceived with the key features of:

1. Systematic planning
2. Community participation from the inception
3. Utilisation of groundwater as a source (to the extent possible)
4. Flexible, cost effective and appropriate design
5. Community responsibility for Operation & Management of water supply systems

> *The overall concept of the NAP AP III Program, therefore, was to develop new approaches to RWSS that would promote community ownership and management and field test these approaches on the ground, in order to achieve the main objective of the AP III Program, which was to enhance RWSS policy at State level.*

Similar changes in policy have been recently reflected in the conditionalities of the Central Govt's financial support to State Govts. through the Accelerated Rural Water Supply Program (ARWSP), as stated in the Sector Reform guidelines of Rajiv Gandhi National Water Mission, where user contribution to capital and O&M costs have been made preconditions to project approval.

In view of previous associations with the Netherlands Assisted Projects, Nalgonda was maintained as the location for AP III.

2.2 AP III - Pilot Project in Nalgonda

An investigative study called the Project Reformulation Feasibility Study (PRFS) was commissioned by the Netherlands Government in 1993 in Nalgonda District. While the district had a well documented history of high fluoride groundwater, this study arrived at the conclusion that with the appropriate technical investigation, localised sustainable and low-fluoride groundwater sources could be found, on the basis of which small, sustainable village-level water supply schemes could be constructed.

The NAP AP III Pilot Project in Nalgonda District was formulated on the basis of the findings of the PRFS, which indicated the feasibility of finding potable (low fluoride) water with improved hydrogeological inputs on the one hand and experiences and lessons learnt from NAP AP II Projects on the other. The project proposal outlined a new approach towards RWSS, incorporating community participation, establishment of design criteria, water needs assessments through socio-technical surveys, inventories of hydrogeological resources, systematic groundwater exploration to create sustainable sources, establishment of user-groups, community consultations in the processes of design and construction of schemes and finally transfer of ownership of completed schemes to users for long term management.

An elaborate plan was evolved for accomplishing each of the above steps and to maintain their inter-linkages. The main Project Document of AP III of 1997 from the Govt. of AP to The Royal Netherlands Embassy, New Delhi, (RNE) provides further details of the new approach, as visualised at that point of time.

Project implementation started in Nalgonda in July 1997 and gradually expanded to three Gram Panchayats in three separate Mandals (Kothagudem GP of Narayanpur Mandal, Domalpalli GP of Mungode Mandal and Anthampet GP of Marriguda Mandal). The choice of these Mandals and GPs was governed by the need to gain experience with a representative cross-section of the three main classifications of the problems of high fluorides in groundwater in Nalgonda.

At an early stage, hydrogeological investigations revealed that location of village-level low fluoride groundwater sources were not often feasible. Gradually, it also became evident that there was a very strong reluctance among communities to share water between caste groups, habitations and villages. So, even if low-fluoride sources could be located, proposals to share such sources were firmly rejected by those who happened to lay claim to these water sources. Hence, attempts to establish village-level small schemes had to be virtually abandoned.

In an effort to understand the water quality problems of Nalgonda better, an extensive study was undertaken covering a territory of approximately 600 sq. Km in western Nalgonda, where roughly 1800 wells were inventoried. Water samples from these wells were analysed and the water quality data mapped to identify territories with low-fluoride groundwater. The conclusions of the study indicated that while as a

general rule there was high fluoride content in groundwater, pockets of low-fluoride ground water pockets did exist for a variety of hydrogeological reasons, such as the existence of localised recharge areas, geological faults, etc. The investigations identified seven significant pockets showing low-fluoride groundwater in quantities sufficient to cater to the needs of the population.

Though it was technicially possible to design a network to supply low-fluoride water to the entire area, communities claimed ownership over "good" water within habitations and opposed proposals to share this water with adjoining communities. The solution to this kind of a problem required support from all institutional and political levels.

2.3 AP III Project - Initiation Phase in Vizianagaram

In the course of 1998, PRED came to the conclusion that Nalgonda district, due to its enormous fluoride related problems and very limited groundwater resources, would be too risky for AP III in developing its concept of community management and ownership. Another factor that may have influenced this decision was the high degree of politicisation of the issue of drinking water supply in Nalgonda.

As an alternative, Vizianagaram district was offered as a new project area for reasons of greater receptiveness of local communities and lesser problems in groundwater quality and quantity. This relocation of the project area was accepted by the RNE.

This occasion was considered appropriate to conclude the Pilot Project in Nalgonda and start the AP-III project afresh in Vizianagaram.

The Project document for AP III Initiation Phase in Vizianagaram was drafted in September 1998 by the PRED, identifying 13 Mandals of the district and was accepted by the RNE. It was approved for implementation with an Initiation Phase of one year, with limited territorial scope, to be later expanded as experience was gained with the proposed new approach to RWSS.

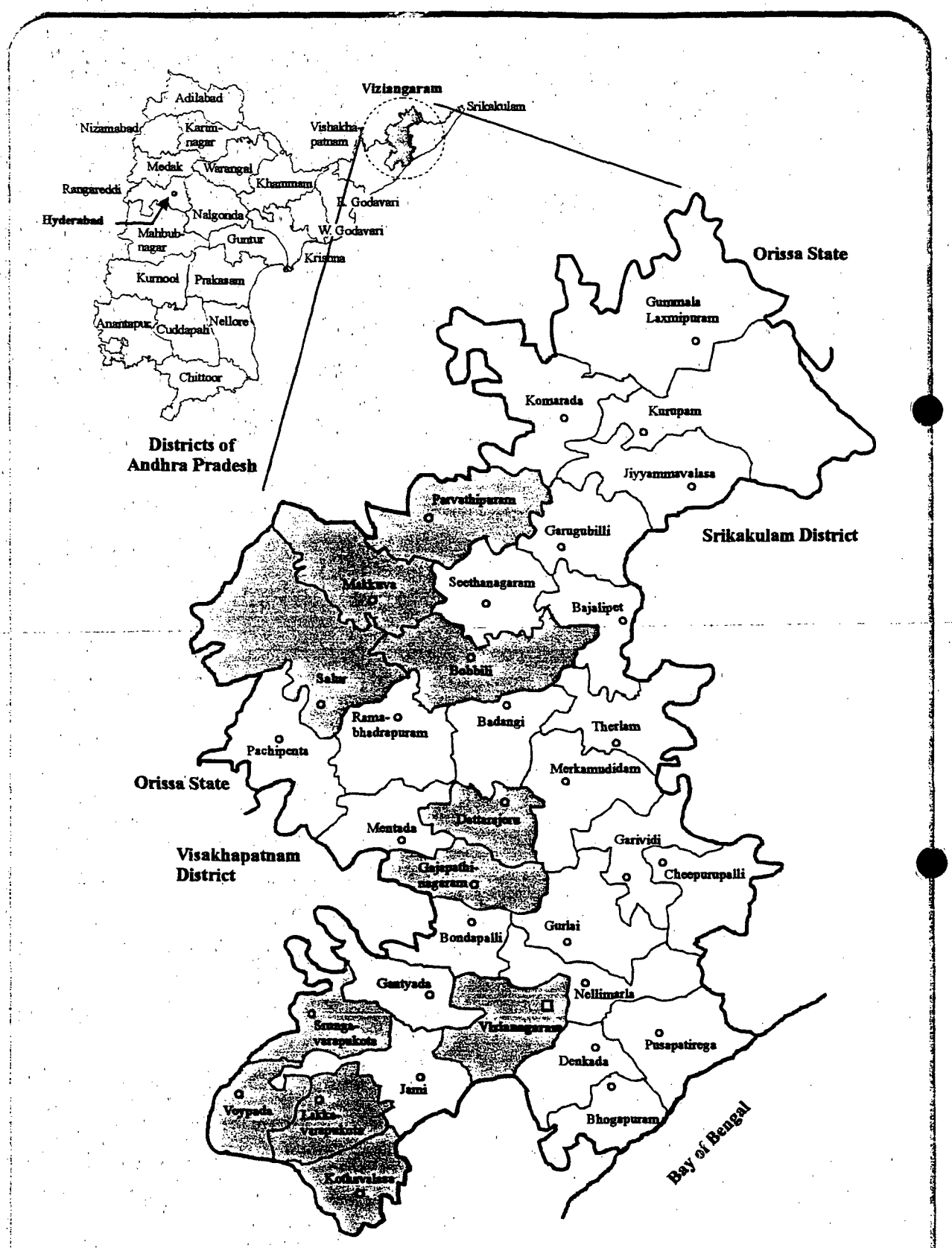
The project started with the establishment of a Special Project Unit (SPU) in Vizianagaram, by the PRED, headed by an Executive Engineer, , and with the selection of work areas in two Mandals - Jami and Gantyada.

The following sections of this report detail the "Approach" that was conceptualised for this project, its evolution and the experiences gained with its application.

By 30 June 2001 at the close of the Initiation Phase, the project had achieved most of the immediate objectives of the Initiation Phase. The project worked in 25 habitations of Jami and Gantyada Mandals where:

- Sampling of existing water sources and chemical analysis was completed in the reconnaissance visits.
- Satellite imagery was used for the analysis of local geological structures and hydrogeomorphological conditions.

- Geophysical surveys using VLF, Electro-magnetic techniques (EM 34) and VES were used to identify suitable drilling sites.
- Yield tests were conducted for assessment of the sustainable yields of existing and new sources.
- All hydrogeological information was compiled in a database.
- Inventory of existing sources and household surveys were used in assessing water needs.
- MANISAs - or Water User Committees - were established in 23 habitations.
- House to house collections of O&M funds by MANISAs was initiated and is ongoing.
- O&M funds have been deposited in Post Office accounts and are administered by presidents and secretaries of respective MANISAs.



Map of Vizianagaram District showing Mandals and AP III Project Area

3. Development of the Approach

3.1 Introduction

The Approach to the project comprised of the following components:

1. Systematic Planning, Reporting and Documentation
2. Community participation (from the inception throughout the project cycle)
3. Utilisation of Groundwater as a source, to the extent possible
4. Flexible, cost effective and appropriate design
5. Community responsibility and finance for Operation & Management of water supply systems

3.2 Systematic Planning

Proper planning was considered essential for keeping control over the timely execution of the project. The planning process set out to integrate various components of the project in a logical and chronological order and list corresponding activities. However being a pilot project, only a rough estimate of time and the manpower for the project was determined.

The planning process, had various levels of involvement. The multiple stages of the planning process involved interaction, to differing degrees, with the implementing agencies as well as the main stakeholder - *the community*. At a macro level, one planning activity was conducted to arrive at the choice of the work area. At another level, there was an overall planning of activities, including sequencing, linkages to all the project components like community participation, technical considerations, managerial components, hydrogeological support etc. This was further refined by a planning process for the sub-activities of the social, technical, hydrogeological activities and establishment of qualitative, physical and financial monitoring procedures for these processes The methodologies followed for each of these stages of planning for the project are described below:

3.2.1 Methodology for selection of Work Area and Habitations

The preconditions for choosing to work in a habitation in the AP III Pilot Phase Project were:

- the assessment of "participatory potential" of the intended user community was positive.
- the existing "Service Level*" for drinking water supply habitation was inadequate.

* Service Level defines the quantity of water available to a population group. The commonly used national norm in an RWS Programs is 40 litres per capita per day (lpcd). However, State Governments tend to use a slightly different norm, of 1 source (hand pump) per 250 persons. A hand pump (India Mark II) yielding 12 litres per minute, would have to work 14 hours per day to provide a service level of 40 lpcd to 250 people. Alternatively, the hand pump working 10 hours per day can meet the Service Level of 40 lpcd for 180 persons. Hence, for the State norm and the

Consequently, it was logical to select "partially covered" habitations where the Service Level was inadequate and where there were positive indications from the intended user community regarding their willingness to take over ownership and management of the proposed water supply scheme in future.

The choice of a work area was dependent on preconditions and criteria, some of which have been mentioned earlier. These were:

- Poor "service level" of drinking water supply
- Poor access to drinking water – "partial coverage"
- Water quality related problems
- Willingness by communities to accept managerial and financial responsibility for O&M of water supply systems
- Geographic, topographic, demographic and social considerations
- Institutional considerations such as suitability of proposals for schemes already under consideration, existing socio-political compulsions, budgetary and administrative limitations, etc.
- Considerations of expediency, i.e., the compulsion to show physically verifiable "progress" by construction of a limited number of schemes, which not only delivered water but would also be a proving ground for implementation of methodologies of effecting take-over, ownership and management of water supply installations by user communities.

In the AP III Initiation Phase in Vizianagaram, territorial choices, i.e., broad identification of Mandals was based on data provided by the PRED. A series of consultations were held between NAPO and PRED during July – August 1998, both at Hyderabad and at Vizianagaram to consider the available information on the status of rural drinking water supply in Vizianagaram District.

Initially, the PRED had designated 13 Mandals in the District as the potential project area with an implementation period of 4 years. However, in view the time limitation set by Royal Netherlands Embassy of 1 year for implementation of the Initiation Phase in Vizianagaram, it was obvious that plans to work in the proposed 13 Mandals would have to be held in abeyance. Expediency demanded that the project focus on a much smaller territory to begin its work.

In order to complete preparatory exercises rapidly without sacrificing its qualitative content, other considerations such as accessibility and existing plans for construction of RWS facilities also assumed priority.

The last consideration for the initial territorial choice was the need to have a degree of variation in hydrogeological conditions (alluvial and hard rock) so as to gain some experience in source establishment procedure.

national norm differ to some degree. In order to realistically estimate the water needs of a community, the investigative processes of the sequence of activities assumed some significance.

At a conceptual level, if the preconditional parameters appeared to be satisfied, then proceeding to the next step, i.e. choice of habitations, was justifiable. If not, then the choice of the work territory had to be reconsidered.

After an initial discussion in Vizianagaram, where data on all 13 Mandals proposed for the larger project for 4 years' duration was considered, it was decided to visit a number of potential work habitations. Such visits were expected to provide verification against the conceptual criteria to some extent, leading to an assessment of the suitability of a work area. Apart from field checks, such visits would also provide first hand impressions and perceptions about access, terrain, and most importantly, an appreciation of local conditions and communities.

These visits would help establish a relative yardstick for comparison suited to that particular area. It was recognised that an absolutely quantitative method of finalising the choice of a habitation would not always be possible to evolve or be valid. Reconnaissance visits would be documented for future reference, as they would provide the rationale for making a choice (or the grounds for rejection).

Annexure 1: Introductory Visit to Vizianagaram, is a record of the proceedings of the workshop in Vizianagaram in August 1998 that took the above parameters into consideration for arriving at the final choice of Mandals for the Initiation Phase. It also provides details of the locations of the reconnaissance visit, which led to the choice of Jami and Gantyada as the two Mandals in which the AP III Initiation Phase Project would begin in Vizianagaram District.

The choice of Jami and Gantyada Mandals was governed mainly by consideration of accessibility, the presence of partial coverage habitations, and on hydrogeological conditions. Both Mandals were easily accessible from Vizianagaram and Visakhapatnam. Hydrogeologically, Jami was anticipated as offering groundwater sources in alluvial conditions and Gantyada as a hard rock territory. Expediency was the last major consideration since identification of a number of "partially covered" habitations had already been done by PRED in these two Mandals.

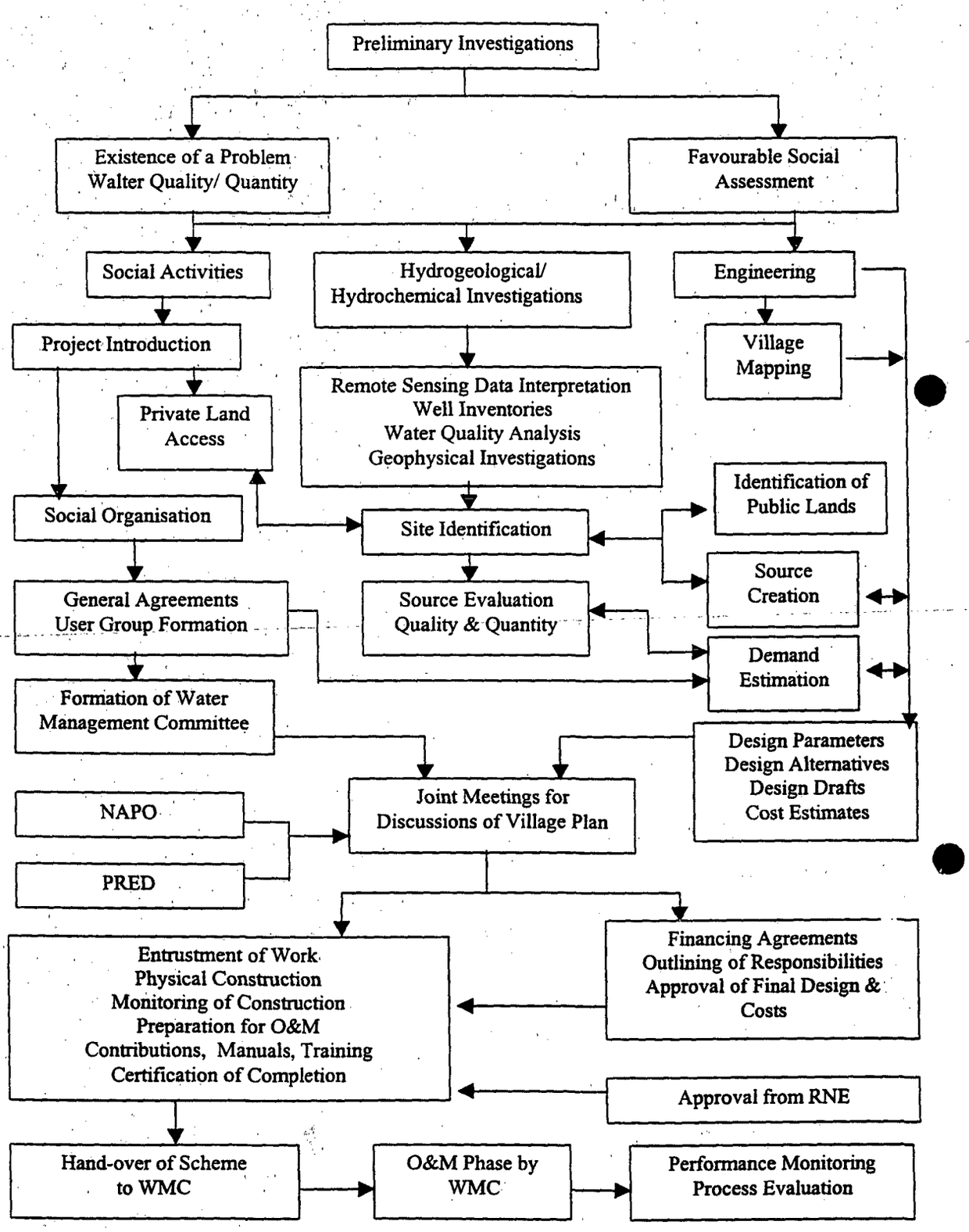
An important outcome of the reconnaissance visit and the inception workshop was the unanimous agreement that the unit of planning project activities would be the **habitation.** Hence, the unit of planning for the project was **not a village** (which may or may not be a single habitation) which was a revenue definition and **not a Gram Panchayat (GP)** (which could be more than one village) which was a political unit.

A habitation was considered as a permanent, distinctly and physically independent rural dwelling place for a group of people living in close proximity to each other.

3.2.2 Methodology for planning of village project cycle

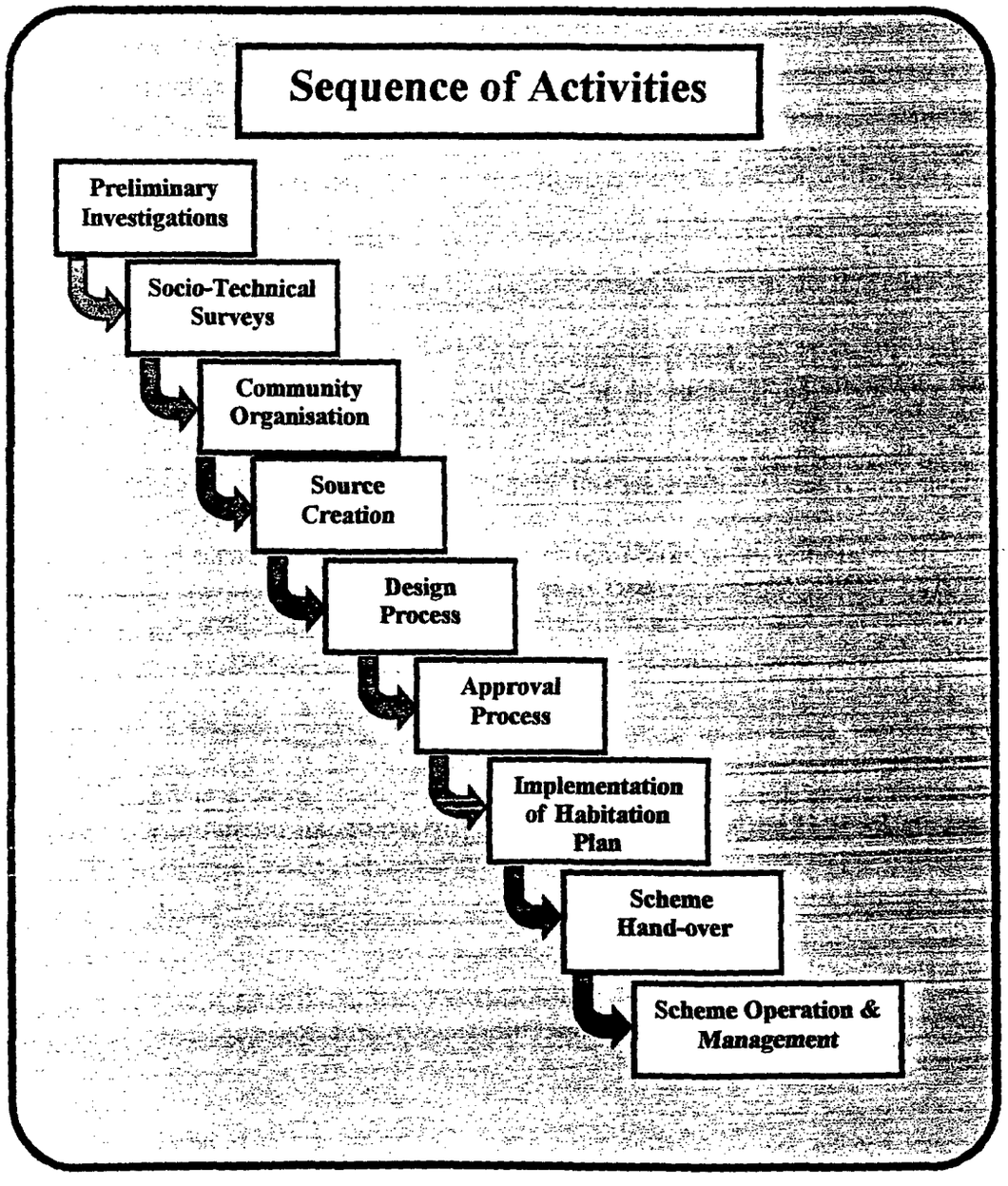
With the planning exercises of territorial choices of Mandals and habitations made by the process described above, the approach to specific activities in the project was developed. The initial conceptual model for establishment of drinking water supply schemes in the AP III Project developed in the Pilot Phase (in Nalgonda) follows:

A Conceptual Model for Establishment of a Water Supply Scheme



3.2.3 Sequence of Activities

In the Initiation Phase at Vizianagaram the conceptual framework illustrated earlier, was further refined to milestones of the project's progress in each habitation. Each milestone was then further broken down into sub-activities under social, technical, hydrogeological and managerial functions. Since integration of these four basic inputs in a logical sequence was essential to achieve the outputs of a particular milestone, constant interaction between the four disciplines and the three entities - SPU, Communities and NAPO, became a key feature in the evolution of the overall approach. This sequence is discussed in detail in Chapter 4.



As the project progressed, methodologies were tested in the field and further refined or adapted. As part of documentation of the process at every stage of the Initiation Phase various reports have been generated which contributed to the formation of individual Habitation Plans.

3.2.4 Methodology for reporting and monitoring

To monitor activities a detailed progress reporting format was developed, indicating milestones. The components of the progress reports were broadly divided into two groups viz., financial progress and physical (non-financial) progress. To the extent possible the existing formats and procedures within the PRED system were used so as to optimise the reporting systems. A third component of reporting and monitoring was on the social activities. Since this component of project inputs was both quantitative and qualitative it did not follow a specified format. The monitoring procedure is discussed in detail in Section 4.7.

Internal monitoring of the progress per village was conducted by PRED on a monthly basis, assisted by NAPO. External monitoring of the progress of the overall project was done by NAP Office, reporting to RNE and GoAP, through Half Yearly Progress Reports. This monitoring system has been used during the entire construction phase of establishing water supply schemes in the project.

After handing over the schemes to the MANISAs, the need for monitoring O&M, system functioning, and various other aspects of scheme management will arise. Formats for all these aspects have been developed and have been integrated into the handover document given to the community. The actual application of these formats will determine if they need further refinement and fine tuning to suit specific needs .

It is envisaged, in the future, that such monitoring conducted by the MANISAs will be reported to PRED, Mandal/District offices, for purposes of information and analysis for understanding and assessing post-handover performance of schemes.

3.3 Community Participation

The project initially assumed that a groundwater based individual scheme would allow much closer links with the local environment and local structures, as water sources are local, if not habitation based, offering a range of possibilities for users to be directly involved in establishing their own water supply systems. This aspect of the project was put to test in the Initiation Phase, the results of which are discussed in Section 4.3 of this document.

This meant that the involvement in the management at the various stages of the village plan: design, execution, and operation and maintenance of the system would be taken up by the community.

3.4 Utilisation of groundwater as a source

Groundwater is a preferred technical choice of source since it minimises the possibility of bacteriological contamination of the source. Such sources could generally be located close to habitations, with a significant implication on scheme costs. It was also a preferred social choice in relation to the strategic advantages to community participation since sources were localised with a greater potential for ownership. In the AP III project, establishing proper hydrogeological investigative procedures prior to source construction and evaluation of source for both qualitative and quantitative yield were preconditions to actual designing of schemes. The process further involved obtaining consent from the community regarding the source option that was decided eventually and has been discussed in detail in Section 4.4. This choice also implied that consent from the community on source options and locations be solicited as an integral part of their participation in the approval process. For example, in Anamrajapeta GP Jami Mandal, PRED had originally planned to set up a comprehensive scheme by using an infiltration well in the river bed as a source. In discussions with the community the preference for localised sources and independent water supply systems was strongly voiced by the main habitations.

3.5 Flexible Design, Cost-Effective Construction, and Sanitation Plan

One of the major lessons learnt in the earlier projects had to a large extent proved that improved water supply facilities would only be sustainable if the offered technical options are manageable and repairable at village level. This implied proper siting and construction of wells, adequate quality of design, construction and supervision of the schemes.

The design of each scheme was adapted to the specific situation in the village, and required a high degree of interaction between the community and engineers concerned with the design of the scheme. Technical options like decentralised storage structures, alternative sources, PSP locations and cost factors influencing O&M were discussed.

In a majority of the villages of the project area , one or more water supply systems already existed. In order to avoid wasting of earlier investment, the quality of all these sources and systems, and the extent to which they may be utilised in the new design was assessed. The rehabilitation of usable existing sources was made an integral part of the scheme construction plan, thus incorporating existing valuable assets in the improved system.

While it was originally intended that communities would get the opportunity to execute components of schemes, in actual practice this did not happen, as the arrangements of SPU and contractors did not create the possibility.

Throughout the village project cycle, linkages with other aspects improving health, such as environmental sanitation and hygiene were made. These aspects include the following and have been discussed in detail in Section 4.5.

- protection of the water source,
- proper provisions for drainage at the RWS exit points,
- users responsibility for keeping the exit points clean
- hygiene promotion to raise awareness on protecting the quality of the drinking water by handling, transporting and domestic storage and use in proper ways.

A sanitation plan was prepared for all the habitations as part of the village plan with the help of the MANISAs.

3.6 Community Responsibilities towards O&M

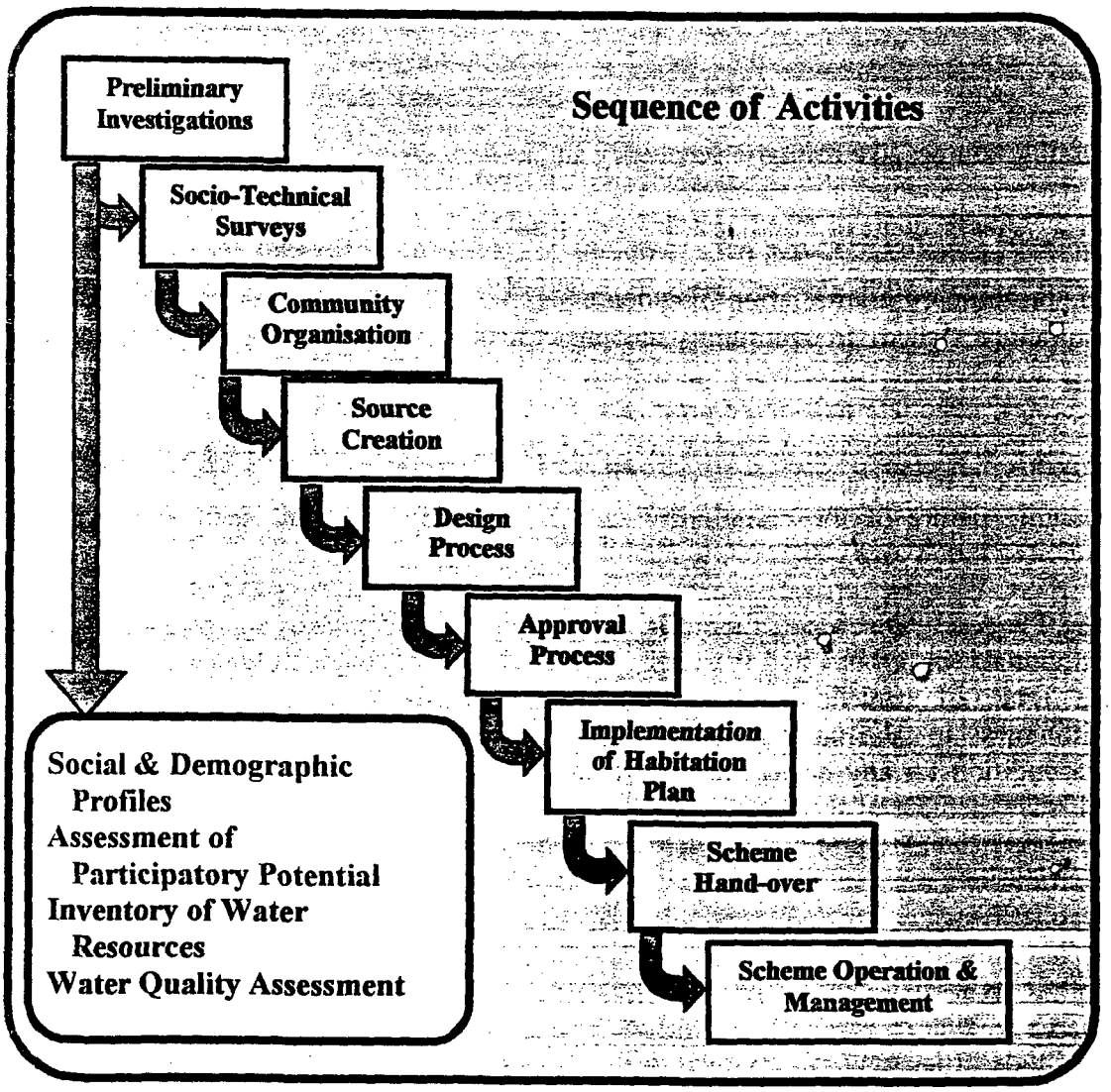
The generation of funds through contributions from the users by the MANISAs for O&M, was expected to be the means to enable the community to look after the provision of water. This was also perceived to be consistent with making the local community own and manage their water supply system. In practice this was translated into establishment of bank and Post Office accounts by each MANISA at an early stage of the project (after design approval), with a target to raise funds equivalent to one year's O&M budget, through regular monthly house-to-house collections of a fixed sum of money from each household of the habitation.

The willingness of communities to work with this approach was established as a precondition at an early stage and was repeatedly emphasised during the project cycle. This has been discussed further in Section 4.5.6.

Constant consultations during preparation of scheme designs, culminating in written tripartite agreements during acceptance of the scheme design prior to construction was also a precondition to any further investment in the project.

4. Sequence of Activities and its Components

The Sequence of Activities, mentioned earlier in Section 3.2.3 and each of its components, are discussed below.



4.1 Preliminary Investigations

Having made the choice of a habitation, preliminary studies were conducted with four main objectives in mind as indicated in the flow chart above. Preliminary Investigation Reports for each habitation was compiled according to a predetermined data collection format which is provided in Annexure 2: Format for Preliminary Investigation Data.

4.1.1 Social & Demographic Profiles

Socio-demographic data collection was undertaken based on a checklist prepared for the purpose. A team from NAPO and PRED visited the Mandal headquarters for discussions with the concerned officers and collection of statistical data from Census, DPEP and Mandal sources. This was followed by visits to the respective Gram Panchayats, where in addition to the verification of information collected, other relevant issues were identified. Discussions both at individual member level and focus groups resulted in getting into the specifics. Through triangulation methods information was cross-checked. All efforts were made to collect information from all possible sources like primary, secondary and tertiary sources.

4.1.2 Assessment of Participatory Potential

The preliminary investigation intended assessing of the participatory potential of the habitations visited. In community meetings the normal practice was that communities tend to assemble, effectively participate in meetings (even if it was only for one meeting), negotiate and make promises with the hope of receiving benefits. In the AP III project ascertaining the participatory potential of the community was crucial as the success of the approach was by and large dependent on this factor. Given the dynamic nature of the community and the experiences of the team with similar exercises much care was taken to handle this issue.

The Process: Discussions were held with a cross section of the community and individuals in groups and the Grama Sabha. This was the main tool used to explain the issue of contributions and other expectations from the community. The willingness to take up responsibility for the water supply system was stated as a precondition for any project activity to begin. More specifically, the requirement of self-management of the water supply scheme involving its repairs and maintenance , managing the Operator, accumulation of one year's O&M budget through household contributions were explained and deliberated in detail. After thorough debate and negotiations agreements were reached on the above issues.

Simple as it may sound, the agreement of the community to accept a participatory approach and responsibility for their water supply system was influenced by a multitude of factors (e.g. political influence, visibility of progress, fulfilling promises, etc). Experience indicates that the initial willingness needed continuous support and stimulus throughout the process of implementation of the project.

4.1.3 Inventory of Water Resources

The study then proceeded to the preparation of a preliminary habitation map, enumeration and crude assessment of the condition and utilisation of water sources, drawing of water samples from these sources for chemical/ bacteriological quality testing, a broad assessment of infrastructure – like schools, medical and transport facilities, basic means of livelihood and initial contacts with local people. The exercise of habitation mapping and source assessment would form the basis for further work to be done in the habitation - social, hydrogeological or technical.

Since a rough map of habitation was to be drawn, a good judgement of distances and directions was essential for the staff involved in this activity. This required an orientation in basic map making. This was done by NAPO for its own staff, who in turn were to establish the process with PRED staff by directly involving them in the map making process.

A rough habitation map was prepared by walking along the streets of the habitation/ village and sketching it out immediately on paper. All important features of the habitation were noted on the map. The important features/ landmarks included:

- The approach road/ roads to the habitation
- Buildings of religious importance like temples, mosque, church etc.
- Buildings of social importance like Panchayat office, community office, anganwadi, post office/ post box, or any other such places of village gathering
- Educational facilities like schools and their classification like primary/ secondary, government/ private etc.
- If the village was connected by a telephone line, its path and location of the exchange.
- Hand pumps with a sequence of serial numbers (or by any existing method of numbering) and details of functionality (working/non-working), utilisation (used/ not used), etc.
- Existing PWS schemes (if any) with details like source, treatment systems (if any), storage points, and outlet points.
- The area, the scheme is catering to, the needs of people, working/ non-working, its efficiency, its shortcomings, etc.
- Any other water sources in use such as open wells, rivers etc.
- Sanitary practices - defecation sites, solid waste, and manure dumping areas

Enquiries with local people provided information about the preference of water sources for drinking, cooking, washing, bathing and other purposes. A first hand assessment of these sources were necessary and existing source locations were marked on the map. Inquires were made to reveal the seasonal variation in the quantity of water from the different water sources. Queries were made about past occurrences of epidemics and outbreaks of water borne diseases, and significant events were recorded

4.1.4 Water Quality Assessment

As mentioned earlier, water samples were drawn from existing water sources to be tested for chemical quality. This aspect of the Preliminary Study has been discussed separately.

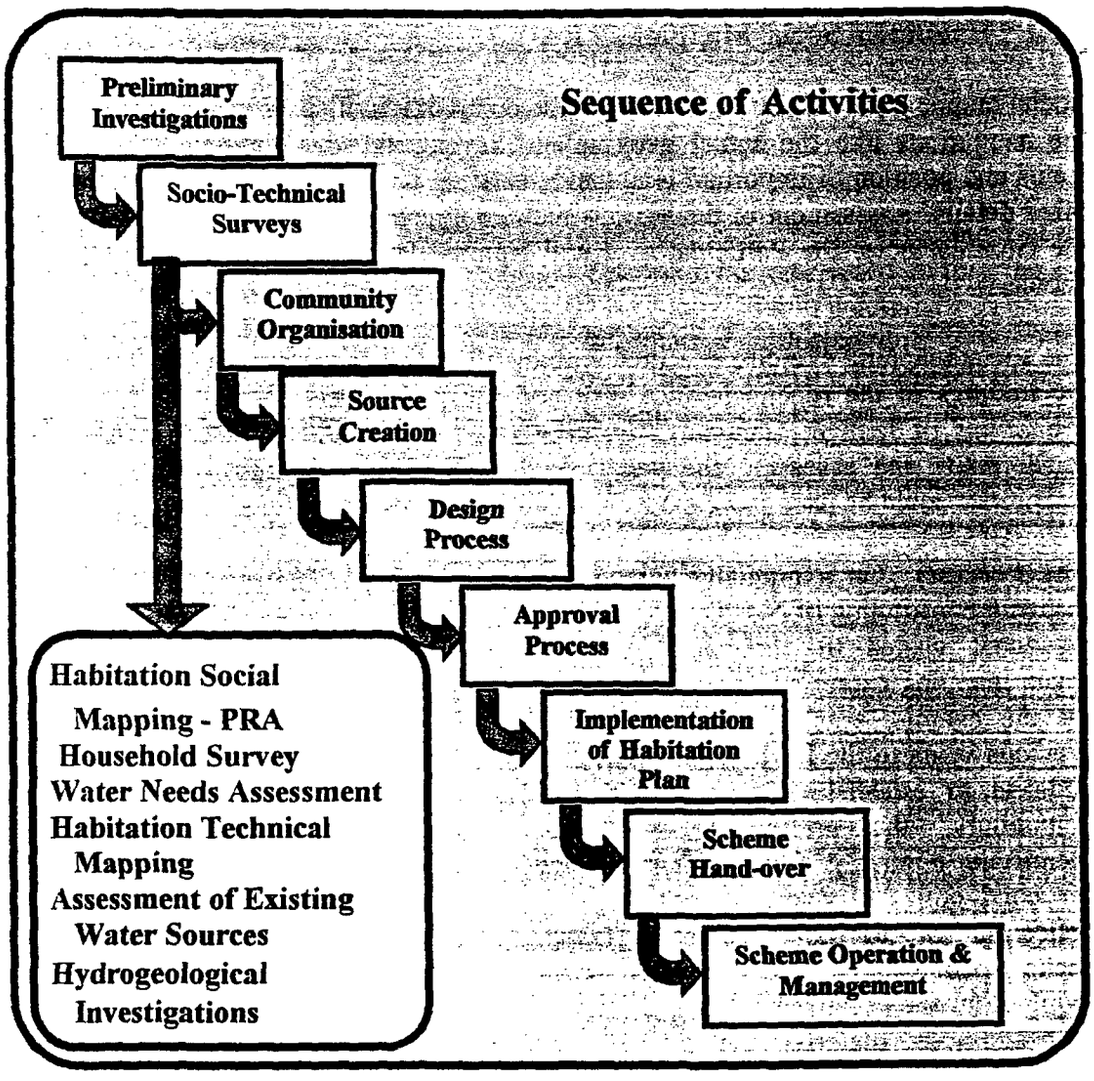
Water sampling at Seethanagarm

An overview of the general sanitation of the village was necessary. Sanitary conditions especially near water sources like hand

pumps, public stand posts and open wells would be recorded. These reports were to serve as a reference for the more detailed habitation study that immediately followed.

Preliminary Investigation Reports were completed for the following habitations:

Date	Mandal	Gram Panchayat	Habitation
14 – 20 August 1998	Jami	Anamrajapeta	Anamrajapeta
			Jaggaipeta
			Seethanagaram
			Pushpagiri
			Harijanwada
			Cheruvulopala
			Kanakalavari Kallalu
Oct -Nov 1998	Gantyada	Chandrampeta	Chandrampeta
		Chinna Manapuram	Chinna Manapuram
		Chinna Madhupada	Madhupada
		Ginjeru	Ginjeru
		Korlam	Korlam
		Pedda Madhupada	Madhupada
		Pensam	Pensam
		Tathipudi	Tathipudi



4.2 Socio-Technical Surveys

The Preliminary Investigation provided clarity on the following questions:

1. Whether the quality and quantity of drinking water was potable and adequate for the community,
2. Could sustainable sources be (hydrogeologically) found,
3. Was the community willing to accept the participatory approach and its consequences for community responsibility.

If these questions were positively confirmed the project would proceed with socio-technical surveys.

4.2.1 Habitation Social Mapping - PRA

Social mapping per habitation entailed: the compilation of specific data pertaining to the habitations like the actual geographical layout, the demographic composition, status and position of important landmarks, existing facilities and their utilisation and other details. Assessment of the various methodologies led to the decision that given the circumstances, the Participatory Rural Appraisal (PRA) technique was the best choice.

The social mapping exercise executed with the PRA technique was an effort to further the findings of the reconnaissance visit and the preliminary study. In the project habitations of Jami & Gantyada, the PRA exercises included compositions of the social maps and assessing the water needs. Experience confirms that the said techniques could be used more extensively and effectively in future interventions.

PRA in progress

The Process: On a mutually agreed day the team constituting of NAPO and the SPU personnel visited the habitation for the social mapping exercise. Preparatory work for the exercise was initiated during the previous visits to the habitations where, in addition to establishing rapport with the community, the preliminary work of identifying contact persons, probable place for conducting the exercise, ensuring the collection of available material (sand, sticks, pebbles, coloured powder, etc.) required for the exercise and other details were finalised. The team also went prepared with additional materials that may be required for the exercise. The preliminaries completed a convenient and central place accessible and acceptable to everybody in the village was selected. PRA was initiated by NAPO team and supported by the SPU. Participation of the community being the key element, all efforts were made to ensure full participation of the members, especially the women.

The habitation meetings proceeded on the set pattern. The team introduced themselves and clearly explained the project key features. Sufficient time was given for the community to update themselves on the various issues presented. While this process was on, the community was gradually drawn into sketching the village map. Initially the active members got involved, but gradually the women and the other members were drawn into the process. On completion of the exercise the map was validated in the meeting and every HH identified based on the street layout. The map drawn by the community was immediately charted and then documented. The social maps though not drawn to scale are fairly accurate and exhibit all the major land-marks of the habitation. Every HH was given a number and the same number was correspondingly used in the preparation of the data sheet for the Water Needs Analysis exercise, which was conducted later.

The social maps are the first important document in the possession of the community. Every habitation has its social map painted on the wall at a strategic place in the

habitation. Further, these maps have been used as the base document on which the scheme designs and service areas are demarcated. An example of a typical social map is attached in Section 4.5.2.

4.2.2 Household Survey and Water Needs Assessment

The AP III approach adopted the principle of realistic water needs assessment at the household (HH) level, rather than adopting the standard norms. Based on this, the HH survey was undertaken and the data collected was compiled into a data-base. The data base was used for further validating the information collected during the PRA exercises. It was expected that the exercise would allow a realistic estimation of water required at the HH, street, and thereby the habitation and the GP levels.

The Process: To arrive at a realistic assessment of water demand, a combination of conventional and participatory methodologies were adopted. The same team having completed the Social Mapping exercise moved on to the Water Needs Assessment (WNA). The exercise involved two interactive sessions with the community followed by desk work. With the use of a simple data sheet, the exercise was carried out in a central place after ensuring the participation of all the community and especially the women. On the basis of the social map, working groups for every 100 houses were formed and each group given the responsibility of listing the names of the head of HH indexed earlier and the corresponding cattle population in the analysis sheet. The data generated through the HH analysis, pertaining to the human and cattle population was further analysed in focus group interviews. The information thus collected was further cross- checked in each of the habitations with 5 households randomly selected for the purpose. In addition the capacity of the standard water pots were also verified. These calculations gave the total water requirement of the habitation.

The format used for the WNA is enclosed as **Annexure 3: Format for Water Needs Analysis.**

4.2.3 Habitation Technical Mapping

Each habitation needed to be surveyed and mapped following Civil Engineering principles using a compass survey coupled with fly levelling.

The Preliminary Study report provided an indication of the features to be surveyed. Detailed guidelines, provided in **Annexure 4: Guidelines for Village Technical Survey**, were prepared for conducting the survey. After the surveying, all the data was plotted to scale and computerised using AutoCad.

The technical survey map was used to evaluate the correctness of the preliminary habitation map, since it would improve future preliminary habitation mapping exercises. The social wing was to be familiarised with the survey map results and its main features, so as to get a fair degree of accuracy while undertaking social mapping. In practice, however, the social mapping exercise tended to precede the engineering survey.

The application of the Survey Guidelines in the project work area was not uniform. Since investigation and preparatory activities started first in the five main habitations of Anamrajapeta GP, Jami Mandal, NAPO's involvement in preparatory activities in these habitations was quite intensive. The purpose in a greater degree of participation in the initial habitations was with the objective of capacity building in the implementing organisation, i.e., the SPU-PRED, so that the procedures could be successfully institutionalised. A secondary objective in an intensive initial involvement on the part of NAPO, was to gain first-hand feedback in the application of these guidelines and refine them in the process.

Hence, the civil surveys and subsequent preparation of survey maps in the first five main habitations of Anamrajapeta GP, adhered closely to a time plan of sub-activities and was of a high quality of technical content and accuracy. However, for reasons explained elsewhere in this document, the standards set in Anamrajapeta GP were compromised both in time planning and qualitative content for the eight habitations selected in Gantyada for the project. Also, the field staff of the implementing agency working in Gantyada were less receptive to efforts to adhere to the application of survey guidelines since it required a high degree of accountability and technical competence. Unfortunately, there were shortfalls on both counts. As a result of these complications and for a number of other reasons, mainly attributable to expediency, the technical inputs by NAPO for the project in Gantyada were curtailed in intensity, and work proceeded further with major variances from the planned sequence of activities from a very early stage.

4.2.4 Assessment of Existing Water Sources

The PRED in Vizianagaram maintained a database on water quality containing information on most public water supply sources in the district, covering most common parameters.

The analysis of the existing data on Jami and Gantyada Mandals showed that out of the 435 water samples analysed, 158 were considered as 'non-potable', which constitutes 36%. This non-potability was mainly ascribed to excess in hardness, total dissolved solids or turgidity. In 6 water samples (1.4%) the maximum permissible limit of 1.5 PPM fluoride was exceeded, while all other measured parameters remained well within limits.

Water Sampling of all Sources: In order to assess the current water quality situation in the selected villages water samples were collected from all public water supply sources, excluding open wells. After some initial verification and cross checking of analytical results, it was concluded that PRED's laboratories in Hyderabad produce the most reliable and consistent results.

Results of analyses carried out in Jami and Gantyada Mandals during the period of Preliminary Studies showed that 37% of the water samples were 'non-potable'. This figure was fairly consistent with the existing data in PRED's database. The reasons for non-potability were due to high electrical conductivity, excessive total dissolved solids, hardness and nitrates.

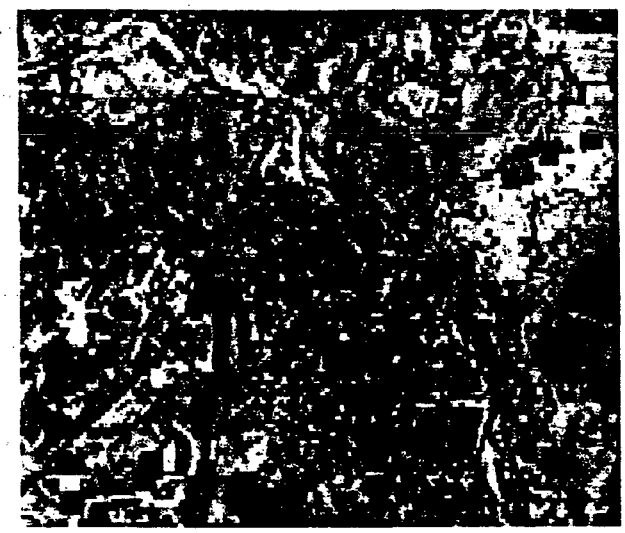
A review of institutional water quality analytical capabilities, led to the assessment for the need for consolidating and upgrading the analytical facilities of the PRED, Vizianagaram. This led to construction of the Water Quality Monitoring Laboratory operated by PRED Vizianagaram.

The results of water quality analysis were maintained in a MS Excel data base. As the project progressed and as additional water samples were analysed, this data was also added to the database. This information is attached as **Annexure 5: Water Quality Data.**

4.2.5 Hydrogeological Investigations

The hydrogeological activities followed a sequence of preparatory exercises that were slightly different and independent in some aspects.

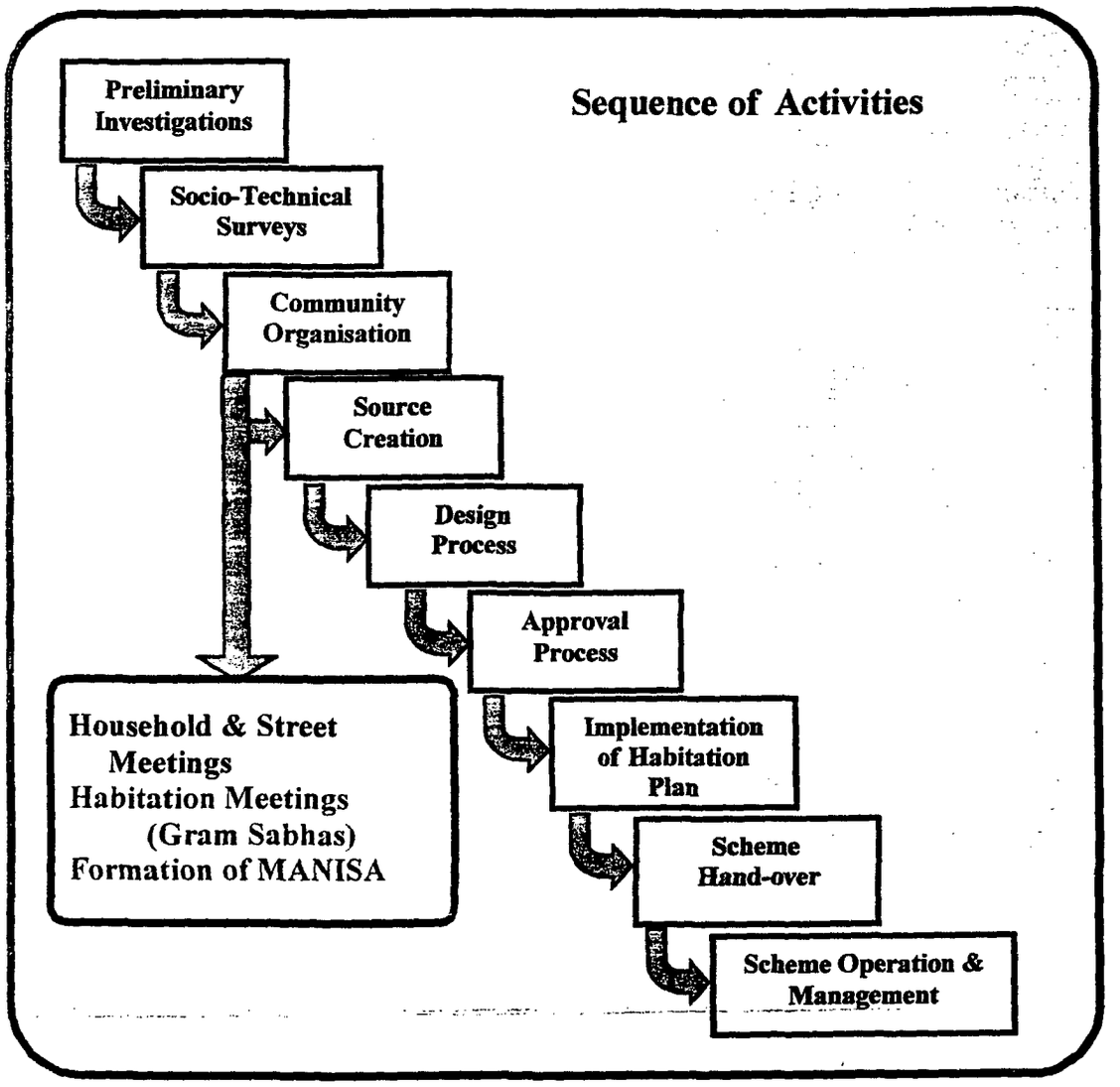
Satellite Image and Aerial Photo Interpretation: Aerial photographs of the entire district were available at the State Groundwater Department, both at Hyderabad and with the District Office in Vizianagaram. However, Vizianagaram was identified as a "restricted area". Hence the aerial photographs were regarded as classified information and were not available to the project.



Satellite Image of Anamrajpeta GP & its vicinity

These restrictions did not apply to satellite images. The project acquired multispectral IRS-1C digital data of the entire district on CD-ROM with a resolution of 24 meters from the National Remote Sensing Agency in Hyderabad. Panchromatic images with a resolution of 5 meters were also acquired for the project area. The images were interpreted at NAPO, Hyderabad.

Preparation of Village Base Maps: For every village, a multispectral image was enhanced with panchromatic data using ILWIS software. The resulting base maps were printed out in full colour at 1:25000 scale and were used for analyses of the local geological structures and hydrogeomorphological conditions which resulted in the identification of favourable aquifer zones. The resolution of the images however, was not good enough to construct detailed village maps with individual streets and houses. The village maps that were drafted during the socio-technical studies in the villages were used to that extent.



4.3 Community Organisation

4.3.1 Household, Street & Habitation Meetings

The AP III project's objective is establishment of community owned and operated water supply systems. Effectuating active participation of the community becomes essential from the inception phase, if tangible results are to be witnessed. Facilitating and motivating the community to agree to the project objectives has been a dynamic process. Establishing community contacts became the prerequisite for initiation of activities in the habitations. Frequent meetings at the habitation levels were intended to ensure effective participation of the members in all the project activities Establishing contacts for negotiations was approached from various angles. While the larger community and their consensus was the focus, no less attention was given to the fact that the individual HH support was equally important. It was from this angle that during the habitation/village visits all the HH were visited, followed by street wise meetings and finally the community at large in the Grama Sabha.

The initial visits to the villages/habitations were undertaken by the PRED field Engineers followed by visits by the NAPO team and later by the SPU- Social desk, with the objective of establishing rapport with the communities and familiarising them with project objectives. Each group had a specific agenda/task to be discussed with the community, but made sure that the issues discussed during the earlier meetings were restated. Ultimately, it was expected that the communities would come forward to shoulder the responsibility of operation and management of their own water supply Program under the auspices of an organised structure, the water management committee. (here after referred to as MANISA).

Every HH in the habitation was visited, contacts established and the importance of their participation in the Program explained. Introductions, discussions and deliberations took place at the individual, HH and the habitation/village level and the participation of the members, especially women encouraged. Following the house visits, street meetings were convened, where people belonging to that particular street were explained the project objectives and their support solicited. A number of people also used the opportunity to freely express their opinions, which may have been difficult in the larger group. Negotiations on a one-one basis further helped in entailing community support for the project. This experience also helped in strengthening community inter-personal relations, which was assessed as a great investment for the future.

4.3.2 Formation of the MANISA

The operationalisation of the concept of community owned and operated rural water supply system was planned through a body at the village level called the MANISA. The word MANISA emerged in an Orientation workshop during project initiation which means; MANISA = MA (Manchi = good) + NI (Neeti = water) = SA (Sangam = group). The process of formation of the MANISA by and large across all the habitations has been uniform. This uniformity in approach has been derived as a consolidation of the earlier experiences of NAPO in the formation of the water committees in AP I & AP II. The formation of the MANISAs has been the culmination of a number of steps. The process has distinctly two aspects. - The first step involved the preparatory activities and the second the actual process.

Preparatory Activities: The preparatory activities mainly focussed on building the confidence and the capabilities of the communities to take on the mantle of self - management of the RWSS Program. The first step involved specific interventions focussed on facilitating identification of potential candidates, followed by guided decision making where subsequent meetings with the community leaders at various levels helped to further consolidate matters and obtain support from the vested interest groups to not only assist in the process but also to conduct the deliberations in a democratic way. The same opportunity was used to present the following non-negotiables:

- Each street will be represented by two people- one of them preferably a female.
- Equity, demographic coverage, caste, class representation, are essential in selection of members.

- Members should be above the age of 21 and of sane mind and a healthy disposition.
- The members should hold office of any one post in the village.
- The final ratification of the members should take place in the Grama Sabha called for the purpose.
- In the final tally a minimum of 30% should be women, 50% women representation is ideal and should be aimed at.
- Of the office bearers at least one has to be a woman.
- The meeting proceedings should be recorded in the MANISA minutes book.
- All permanent residents of the habitation are considered eligible to become members and office bearers of the MANISA as long as they actually reside in the habitation and do not engage in temporary or seasonal migration. Political interference and manipulation should be avoided.

The second step involved the formal meetings with Sarpanch /GP Members/ Community leaders. In the Grama Sabha the program objectives were broadly explained to the community and the need to form the MANISA reiterated. The third step involved street wise /small group meetings, planned and organised ward wise, group wise and street- wise, where the groups were informed about the need to come to a consensus on the choice of their (two) candidates per street/water point, (one being a woman), to be ratified in the Grama Sabha on a later date. The fourth step involved educating, enhancing the knowledge and understanding of the people on a number of issues specifically related to RWSS and its management so as to enable them to identify/select the most suitable candidates to be on their MANISA. This was followed by a number of awareness building activities addressing issues related to RWSS, health and hygiene and other pressing village issues in addition to the issue of the O&M by the MANISA/Community themselves.

The Process: On the agreed date, the selection of the MANISA members took place in a democratic way. In the Grama Sabha called for the purpose, after stating the non-negotiables the name of each street was called out and the members/ families residing in that particular street suggested the names of two individuals of their preference. The same procedure was followed for all the streets in the habitation. Finally, when all the representatives were selected, they were asked to assemble before the Grama Sabha where the Grama Sabha expressed its opinion, approving or demanding for the replacement of a particular member as the case may be. Finally, when the said process was completed, the Grama Sabha was asked to applaud their acceptance.

Grama Sabha in progress

Selection of the Office Bearers: The same platform was used for the selection of the Office bearers. The selected members now constituting the MANISA were asked to come to a consensus among themselves and elected the Office bearers. The same procedure of approval and acceptance of the Grama Sabha was followed. The entire procedure was recorded in the minutes book.

The Process in smaller Habitations: The process in the smaller habitations was very much in line with the process adopted in the larger habitations. Initially the line of discussions with the communities was that the MANISA could be formed in the main habitation with representations from the smaller habitations. However, the smaller habitations were particular to have their own independent water supply scheme and therefore an independent MANISA, as experiences of the past of linking up with the larger habitations were not very productive/conducive to them. In addition, often these habitations got victimised during any kind of political, social or economical disturbances. However, after making a proper assessment of the governing social factors and looking at the technical / economic feasibility, a decision was taken to support their demands. It can be quoted as an excellent example for social process influencing the technical options.

The Status of the MANISA: The need for providing a legal status for the MANISA has been an issue of many debates since project initiation. Consultations and discussions held at various levels, including the ones with the legal adviser to the GOAP did not help the project gain much clarity. In the absence of any clear mandate emerging from any of the quarters, the need for organising such workshops to deliberate on the Functions, Roles and Responsibilities of the MANISAs was realised.

In the spirit of participation, the members of the MANISA were made to list out their roles and responsibilities, as perceived by them in a workshop organised for the purpose. The outcomes of this workshop became the working document for the next level of workshop at SPU, where these findings were further refined. The draft proceedings of the workshop were further deliberated upon at NAPO level and finalised. These proceedings became the working document for the MANISA for a period of 6 months. In the second round of workshops the proceedings were further deliberated upon, and refined. In all, two rounds of workshops at three different levels were held and the final outcome is documented as the Roles and Responsibilities of the MANISA. It is envisaged that in the eventuality of the MANISA getting a legal status, this document will be reviewed for its suitability.

For the future it is recommended that the legal status of the MANISA should follow the options suggested in the Sector Reform Program being implemented by the State Government.

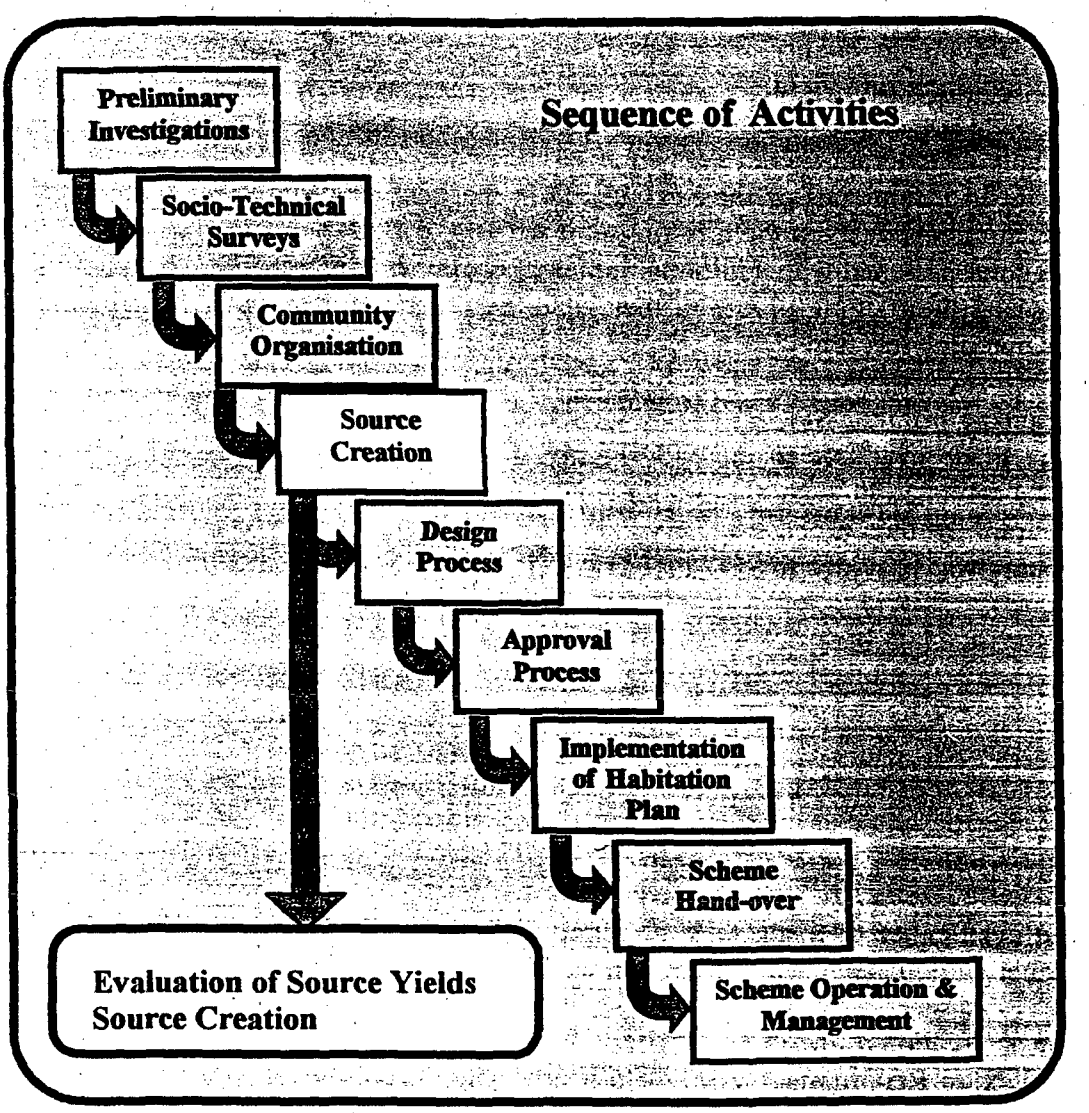
Functions of the MANISA: The status of the MANISA also depends on the capability of the MANISA to handle various functions. Outcome of various discussions and deliberations at different levels and the subsequent assessment of the possibilities for shouldering enhanced responsibilities by the members, based on the experiences of similar projects, resulted in the document - Functions of the MANISA. The expectation is that this document will be further refined and included in the required format at the time of finalisation of the status of the MANISA.

A detailed note on the MANISAs and their Roles and Responsibilities, as stated in the Handover documents to communities, is provided in Annexure 6: The Water Management Committee - MANISA.

MANISA Re-organisation: November 2000 saw the completion of two years of office of all the MANISAs in both the Mandals. An assessment of performance outputs of the MANISAs indicated that across all habitations MANISA members could improve in taking more initiative and get more involved in the day to day activities related to the RWSS or others. Assessment of roles revealed that contrary to the non-negotiables agreed upon, some of the members were holding more than one position which resulted in overburdening of the member. Experiences of dealing with the communities clearly show that they often exhibit tendencies of loading additional and non- related responsibilities onto the MANISAs. In addition, the fact that the same members get repeatedly involved in other activities also weakens the concept of community sharing responsibilities. Hence, across both the Mandals and in all the habitations the reorganisation of the MANISAs was undertaken following the same procedures adopted in the Formation of the MANISAs. It is interesting to note that by and large across all habitations the same members got re-elected, but with a few internal changes in the respective positions held.

MANISA Apex Body Formation: The need for the formation of the Apex body has been an offshoot of the discussions on meeting the one - year O&M collection. Further the need to streamline the O&M collection and deposit the same in a fixed deposit also raised the need for a more organised set up. Verification of the O&M collections across the habitations revealed that there were certain genuine reasons for the expected 100% O&M amounts not to be mobilised. The need to have a body to represent the case of one/all habitations on similar issues was strongly felt. The issue was discussed elaborately in a number of community meetings. It was decided during the meetings that Anamrajapeta being one GP, the possibilities of such a move could be first tried out. As a result the Sarpanch and the village elders took it upon themselves to address the issue of backlog of O&M funds and the possibilities of supplementing the same from other sources. In this direction efforts were made to meet with the local Sugar cane growers co-operative and mobilise funds.

A number of meetings later, the APEX body was formed in the presence of the Sarpanch, village elders and the sugar cane growers co-operative members. The nominations for the membership were sent by the respective MANISAs which included not only the members but also the co-opted members. In all the General Body of the APEX body has 24 members of whom 19 are from the MANISA and 5 are co-opted. From among the 19 members, 9 were selected for the Executive Body. After much discussion, the group decided not to have Office Bearers as they did not want to give any one person an upper hand. However, two signatories for the transactions of the business were selected. At the time of handover of the schemes the Apex body had only convened once or twice and had not yet begun transacting business. It is expected that with the inputs provided in the earlier training Programs and workshops the Apex body will themselves be able to handle issues, though not to the expected degree of perfection.



4.4 Source Creation

4.4.1 Evaluation of Source Yields

Assurance of sustainability of the water sources was a basic technical premise on which designs of the corresponding water supply system were founded. As a first step in the process of establishing sustainability, the water quality of all public water supply sources was established as a part of the Preliminary Investigation procedure.

In the second stage of investigations of detailed Socio-technical studies, Yield Testing of all public water supply sources with acceptable water quality was done to determine the second aspect of source sustainability, i.e., its yield.

After the water quality of all public water supply sources was established, sources with acceptable quality were tested by means of a step-drawdown yield test to ascertain their safe yield.

Initially an external agency was engaged to conduct these tests. This agency was also engaged to train staff of the SPU-PRED in the field procedures of conducting yield test. Simultaneously, a yield testing unit with the PRED that was in a state of disuse, was commissioned with additional inputs of equipment and repairs. After the first few tests and the training phase, further yield tests were conducted by SPU/PRED with this pumping test unit.

Field data from the SPU-PRED on yield testing was analysed at NAPO and the results were made available to the SPU-PRED. The Hydrogeologist of NAPO worked in close conjunction with the Jr. Geologist, SPU-PRED. A manual and a computer Program for data processing of yield testing field data were prepared by NAPO and training was provided to SPU-PRED staff in the use of this methodology.

Of the total number of 27 existing public water supply sources tested, 9 were found to be potential sources for piped water supply.

The extent to which yield testing has been institutionalised, as a means of establishing one aspect of source sustainability, remains to be assessed.

4.4.2 Source Creation

The availability of a sustainable source was a primary condition to proceeding any further with the technical design of a water supply scheme.

The application of the Design Criteria (refer Section 4.5.1) led to the computation of a Production Requirement value or a source yield capability in litres per minute that would satisfy the projected water demand at the end of the designed life of each scheme.

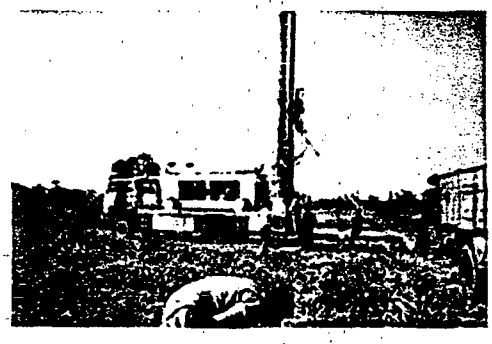
Comparison of source capacity computations based on projected demand, with yield test results of existing sources made it possible to decide whether existing sources had yields suited to meet the future long term demand of the water supply scheme. If a suitable existing source was not available, then hydrogeological investigations were undertaken to locate a potential new site.

At early stage of the project it was proposed by the PRED to solve the water scarcity problem in Anamrajpeta village by means of a comprehensive water supply system based on one infiltration well in the nearby Gosthani river for all the Jami habitations. However the communities of the different habitations of Anamrajpeta expressed a preference for individual habitation-level systems. Unreliable bacteriological water testing results and the people's preference for individual schemes lead to hydrogeological investigations seeking potential drilling sites.

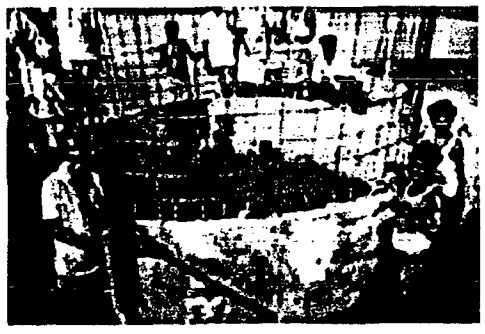
In order to improve the well siting methodology, three types of geophysical instruments were used by the project: ABEM Wadi, ABEM Terrameter and Geonics

EM34. On the-job-training sessions were conducted to familiarise the local PRED staff with the equipment and the interpretation of data.
Most drinking water wells in hardrock areas in the district were being drilled using high powered DTH rigs owned and operated by private companies. No filter screen nor gravel packs were used and the collapsible strata (overburden) were sealed off using blank steel casing pipe. Wells in unconsolidated material were mostly drilled by hand up to a maximum depth of 20 m.

The project villages in Jami Mandal were underlain by alluvial strata. For these wells a different construction method was introduced. The wells were constructed with a combination rig according to a well design consisting of blank casing and slotted pipe, a gravel pack and proper grouting. Due to the non-availability of proper well construction material the first well failed while all others were completed successfully. Wells in hard rock areas were drilled using a private DTH rig according to the specifications given in a separate Tender Document.



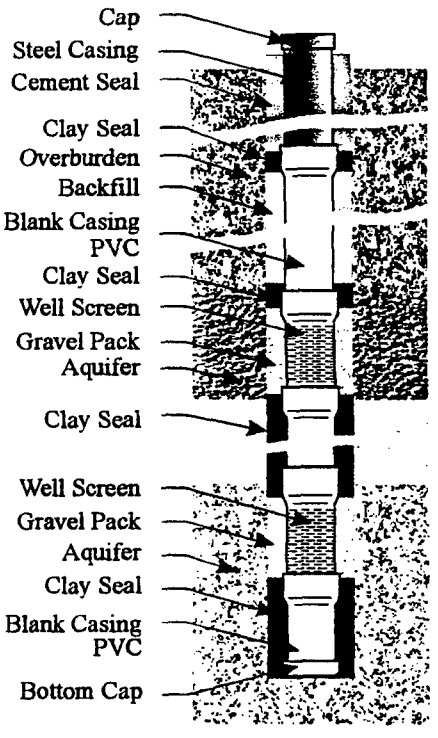
Well drilling at Korlam



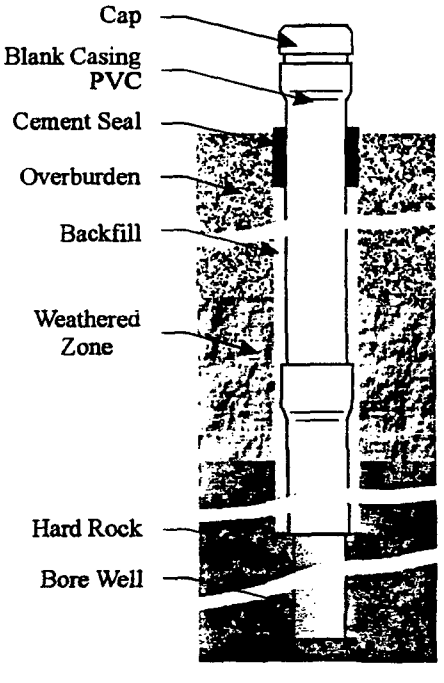
Infiltration Well at Pedda Madhupada

In some habitations of Gantyada Mandals with unconsolidated formations, test drilling by hand was used to verify the presence of high yielding strata after which a combination rig should have been used to drill the production wells. However, due to a lack of appropriate priority to this activity by the implementing agency source creation in some cases was substantially delayed. Achieving the same results by drilling with rotary drilling followed by hard rock drilling, using two different machines, also met with a high degree of problems and source failures, primarily due the absence of the necessary managerial inputs from the implementing agency. At Pedda Madhupada an infiltration well was constructed after a test well was successful.

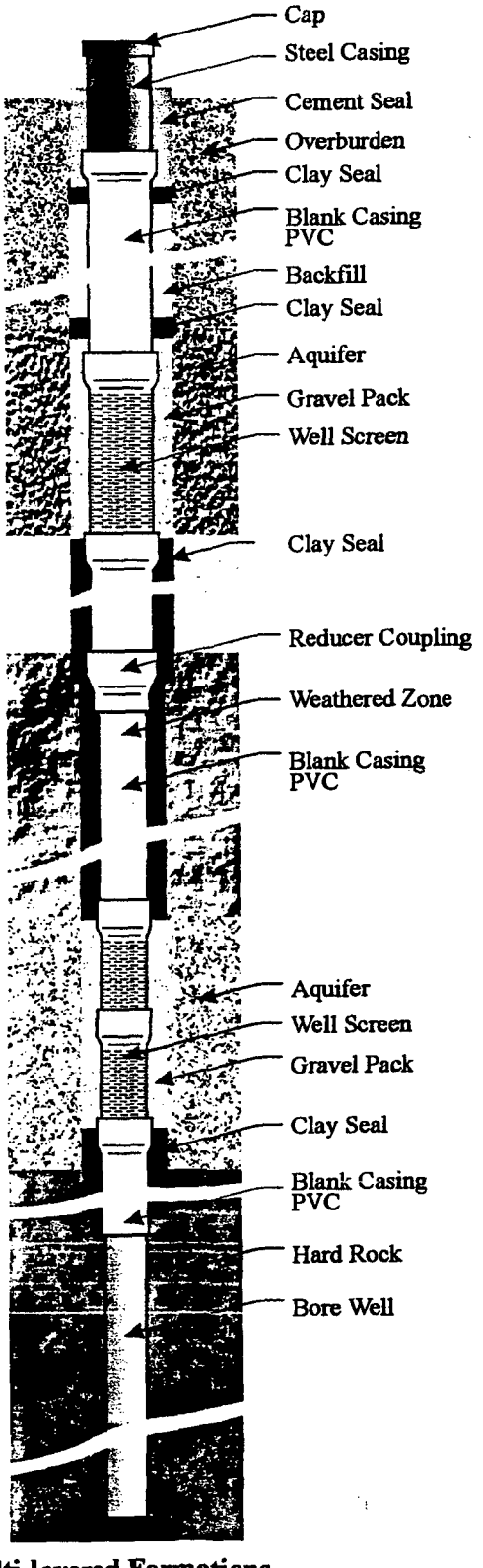
The diagram of a typical well section follows.



Alluvial Formations

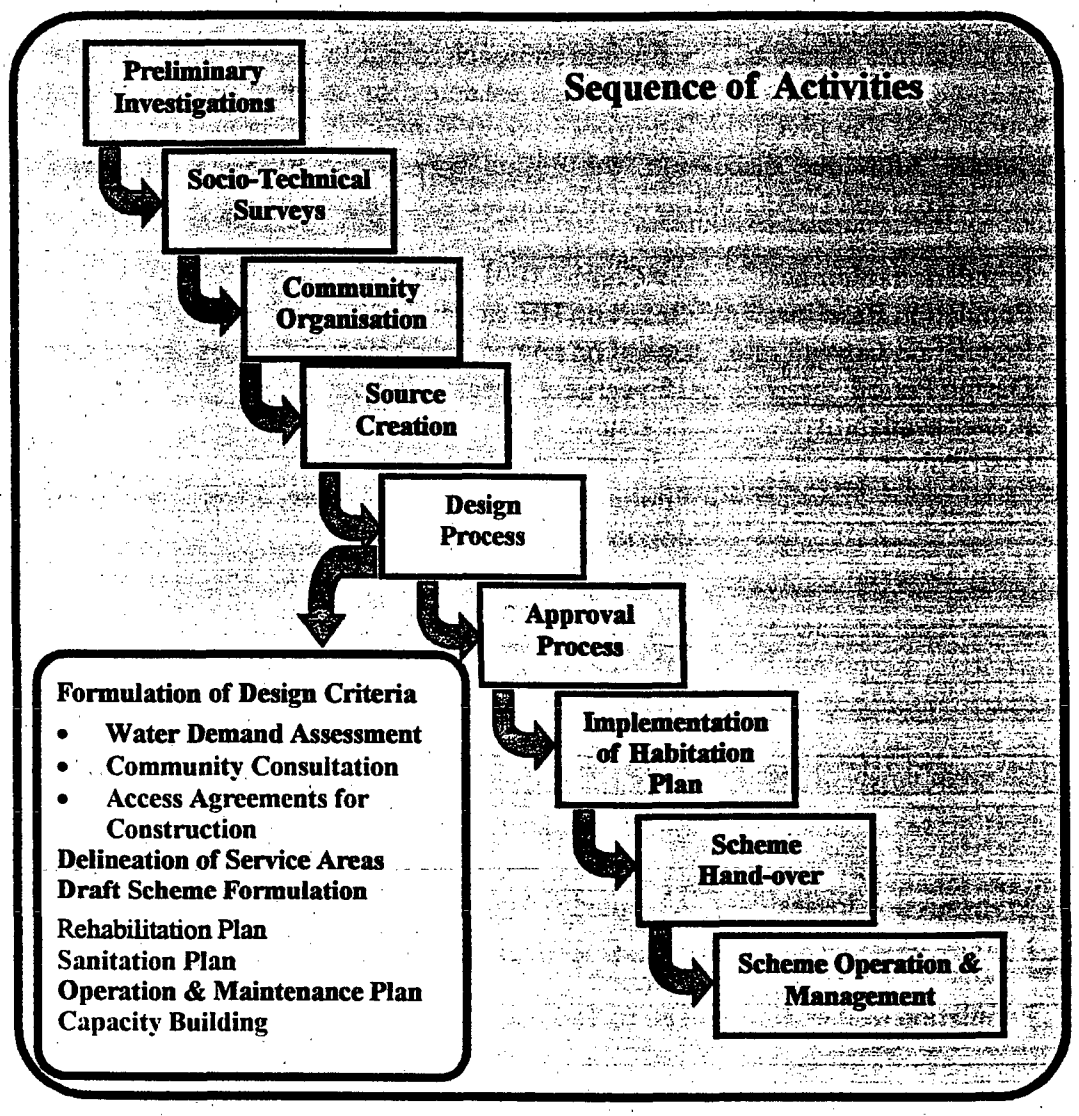


Hard Rock Formations



Multi-layered Formations

Typical Well Designs in different formations



4.5 Design Process

Designs of specific schemes evolved by going through a series of steps listed below:

4.5.1 Formulation of Design Criteria

Habitation Planning Workshop: The Habitation Planning Workshop, held in late January 1999 at the SPU Office, Vizianagaram provided the first opportunity to discuss the technical issues of design of schemes at a conceptual and strategic level. The outcome of the Workshop is appended in **Annexure 7: Habitation Planning Workshop.**

The point of departure for formulating design guidelines was to list RWS-PWS guidelines currently in vogue (based upon CPHEEO's Water Supply Manual) and

examine the relevance of these guidelines. It was agreed that the AP III Project's design guidelines should have a flexible approach to suit local conditions and realities. For example, there was no basis to design schemes for continuous water supply, for 24 hours of the day given the interrupted power supply situation and unknown yields of sources. After due discussion, the design criteria for PWS Systems agreed to between PRED and NAPO in this Workshop are summarised below:

Population reference:	By Census 1991/ 2001
Population Baseline:	Based on HH survey
Population Growth rate:	Based on comparison between Census & HH Survey
Design Period:	15 years for Scheme & Source
Power availability:	10 hours
Distribution :	8 hours (two shifts, 4 hrs each morning/ evening). Public stand posts at street level. No household connections.
Daily Demand:	Present & Projected : (In litres per day as per HH Survey and converted to service level in lpcd both for present and projected population)
Service Level:	Not necessarily to meet the full present or projected demand. To take into consideration that existing source will continue to meet part of the total demand. Source capacity to also be a consideration when determining service level. Generally Service Level to be around 40 lpcd.
Transmission losses:	Assumed at 20% of total production
Storage Capacity:	50% of total daily demand where storage systems are planned
Population to PSP Ratio:	150 to 180 persons per Outlet

Additional parameters that would influence technical choices and design would be:

1. The need for sub-reservoirs as service points, if necessary (e.g. in the case of schools).

2. Renovation of existing water supply sources and schemes which would continue to meet part of the total water demand. Hence it would not be necessary for the new schemes to meet the total projected demand. As a guideline, new schemes would be designed to a delivery level of up to 40 lpcd but this would be assessed against actual water needs assessments from household surveys.

3. New water outlet points would be located near existing hand pumps and open wells to take advantage of an already established social practice of drawing water within the habitation and to minimise the waste water disposal problems.

4. MLSRs would be constructed to meet needs of neighbourhoods within a habitation, and each MLSR would serve two to three outlets. This would

decentralise supply and assure a degree of autonomy within neighbourhoods, once its MLSR was filled. It would also foster localised management of supply within neighbourhoods.

5. A combination of concrete drains and earthen channels would be constructed for all new sources and outlet points. Such drainage construction would form a comprehensive waste water disposal infrastructure, taking existing sources also into consideration and form an integral part of the scheme design.

6. Drinking water needs of outlying small but permanent settlements or sub-habitations around the main habitations would be met by installation of hand pump on new tubewells.

Water Demand Assessment: Processing the findings of the Habitation Study and Household Survey (refer Section 4.2) led to an enumeration of the population of the habitation and an assessment of the water needs of each household.

The application of the above Design Criteria to Household Survey data led to the computation of population of each habitation at the end of the design period of 15 years of 2013 AD. With the projected water demand for each habitation computed and with water quality and yield test results confirming the sustainability of the sources to meet these projected demands, the essential criteria for formulating designs were fulfilled.

The data gathered on the project habitations in Gantyada and Jami Mandals, pertinent to the assessment of current water use and future water demand, is presented in **Annexure 8: Water Demand Assessment in Jami and Gantyada Mandals**. This analysis was further refined to arrive at assessments of the present demand for water for each street or neighbourhood of the habitation and corresponding projections of demand at the end of a scheme's designed life period of 15 years.

While computations for Water Demand were completed as per the above procedure and used in the design process, it emerged at a much later stage of the project's implementation that the demographic data gathered during the habitation studies were inflated.

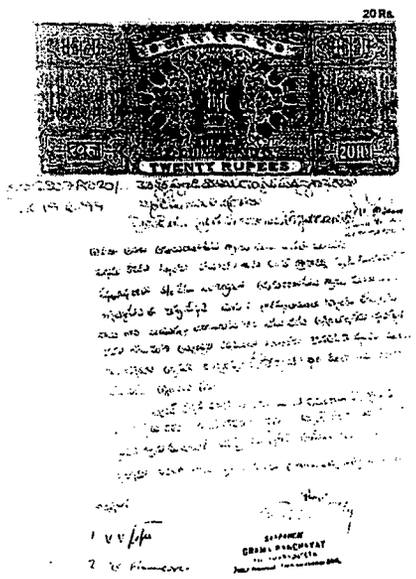
It appears that the exaggeration of population and household figures occurred in most habitations probably because communities had the impression that higher populations would automatically mean higher financial outlays in scheme construction. However, this did not happen since schemes were not designed on a per capita investment norm but on a factual demand assessment and corresponding design and estimate. Hence, with inflated demographic data, schemes tended to be somewhat over-designed.

A more significant implication of this problem was that the initial O&M budgets on a household basis appeared relatively low. When the problem became apparent and when the demographic data was corrected, the per capita capital investment rose as did the projection in monthly contributions required from each household for O&M.

Community Consultations & Access Agreements:

Community consultations were an ongoing process while the scheme was going through its initial stages of investigations and source establishment. In most habitations, the formation of MANISAs had progressed to an advanced stage during the initial stages of project activities.

As a part of the process of constitution of MANISAs, tripartite agreements, similar to memoranda of understanding were entered into between the communities (by MANISAs with the endorsement of Gram Sabhas), PRED (the implementing agency) and NAP Office. Refer Section 4.6.2 for details.



A typical Tripartie Agreement

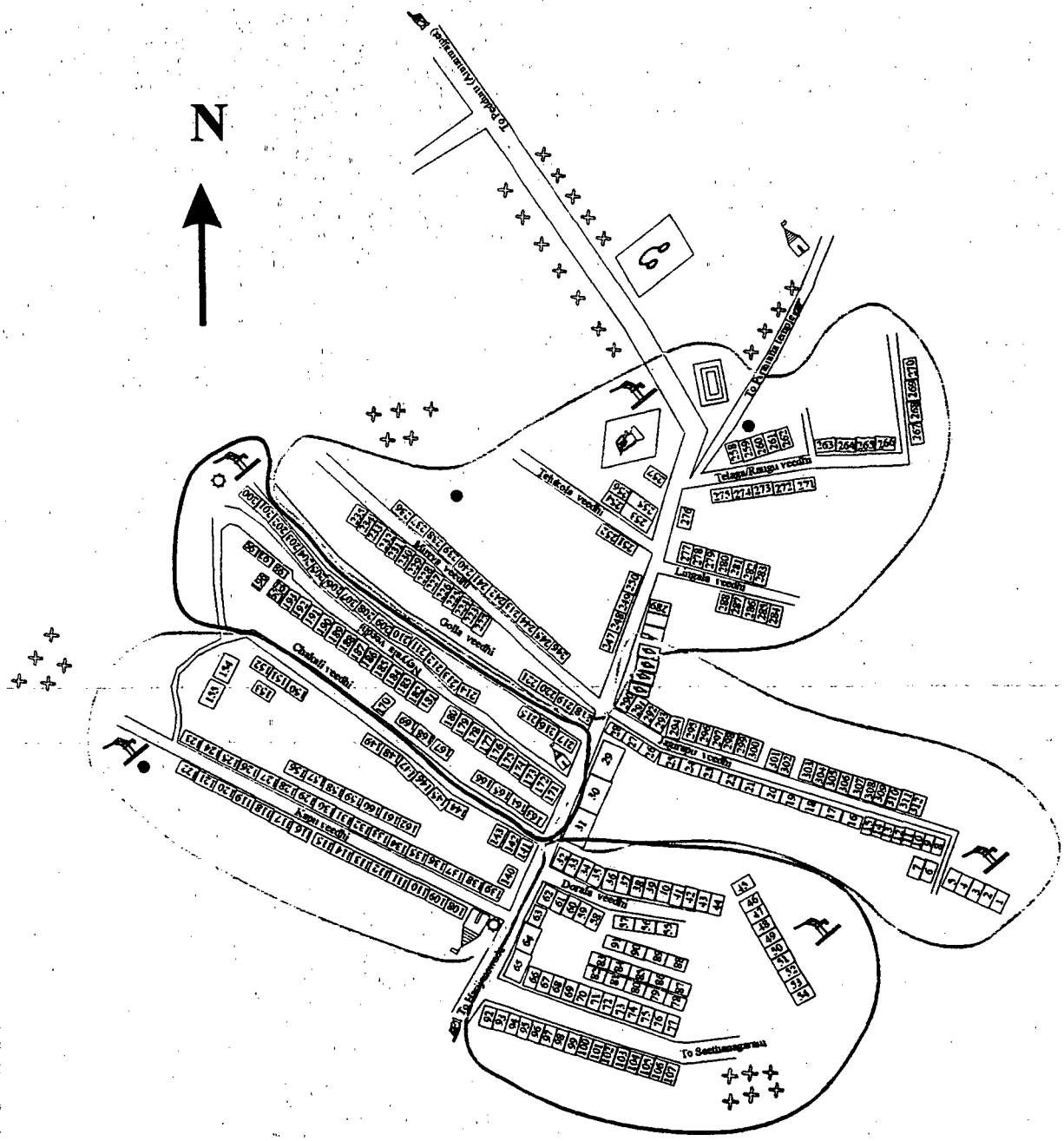
4.5.2 Delineation of Service Areas

The social map of a habitation documented the existing water drawing preferences and patterns. This was a graphic representation of the "service area" of each existing water source, giving a clear indication of people's preferences for particular sources based upon convenience and social stratification within the habitation. A typical Social map with service area demarcations is attached.

The layout of the outlet points (Public Standpoints - PPS) of the new water supply system attempted to conform to the existing water drawing pattern, as far as possible. In practice, the new system was designed to provide a more liberal access to water. Hence, a number of new outlets would fit within an existing service area and integration of a number of PSPs to an MLSR often tended to conform to this older service area.

This methodology was used to fix tentative locations of PSPs on both the social map and the engineering survey map. Visits were then made to the habitation, where intensive and public interaction occurred between the project staff and the community to get near-final agreements from households and streets for locations of sources, PSPs, MLSR tanks, access to pipeline laying paths and drainage layouts and to resolve disputes on these matters on the spot.

Using the principle of service areas, it was possible to start technical designing from lowest and most crucial level of the scheme – the PSP and its catchment of households and resolve all issues at that level with field checks and discussions. Upward integration of the scheme for location of MLSRs and layout of pumping main and drainage paths followed quite logically, since the smaller segments of the scheme had already been negotiated with users at the street, neighbourhood and household levels.



Legend

- Temple
- Gram Panchayat
- Hospital
- Rachabanda
- HouseIndex
- Openwell
- Hand pump
- Hand pump Service Area
- Manure pit
- Defecation sites
- House of Sarpanch
- Grocery shop
- School

Social Map - Jaggaipet, Annamrajpet GP showing Service Areas

This process of making the technical task of designing, sensitive to the social realities of the "community", was done with the intention of ensuring a greater autonomy to users over their water, not only by decentralisation of storage structures but also by taking cognisance of people's practices and preferences.

Designing of schemes proceeded once a sustainable source had been identified or constructed and tested for quality and quantity to assure sustainability.

As mentioned earlier in Section 4.5.1 - Design Criteria, new outlet points would be located near existing water sources to take advantage of an already established social order for drawing water.

4.5.3 Draft Scheme Formulation

The drafting of the scheme design was approached with the objective of meeting the design criteria. MLSRs would be constructed to meet needs of neighbourhoods within a habitation. This would decentralise supply and assure a degree of autonomy within neighbourhoods. It would also foster localised management of water supply within neighbourhoods.

With the help of the technical survey map and the social map, the location of storage reservoirs were finalised. Usually it was preferable to have the reservoirs on elevated ground. The position of the outlets were finalised given due consideration to:

- The number of people it serves
- Accessibility of the outlet vis-à-vis the houses
- Drainage consideration
- Other considerations such as schools, places of social gathering etc.

From drainage considerations, it was always preferable to have the outlet point along the periphery of the habitation. In practice, this aspect had to be compromised often since it was directly contradictory to the considerations of convenience and ease of access.

Once the source was finalised, tentative outlet points fixed, storage points demarcated and drainage paths located, the Social Wing of the project was appraised of the draft design.

Standard hydraulic computations and structural designing techniques were used to draft specifications of components of a scheme. When all the above aspects of scheme design were located on the survey map, the draft design emerged.

Bill of quantities of the components of the scheme were prepared to arrive at tentative costs. Having prepared the scheme components, and arrived at the cost involved in the scheme construction, the O&M costs were also projected on certain assumptions.

It needs to be re-emphasised that the process of designing of a scheme was interactive, evolutionary and dependent on a variety of inputs.

Social activities like household surveys and water needs assessments made it possible to arrive at realistic quantification of water needs.

Water quality and yield estimates of existing sources indicated if these would suffice for future needs or not. These assessments also determined the need for locating new sources, which in turn led to further assessment of water quality and quantity. Eventually, the quantity of water available would affect the service level and compromises would have to be made in case the desired quantity of water was just not available.

Implications of choices like centralised vs. decentralised storage, public vs. individual house connections, waste water disposal problems, utilisation of existing sources, all needed to be considered since each choice had social, economic and technological implications and since users had to be presented with the alternatives to make informed choices.

4.5.4 Rehabilitation Plan

It was expected that existing water sources would continue to remain in use after completion of the new RWS system. An integral part of the design was the consideration that it would not be necessary for new schemes to meet the total projected demand. Hence, renovation of existing water supply sources which would continue to meet part of the total water demand was also a part of overall water supply picture.

Information from Preliminary Studies and detailed Habitation Studies, supplemented by visits to each existing source, was used to arrive at a realistic assessment of the rehabilitation needs of each existing source.

A combination of concrete drains and earthen channels would be constructed for all new schemes. Such drainage construction would form a comprehensive waste water disposal infrastructure, taking existing sources also into consideration and form an integral part of the scheme design.

4.5.5 Sanitation Plan

Visits to the villages by the social, technical, and hydrogeological teams often witnessed the unhygienic conditions prevailing in the habitations. Water quality tests revealed that the water collected in the vicinity of the village had high nitrates, often a result of contamination of human and cattle waste. In a majority of the habitations this was a problem. Added to this, the practice of dumping garbage close to or around the water sources had to be addressed. The absence of a planned drainage system and indiscriminate waste disposal resulted in the streets getting slushy and drains getting clogged. Prevailing defecation practices and the trotting of the cattle through the village further compounded the sanitation problem. Hence, the need to address the sanitation issue in a planned manner became absolutely necessary. Meetings organised at various places and levels aimed at making the community aware of their unhygienic surroundings and the need for them, as residents to take action.

As a result, initially, some of the members who were interested, took up related activities on a voluntary basis, but this did not yield the expected results. Hence, the issue was reviewed and decision taken to address the issue in a planned manner which resulted in the emergence of Sanitation Plans.

The Process: The exercise of drawing up a sanitation plan was executed habitation-wise as a guided activity. The process involved calling for a MANISA meeting specifically for the purpose and listing out various issues that needed to be addressed at the HH, street and the village level. The issues were further discussed and prioritised depending on those that needed immediate attention, which fitted into the short-term plan and those that could be drawn into a long-term plan. The plan also had provision for the inclusion of specific names of MANISA members who would be responsible for specific actions. The matter was discussed in the meeting and a consensus reached. Some of the issues that were addressed as requiring regular monitoring by the MANISA included: waste disposal-removal, shifting of the household waste/village waste, garbage pits, manure pits and the defecation sites. The issue of hygiene promotion was addressed through the use of media and linkages established with the PHCs & the District Medical & Health Officer (DM&HO). The exercises were intended to try and bring about changes in habits so that gradually it would become a way of life. Further, linkages with the other line Departments were also established. The objective of these exercises, however, was to ensure that the MANISA and community get habituated to shouldering this responsibility in the absence of any external intervention, and would make all efforts to take the community forward in the direction of being a clean and healthy village.

This format is provided in **Annexure 9: Sanitation Plan Format.**

4.5.6 Operations & Maintenance Plan

In the Design Process, the formulation of an O&M Plan was at two levels.

Firstly, with the drafting and tentative costing of a specific scheme, an annual O&M budget was also drawn up. This budget provided for maintenance of existing hand pumps at the standard State Government approved rate of Rs. 750 per pump per annum. The O&M budget for new piped water supply schemes, where they were constructed, was on the basis of provisions for Operator's salary, repairs to the pump (lump-sum provision of Rs. 4000 per annum) and a pro-rata (1% of scheme construction cost) provision for other repairs.

This annual O&M budget was then apportioned equally among the households in the habitation, to arrive at monthly household contributions required to meet the O&M expenses of the scheme.

At a second level, during the constitution of the MANISAs, the need for communities to take on the responsibility of O&M was an issue which was discussed and agreed upon across all habitations as a non negotiable. This acceptance was established in the form of a tripartite agreement between the MANISA, SPU-PRED and NAPO and witnessed by the GP Sarpanch. This also became the beginning for the collection of a one year O&M fund. It was made mandatory that the communities had to collect the

equivalent of a one year's O&M budget during the construction period of the scheme. The issue of payment for O&M became a compulsory and standard item in the agenda in all the meetings organised in the habitations since project initiation. Frequent interactions with the different teams visiting the village further helped the community to understand the importance of taking responsibility for the O&M.

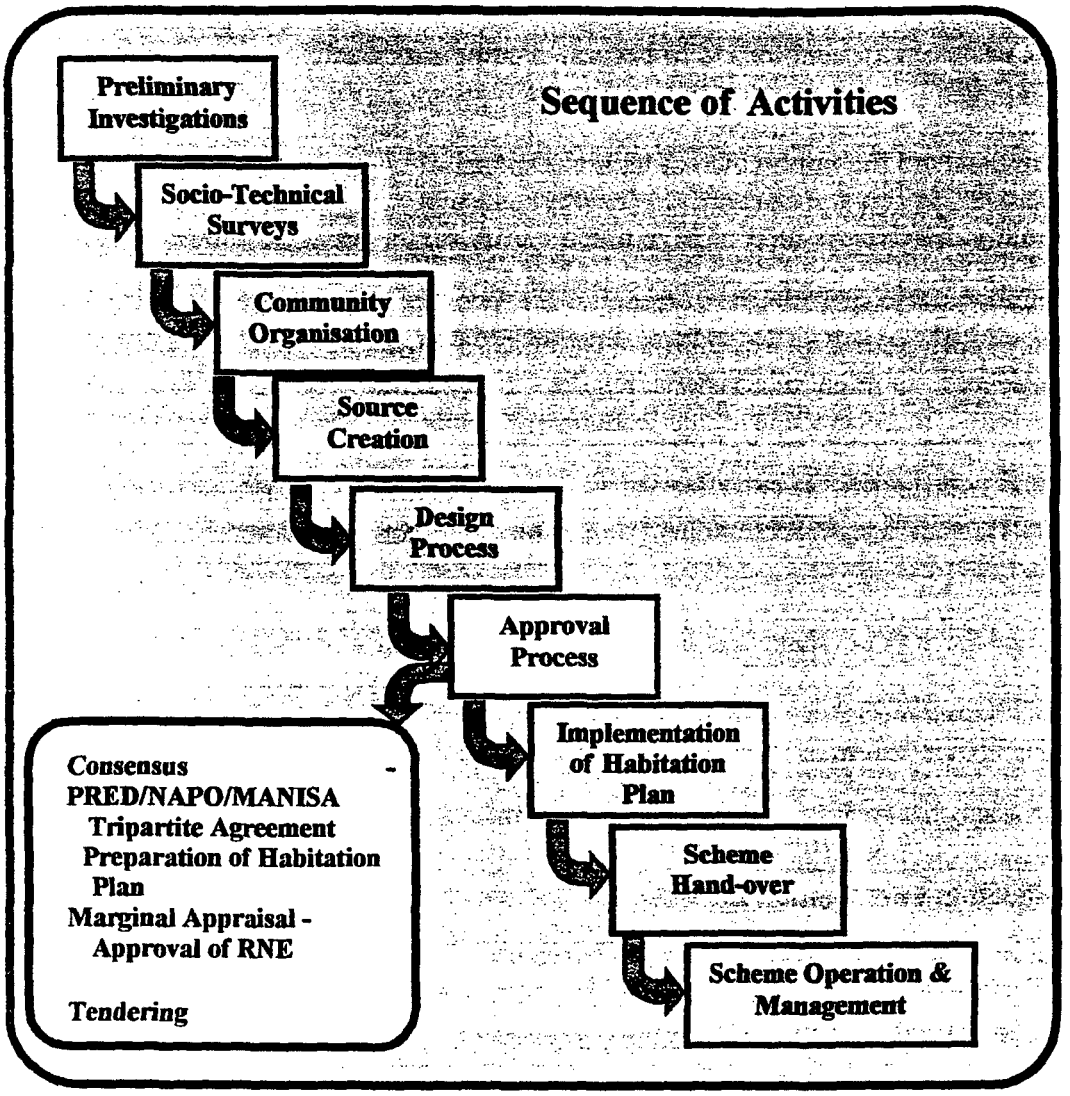
Initially, MANISAs did not have much clarity on the mode of collection and amount to be collected for the O&M fund and as such, mobilisation was initiated more as a token contribution. The finalisation of the draft designs also resulted in the community getting clarity on the amount of contribution expected from each of the household. Guided discussions resulted in chalking various plans. Involving the MANISA members and other leaders in the community resulted in the MANISAs taking further interest and mobilising the required amounts. The amounts so collected were deposited in accounts in the local Post office in the names of the respective MANISA, in a joint account held by the President and the Secretary.

All MANISAs have their accounts opened in the local Post Office. Preference of choice for a Post Office has been due to the fact that a majority of the habitations do not have access to a Bank, but have to the Post offices. An added advantage is the fact that the people in these habitations have the experience of operating accounts in the Post Office. A detailed O&M plan per habitation has been worked out with the community.

Formats used for management of O & M funds are provided in **Annexure 10: O & M Collection and Monitoring Forms.**

4.5.7 Capacity Building

Capacity building initiatives for the stakeholders in the project has been an integral and ongoing process throughout the project. Consistent efforts have been made from the inception phase to identify the training and capacity building needs of the various partners. The capacity building initiatives of the project have been addressed in detail in Chapter 7.



4.6 Approval Process

The next step in the sequence of activities was the Approval Process, where the project proceeded to include the more material aspects of construction. The sub-activities of the Approval Process were:

1. Consensus - PRED/ NAPO on Scheme Design
2. Tripartite Agreement - PRED/ NAPO/ MANISA
3. Marginal Appraisal- Approval of RNE
4. Tendering

4.6.1 Consensus on Scheme Design

The application of the Design parameters to each habitation's household data, social map and engineering map led to the formulation of designs of components for each scheme.

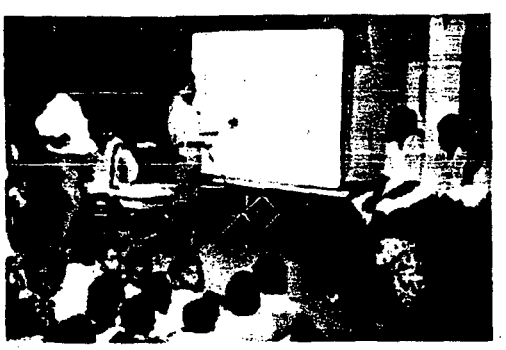
In the case of the four schemes of Jami Mandal, the consensus of scheme design was through a continuous process of interaction between SPU and NAPO. As mentioned earlier, the scheme components were located on the survey map and a draft abstract of costs was also prepared. Once preliminary design and estimates had been completed, the MANISAs were invited to the SPU office and draft designs were discussed in detail with respective MANISAs.

In case of the schemes with Gantyada, the situation was somewhat different. As mentioned earlier, the map preparation activity suffered. As compared to its relatively intense involvement in the project process in Jami Mandal, NAP Office was required to distance itself from the process in Gantyada.

The basic guideline of using MLSRs for storage structures was not adhered to for all the eight schemes. Scheme designs were finalised for Gantyada, with 5 schemes based in MLSRs, 2 schemes based on single large OHSR and one scheme on an Elevated Service Reservoir. Community consensus on these schemes were obtained by PRED more as a matter of form rather than a serious consultative procedure.

After drafting the schemes, a date was fixed with the MANISAs for the presentation of draft scheme designs for their approvals. The proposed designs, costs involved, and the O&M costs for smooth and efficient functioning of schemes were explained to respective MANISAs. Having taken the MANISAs into confidence, the communities in the habitation were also be appraised of the salient features of the scheme thorough discussion with respective MANISA members. Doubts raised by communities were clarified to their satisfaction, both socially and technically.

Design discussions with MANISA



Design discussions at the habitation

4.6.2 Tripartite Agreement on Habitation Plan

After the above preparations, the SPU-PRED once again presented the details of the Water Supply Scheme, including its capital and O&M costs, Sanitation Plan and O&M Plan in Gram Sabhas to the communities. After approval from communities on all the components of the Habitation Plan, tripartite agreements (provided in **Annexure 11: Tripartite Agreement**) were signed between members of MANISAs, as representatives of communities, and the Executive Engineer of PRED as the implementing agency, along with the Sarpanches, and representatives of NAP Office as witnesses.

4.6.3 Marginal Appraisal - Approval of RNE

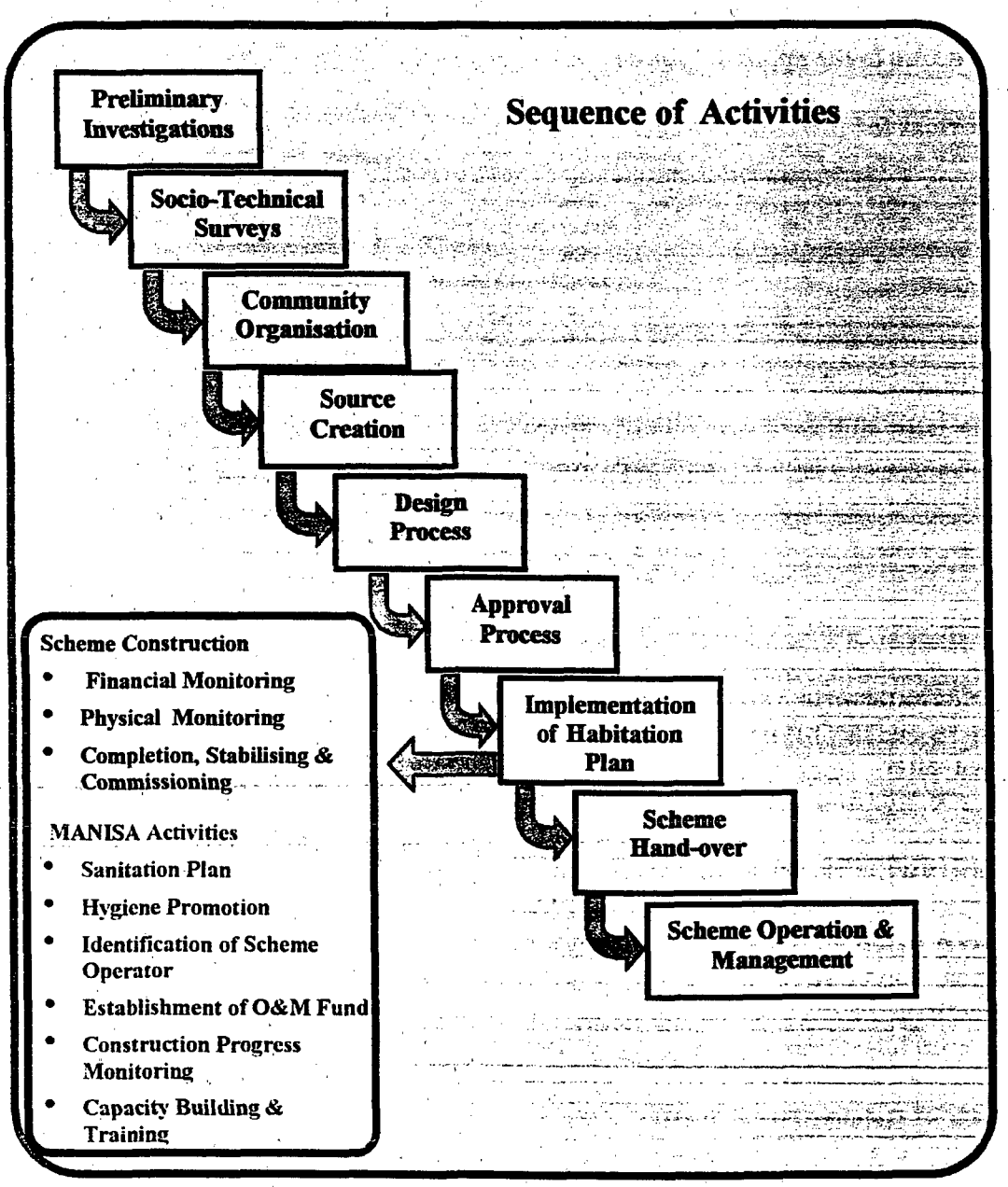
The next step in the approach was to obtain financial approvals from the Royal Netherlands Embassy based on Marginal Appraisals prepared by NAP Office with assistance of the SPU-PRED. The purpos
A Tripartite Agreement for a Habitation Plan
that all the processes involved in finalisir
community had in fact been followed. The major aspects covered in a Marginal Appraisal is described below:

1. Location & Demographic Features of the habitation
2. Duration of the Project
3. Budgets - Cost of Construction & Estimate of O&M cost
4. Description of Beneficiaries
5. Responsibilities - for construction
   - for O&M and its financing
   for internal and external monitoring of progress during construction
   for internal monitoring of O&M and reporting to PRED
6. Description of Water Management Committee
7. Hydrogeology – Source Details, Water Quality etc., Sustainability
8. Community Participation & Approval of Habitation Plans
9. Projected fund flow
10. Brief description of the Proposal
11. Technical Considerations & Lay out
12. Preliminary O&M and Sanitation Plans

Initially it was assumed that approval from RNE was automatic. However, there were instances where the RNE had withheld such approvals causing delays in the construction of schemes.

4.6.4 Tendering

On approval from the RNE of the Marginal Appraisals, the SPU-PRED initiated the tendering process as per PRED norms. NAPO requested PRED for copies of the tender conditions which were not made available. This had hindered the project as NAPO and the Community remained uninformed about the performance parameters set for the contractors, especially on aspects of testing, commissioning and certification of completion.



4.7 Implementation of the Habitation Plan

4.7.1 Scheme Construction

Construction of schemes was the responsibility of the SPU-PRED through their usual contracting procedures. Though originally intended, community participation in scheme construction was limited because of this. As a result, monitoring procedures had to be set up to follow only the physical and financial progress of the project.

Financial Reporting: A format for financial monitoring prepared by the SPU, PRED Vizianagaram and NAPO, was discussed with the EnC-PRED and approved. The structure of the approved format was as follows:

Format for Monthly Financial Reporting

A/c Code	A/c head	Descrip -ion	Budget	Total Expenses for 1998-99	Total Expenses for 1999-00	Total funds Utilised	Balance Budget Available	Expenses for the Month
(1)	(2)	(3)	(4)	(5)	(6)	(5)+(6)= (7)	(4)-(7)= (8)	(9)

The first report in the above format was completed up to 31 December 1999, thereafter followed by monthly reports in order to catch up with the backlog. A statement of monthly expenses was also to be submitted to the NAP Office in the following format:

A/c Code	A/c Head	Voucher No.	Date	Description	Amount Rs.

Reimbursement Proposal: The Project was financed with an initial imprest of Rs.10,00,000 (Rupees Ten lakhs) to the SPU-PRED and on a reimbursement basis thereafter.

The reimbursement claim consisted of the following components:

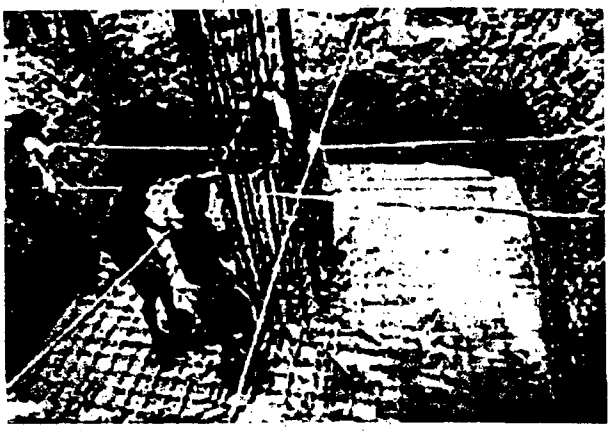
- Finance reports as mentioned in above;
- A reimbursement claim in the following format:

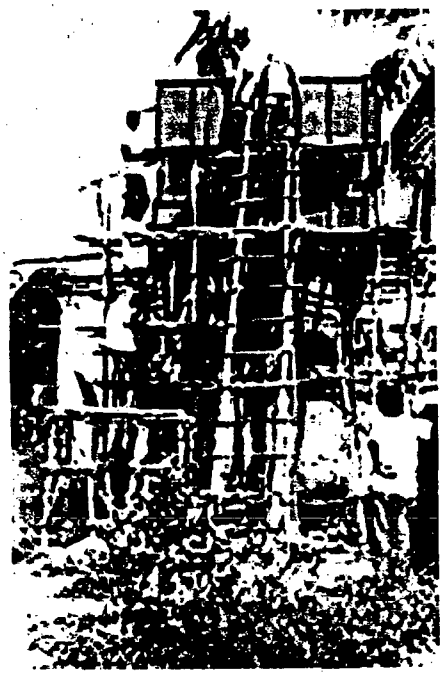
Total Expenses Incurred to-Date	(1)	Rs.
Amount Reimbursed to Date	(2)	
Balance due to PRED	(1) – (2) = (3)	
Add: Imparts Amount	(4)	
Total Claim/ Reimbursable	(3) + (4)	

Physical Monitoring: Physical progress reporting was at two levels. The format for reporting progress on construction of each phase of a scheme is attached in **Annexure 12: Progress Report**. At the level of physical monitoring of the entire project process and sequence, the basic format had the following features:

1. Individual habitation progress report.
2. Indicators for the report were C = Completed; N= Not Taken Up; and P = In Progress.

While milestones completed were to be followed by a report on the milestone in detail, activities in progress were to be reported in detail with an attachment to the main report.





Construction of an MLSR from foundation (top) to superstructure (right)

Completion, Stabilising & Commissioning: Prior to handover, the SPU-PRED had been requested to prepare a completion report. It was found that due to delays in preparation of reports, the physical process of stabilising and commissioning went ahead without preparation of completion reports. Eventually a financial completion report was formulated providing a summary of costs of each major component of each scheme. Technical completion reports were not prepared. An example of this report is attached as **Annexure 13: Completion Report.**

After handing over of a scheme to a habitation, it is proposed to conduct an independent Financial and Technical Audit, which will be described in the Project Completion Report.

Format for Physical Progress Reporting

Name of the Habitation: ..... **Mandal:** .....

Sl. No.	Milestone	Activity Component	Completed (C) / Not Completed (NC)	Remarks
1.	Preliminary Study	Attitudinal Assessment, Rough Demography, Societal Stratification		
		Identification of sub-habitations		
		Rough habitation & water source mapping, water sampling		
		Tentative investigation plan		
2.	Habitation Study	Social Mapping, Household Survey, Demographic Data Collection, Water needs Assessment		
		Civil survey of habitation and drainage		
		Water quality & quantity assessment, assessment of need for new sources.		
3.	MANISA Formation	Village meetings, establishment of MANISAs		
4.	Source Construction	Suitability of Existing Sources, Creation of New/Replacement Sources and their assessment		
5.	Draft Designing	Formulation of Design Criteria, Service area demarcation, confirmations of land access for water supply & drainage. Consensus on Draft design		
6.	Design Acceptance	Presentation of design to MANISA and to Gram Sabha. Community acceptance for O&M. Land access agreements		
7.	Design Finalisation	Finalisation of designs & costs.		
		Preparation of estimates. Preparation of Marginal Appraisal for RNE.		
		Tender notification, award of contracts		
8.	MANISA Activities	Sanitation Plan		
		Raising contributions		
9.	Construction of Scheme	Construction of Scheme Components, Monitoring of Progress		
10.	Training	Training of MANISA/ Community		
		Training of Operator		
11.	Handover of Schemes			

4.7.2 MANISA Activities

Implementation of the Sanitation Plan: The sanitation plan included several components that needed to be integrated. The hardware component of creating a concrete and earthen channel drainage system was designed to incorporate drainage of existing sources also. This provided the entire habitation with a comprehensive waste water disposal system.

The behavioural components included a number of activities. These were cleaning of facilities (tanks, stand posts and drains), handling of solid waste, and relocation of manure pits and defecation sites. Simultaneously, hygiene promotion campaigns were conducted to create an awareness about the relationship between water borne diseases and handling of water at the stand post, household and at the street-drainage level. By and large, every habitation followed its own sanitation plan. After completion of the schemes, the MANISAs are monitoring the environment around the water points, cleaning of the tanks and ensuring that safe practices of water handling are followed at the household level. School children, teachers and other volunteers have also been motivated to participate in this Program.

The strategies adopted by the MANISAs present an interesting variation. Some MANISAs spare a few hours a week to attend to sanitation issues in their habitations. In other habitations, which are large and where the drainage system is complex, MANISAs have mobilised funds to employ the services of a separate person to clean the drains. In a majority of the habitations, the members of the MANISA, with the assistance of a few volunteers are taking a much more direct role, fixing specific responsibility for specific tasks to individuals in the habitation. Efforts are also being made to bring sanitation-related issues into the mainstream of village activities by addressing them in specific village meetings such as monthly review meetings, where complaints are discussed and solutions evolved.

Hygiene Promotion: Across the habitations, improved practices related to the collection, storage and utilization of water are clearly evident. Vigilance at stand posts has resulted in communities having introduced systems and practices, controlling washing of clothes and cleaning of utensils. A major achievement for MANISAs has been a significant control and reduction in public and road side defecation. Communities have agreed to demarcate certain areas as defecation areas and have been quite successful in establishing this norm. Hence, the hygiene promotion activities have resulted in observable behavioural changes in most habitations.

Along with a motivation program at individual household level, efforts were made to mobilize existing Government programs for construction of household latrines in project habitations. Similarly, Government PHCs were contacted to regularise extension of health services to the habitations. Additionally, consultations were held with local NGOs to link up MANISAs and habitations to their development programs.

Identification of Scheme Operator: In orientation programs and subsequent meetings, where responsibilities of MANISAs were discussed, it was explained that MANISAs would be responsible for selection of Piped Water Supply Scheme Operators and hand pump Mechanics, based on certain criteria. The MANISAs in

turn sought recommendations from the communities for likely candidates, who were then approved in a joint meeting of the MANISA and project staff. Generally, two people were identified from each habitation, one as a potential candidate and the second as a standby candidate. The selected candidates were later given training in their respective functions. All the schemes that have been handed over are now being operated by these trained Operators and Mechanics.

The desirable criteria for an Operator were: a minimum level of literacy - ability to read and write, a mechanical aptitude, good physical ability and lastly, a sense of responsibility.

Establishment of O&M Fund: Against a long history of the Government providing RWS services free of charge to user communities, the introduction of responsibility for management and payment by users for O&M was a difficult issue. The Initiation Phase experimented with the establishment of a financial buffer with the creation of an O&M fund during the construction phase of schemes. In each habitation this fund had a target of raising one year's estimated O&M cost prior to Handover of the scheme.

The estimates of the O&M costs in each habitation were experimental since detailed information in this regard was not available. On the one hand, earlier experience indicated that actual costs were composed of the salary of the Operator, repairs to pumps and other minor repair. In future, additional costs could be expected since smaller habitations are presently exempted from paying electricity charges. Another consideration is that the O&M fund may have to provide for part of the replacement cost of the scheme in the long term.

AEE (right & EE (left), SPU-PRED in O&M Fund mobilisation drive

The Initiation Phase ultimately chose to estimate the annual O&M cost at 1% of the capital investment, a lumpsum provision for pump repairs and the Operator's salary.

All MANISAs have taken over the responsibility of collection and management of the O&M funds. Some MANISAs were handling minor repairs and payment of the Operator's salary prior to formal Handover of schemes.

Initially, each MANISA adopted different collection procedures. Some had books maintained by the concerned street member who made the collections, while others collected amounts by the issue of receipts. A few of the MANISAs tried fund raising by declaring a particular day as the collection day, while others had their respective members pay up the money in advance making them personally responsible for individual household collections. Some MANISAs used cards with names of members printed on them to record household level collections by each member.

All the above approaches were made uniform with the printing of receipt books by the project as a one-time input to MANISAs. This was expected to streamline collections and make its assessment easier. MANISAs were also given account books for writing accounts along with training on basic book keeping and accounting.

Funds collected by MANISAs for the purpose of O&M have been deposited in separate accounts in respective post offices. These accounts are operated by the President and Secretary of each MANISA as joint signatories.

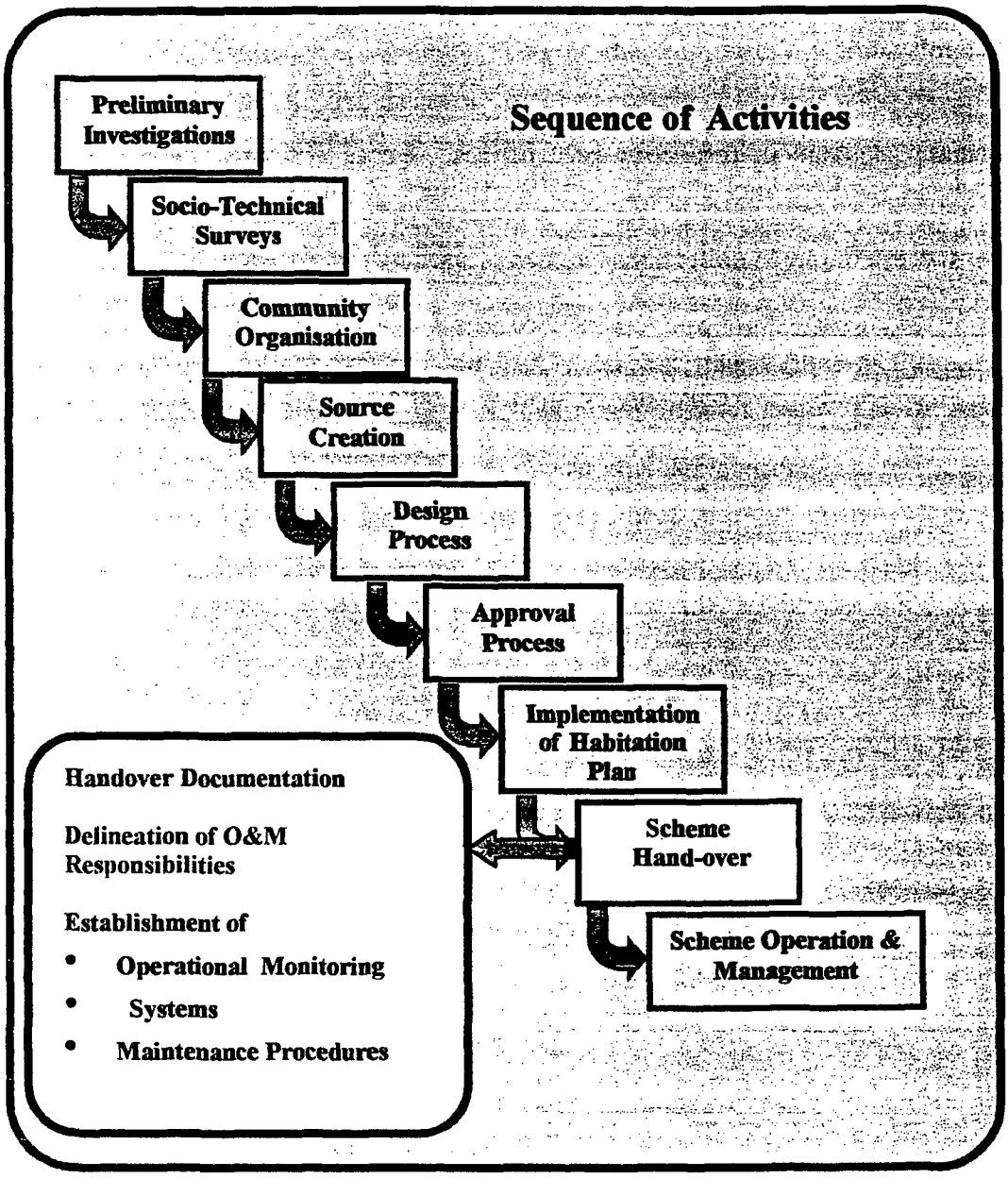
The success of O&M collections can be assessed by two parameters:

1. The establishment of a regular system of monthly payments: Up to November 2000, fund raising for O&M had not met expectations in most habitations. Thereafter, the collection system was rationalised and the monthly collection regularity has improved from about 55% to about 80% of the households, across the project habitations.

2. The percentage of one year's O&M fund paid at the point of scheme handover: The percentage of payment towards one year's O&M budget averaged 64% in Jami Mandal at the time of handover and 47% in Gantyada, with an overall average of 56%.

Construction Progress Monitoring: Initially it was envisaged that communities would actively participate in the construction process with direct roles to play in procurement of locally available items and provision of skilled and unskilled labour components. However, since all schemes were constructed under standard PRED contracting conditions, this aspect of community involvement was extremely limited.

Capacity Building: Activities related to capacity building of MANISAs have been discussed in Chapter 7.



4.8 Scheme Handover

4.8.1 Handover Documentation

For PWS schemes, a detailed Handover Document was prepared. This contained:

- A basic data sheet or fact sheet for the scheme, stating its basic design features and costs.

- A civil survey map indicating locations of all valves, nodes, layout of pumping and distribution lines, locations of MLSR and Stand posts. Each stretch of pipe line will be numerically codified and technically described in a separate data-base.
- A completion report, detailing completion of all technical aspects, as per original/ revised provisions of the design/ contract, should be provided by the PRED.
- A social map showing layout of the households of the habitation, duly numbered, showing service areas under each MLSR and Stand post and accompanied by a data base providing details of the information collected during the Household Survey.
- Technical data on source investigation, construction and evaluation, i.e. hydrogeological investigation report, yield and water quality test reports.
- An O&M Manual, specifying detailed operation, maintenance, monitoring and management procedures, their frequencies, and location of responsibilities. Formats for Log Books for routine records and Job Cards for maintenance will also be included in the Manual. The O&M Manual will be prepared progressively, after due consultations with PRED and MANISAs.
- Definition of Duties & Responsibilities of Operators, maintenance functionaries, MANISAs and the SPU-PRED.
- An agreement with the community represented by the MANISA for acceptance and management of the scheme.

Activities prior to Handover of PWS Schemes:

- Preparation of "As-laid Maps" along with field orientation of Operators and MANISA members.
- Completion Certificate, prepared on the basis of main features of the initial scheme design and tender specifications, in the absence of a standard Completion Certificate format.
- Preparation of all aspects of handover by the SPU, including the reassessment of the need for technical orientation and training of MANISA members and Operators.
- Preparation of Operation & Management Manuals.
- SPU to supervise the work of operators and operations of schemes till the completion of handover.

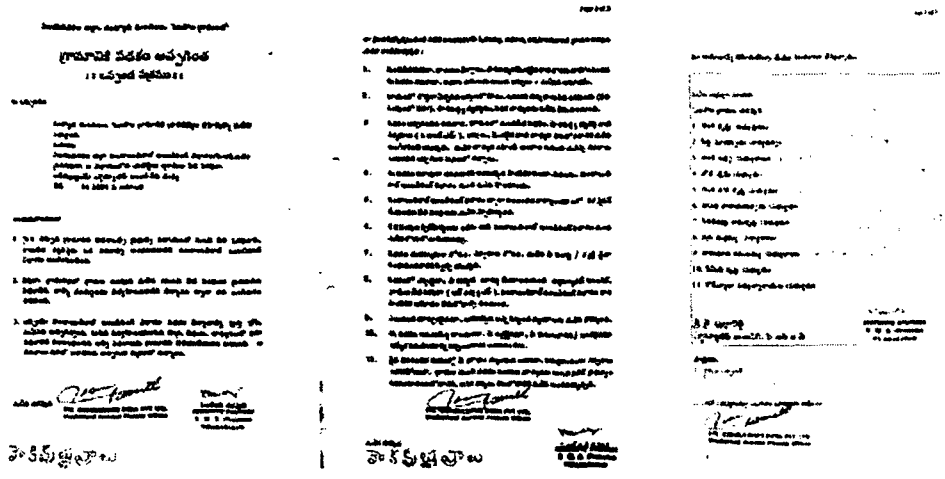
Handover documents have been prepared for 11 Piped Water Supply Schemes and 12 Hand Pumps. The contents of these documents are:

1. Handover Resolution
2. Village Profile
3. Social Map
4. Introduction
5. The Water Management Committee - MANISA
6. Description of the Water Supply Scheme
7. Cost of Scheme & O&M Costs

with annexures containing:

1. Agreement & Resolutions for Design, O & M and Land Access
2. MANISA - Record keeping Needs & Formats, Bio-data of Operator
3. Technical Details of the RWS System - As-Laid Map, Water Quality Data, Drilling & Lithologs
4. O & M of Schemes - Technical Functions
5. Record keeping Needs for O&M of PWS Schemes, List of Tools
6. Household Data of the Habitation

As mentioned earlier, technical completion reports were not available for any scheme.



A Handover Resolution

4.8.2 Delineation of O&M Responsibilities

Delineation of O & M responsibilities were formulated as an integral part of the Handover documentation. The detailed description of responsibilities at each level is provided in **Annexure 15: O & M Responsibilities.**

4.8.3 Operational Monitoring Systems & Maintenance Procedures

In the absence of Technical Completion certification from the implementing agency, the benchmarking of scheme performance was established through the calibration of each scheme prior to handover. Calibration of schemes was carried out by external consultants to establish the yield of source wells, measure filling rates of reservoirs (thus estimating system losses in the Pumping Main Line), calibrate inlet valves to reservoirs (to establish uniformity in filling times of multiple reservoir systems) and measure discharge at outlet points. Guidelines for Calibration of Schemes used for this exercise are attached in **Annexure 16: Guidelines for Calibration of PWS Schemes.**

The calibration of each scheme also served to orient each operator with the specific operational characteristics of their respective schemes and to establish regular log book recording procedures for scheme performance recording.

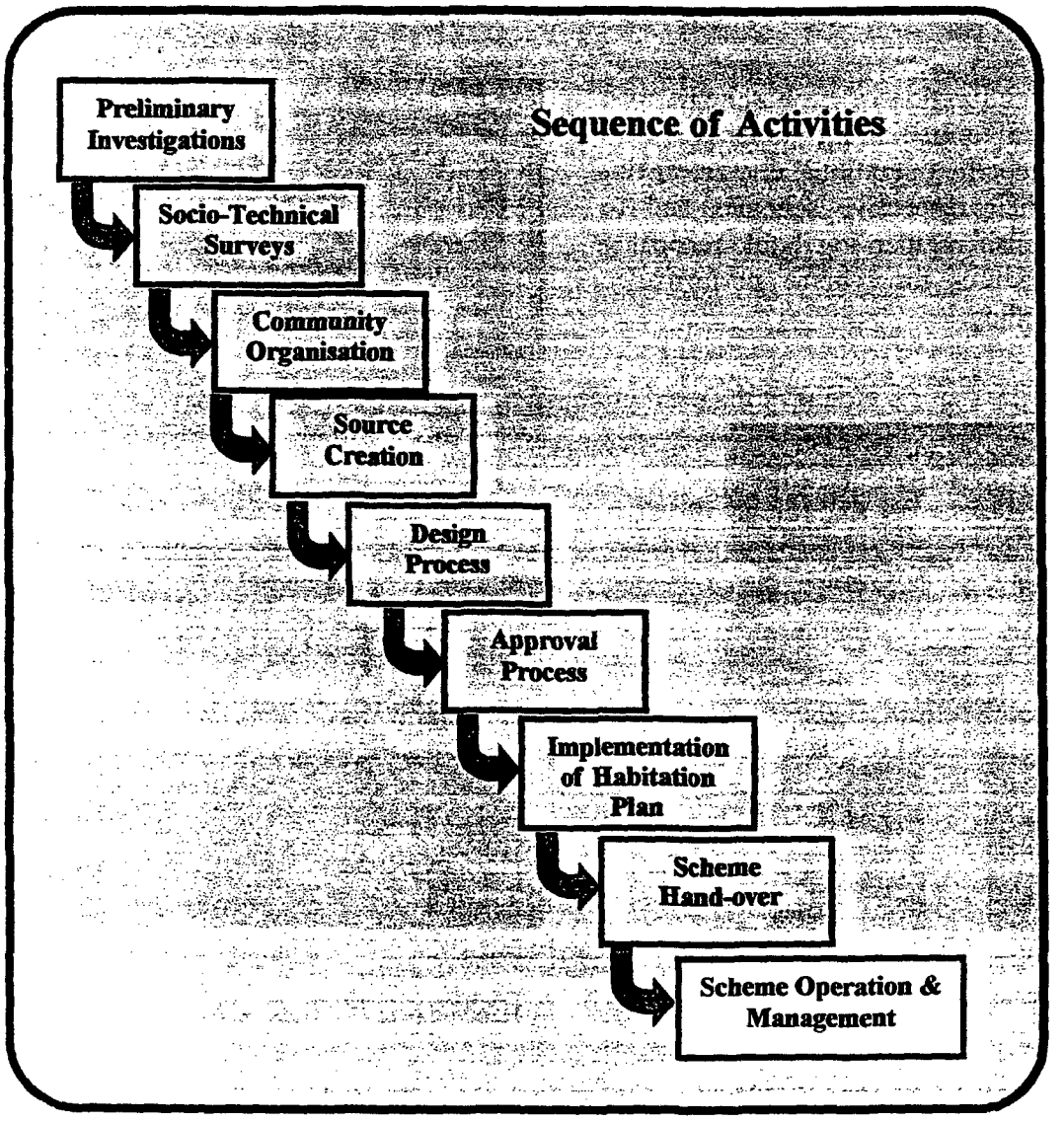
Calibration of Source Well at Pushpagiri

Scheme inauguration at Pensam in the presence of the District Collector

Handing over of Scheme at Korlam by EE-SPU

The schedule of Handover of schemes is provided below:

Mandal	Gram Panchayat	Habitation	Date
Jami	Anamrajapeta	Anamrajapeta	12 April 2001
		Jaggaipeta	
		Seethanagaram	
		Pushpagiri	
		Harijanwada	
Gantyada	Chandrampeta	Chandrampeta	27 June 2001
	Chinna Manapuram	Chinna Manapuram	25 June 2001
	Madhupada	Chinna Madhupada	27 June 2001
	Ginjeru	Ginjeru	Not handed over
	Korlam	Korlam	27 June 2001
	Madhupada	Pedda Madhupada	27 June 2001
	Pensam	Pensam	27 June 2001
	Tathipudi	Tathipudi	27 June 2001



4.9 Scheme Operation & Management

The AP III Project has reached this stage of its Sequence of Activities for all its water supply schemes constructed in Vizianagaram by June 30, 2001. While the conceptual framework for this stage of the Project, i.e. Scheme Operation & Maintenance, has been formulated, experience with its application has not yet been gained.

Once schemes have been handed over to MANISAs, they are free to approach any individual or organisation, including PRED, for maintenance services of any kind. Hence, a clear distinction of responsibilities was not very essential, since the MANISAs were also free to choose their source of professional services for maintenance. However, the MANISAs need to consider the fact that the PRED would be able to provide least-cost service options to the MANISAs.

The operational aspect of O&M will rest mainly with the Scheme Operator, under the supervision of the MANISA. Hence, the management aspect of schemes will have to be more intense since both operation and management will need attention of the MANISA. A system for recording operational data has been introduced and will evolve further with usage.

The transfer of maintenance responsibilities has to be gradual with PRED providing buffer for a smooth transition.

Basic data for schemes has been placed on record in the handover document. Competence of Operators has been increased through in-service training activities. Operational procedures and preventive maintenance routines have also been set out. This period has also familiarised MANISAs with the managerial responsibilities of schemes.

MANISA members and Operators taking charge of maintenance tool kits

SPU-PRED will have a crucial role in consolidation of the operation and management system. They will act as the resource person for the MANISAs and will need to convene periodical (monthly) meetings to review the performance of Operators, take stock of the maintenance situation, replenish spare parts, check maintenance records and gradually prepare MANISAs to undertake these functions by themselves.

The changes that have occurred in the original 4 year Program planning have had some consequences in the follow-up of the O&M system. The original project duration would have provided the opportunity to continue post-handover assistance and monitoring of schemes completed during the Initiation Phase, while implementing the Expansion Phase. With the decision to consider these two phases as separate entities, the Initiation Phase had to be closed in all respects and no follow-up can be provided under these circumstances.

5. Project Management Process

5.1 Institutional Framework

Since the AP III project in Vizianagaram was expected to develop and test an alternative approach to rural water supply and sanitation in Vizianagaram, it implied that the project would seek to change existing implementing methodologies. Consequently, resistance to the changes that the project approach would bring about, was an inherent assumption.

To succeed in finding the alternative approach, the project would need a sensitive implementing agency which was not just amenable to change but which also wholeheartedly believed in it and supported the process entirely. Hence, the successful implementation of this project implied that its leadership at all levels believed in the need for change, i.e., the need to depart from existing standard procedures for implementation of RWSS programs.

In the AP III project the above assumptions were partly correct.

The upper echelons of the implementing agency, PRED, appeared to subscribe to the need for developing an alternative implementing methodology that was more amenable to listen to user opinion and more attuned to meet user needs. However, the commitment of this level of PRED varied in consistency.

At lower levels, the variations were much more pronounced. It changed as individuals and position in the organisational hierarchy changed. At the field level the acceptance of the need for a new approach was less understood and was often perceived as undesirable departure from established norms of physical implementation and accountability. Transparency, sensitivity to users' opinions, efforts at systematising planning and reporting were often perceived as threats.

Yet it has to be recorded that substantial headway was made in instituting changes and these have been discussed later.

The project proposal had outlined the need for a two-tiered institutional configuration for the project. A Special Project Unit (SPU) at PRED headquarters would act like a policy centre, to supervise and coordinate the conceptualization of new approaches and their implementation in the field, and to analyse the results with a view towards future application in the RWSS sector in AP. This group was envisaged as the strategic body for the project's implementation.

A second SPU at the field level, SPU - Vizianagaram, would be responsible for implementing policies and methodologies formulated by the SPU at headquarters and report back to the strategic unit on the experiences obtained during implementation and the lessons that could be learnt for the future.

5.1.1 Special Project Unit at Headquarters

The SPU-HQ would be headed by an externally recruited professional manager, supported by engineering inputs from PRED and externally engaged social organisation staffing. It would report to a State-level Steering Committee through the Engineer-in-Chief of PRED.

In actual practice, SPU-Hyderabad was not established and the project responsibility went by default to the Chief Engineer-RWS. Consequently, the State-level Steering Committee was also not established.

Initially the project held the attention of the EnC for a while but it was not feasible to expect this concern to be sustained over a long period of time from the highest executive of the PRED. Gradually, responsibility for the project was delegated to the Chief Engineer, who in turn was dependent on the Superintending Engineer at District level for follow-up actions. Though these officers of the PRED were senior officials in their own right, they did not necessarily subscribe to the need for an alternative approach, partly because they did not participate in the project formulation process and partly because of the fundamental attributes of a large organisation – inflexibility and adherence to rules and precedents, rather than innovativeness and creativity.

A second reason why the SPU at Hyderabad was not constituted was probably because the project remained physically and financially small, and did not provide sufficient inertia to influence broad-based changes.

5.1.2 Special Project Unit – Vizianagaram

The field level SPU at Vizianagaram was created as soon as the project started operations in Vizianagaram. It was headed by a PRED Executive Engineer, supported by a PRED Hydrogeologist, two regular PRED Sub-Divisions, each with a Deputy Executive Engineer in charge of four Assistant Executive Engineers. Social Development professionals were to be externally recruited and NGOs were to be contracted for field level community organisation activities. Lastly, PRED was expected to provide the necessary administrative staff of a regular Division under an EE. This SPU would be responsible for implementing policies and methodologies formulated by the SPU at headquarters and was made responsible to a district-level Steering Committee.

The District Steering Committee was to be headed by the District Collector as its Chairman; the Superintendent Engineer, RWS PRED, as the Convener; and the Zilla Parishad Chairman, Joint Director State Ground Water Board (SGWB), District Medical & Health Officer, Supdt. Engineer -AP State Electricity Board (APSEB), and Team Leader, NAPO as its members.

At the district level, the sensitivity of the leadership and their perceptions about the project varied widely with the individuals assigned these tasks. The fact that these individuals changed frequently and generally came with little orientation to the project's objectives, did not make matters simpler. It made the Steering Committee and the SPU prone to individual preferences and styles of functioning on the one

hand, a tendency to look for direction and approval from Hyderabad at every step on the other hand, rather than proceeding according to a predetermined organisational direction consistent with the project's objectives. In fact, as a result of such factors, the Steering Committee could not actually be convened for the first year of the project, since efforts to appraise its Chairman about the project failed initially.

While periodical progress of the project was discussed, the agenda was generally limited to reviewing the implementation aspects of the project, since most policy level decisions were to be taken at the headquarters level. However, the lack of an SPU at Hyderabad resulted in the absence of a focal point, which could address issues regarding policy positions. Consequently decisions could not be arrived at on issues such as handing over of existing sources including hand pumps to the community, obtaining power supply to the sources and providing a legal status to MANISAs.

During the two and a half years in Vizianagaram, the project had three different Chairmen of the Steering Committee, three Superintending Engineers and four Executive Engineers responsible at different levels of the project's management. Among other effects, this had obvious impact on the continuity and momentum of project.

Eventually the District Collector, at Steering Committee meetings, did facilitate and approve decisions on the handover of completed water supply schemes, improving collection of O&M funds through intensive community interaction, and through intervention, to resolve matter such as expediting power supply to water supply schemes constructed under the project. However, other important issues remained unresolved, such as the lack of a clear position on the legal status of MANISAs.

The Field SPU's progress in the initial stages was at a slow pace, but improved later. PRED experienced some difficulties in filling in the externally recruited positions in the SPU due to:

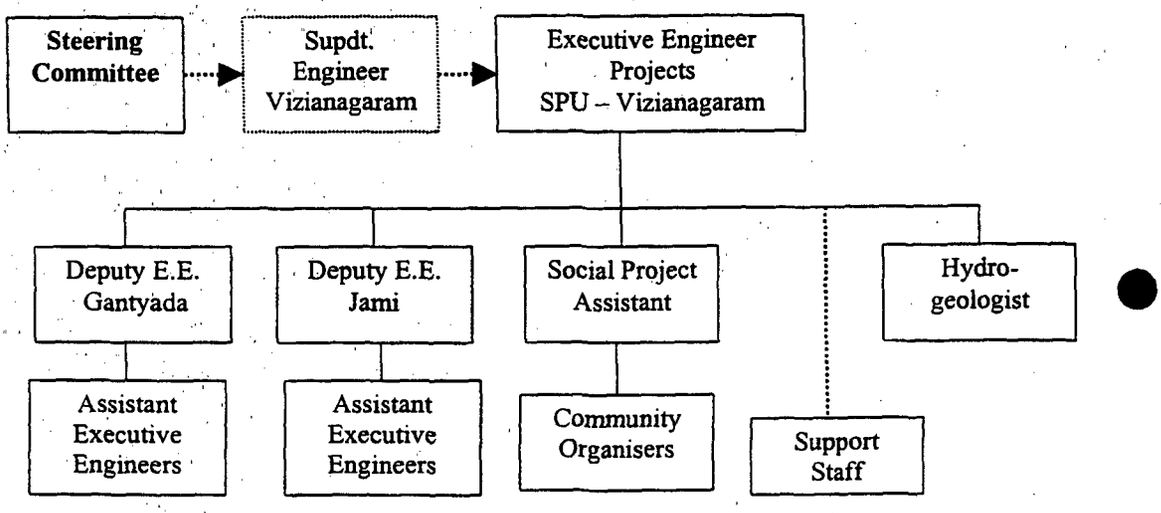
1. Limitations imposed by GoAP on hiring staff for the department.
2. Limitations on hiring staff with expertise other than engineering.
3. The limited size (in 24 habitations) of the project made it difficult to justify employment of full time dedicated professionals.

To overcome these limitations, the positions of the Senior Sociologist and the Social Project Officer were amalgamated into the position of the Social Project Assistant (SPA). The SPA was initially appointed by the NAP Office for a period of 12 months and deputed to the SPU Vizianagaram. Eventually the SPA was directly appointed by PRED. Community Organizers were recruited from project habitations as the first level of community contact. The SPA and eight Community Organizers allowed the incorporation of community participation into the mainstream project activities. Similarly, the appointment of a geologist from PRED ensured that source investigations and construction was a precondition to formulation of scheme designs.

Several workshops and training programs were conducted by NAP Office to orient the SPU Field Unit in implementation of the above techniques, and were conducive to creating an understanding for joint responsibility and teamwork. The SPU Field Unit

was thus enabled to interact with the community on drafting scheme designs sensitive to community needs based upon realistic design criteria.

The organisation chart of the Special Project Unit – Vizianagaram and its relationship to the District-level Steering Committees is as follows:



5.2 Institutional Lessons

At an early stage of the project, reporting and monitoring procedures for measuring overall project progress in physical, financial and qualitative terms were determined in consultation with PRED at headquarters.

While time frames were set for accomplishment of various aspects of the project, this time planning was not so rigid because of the project's experimental nature. The major constraints which the project faced are as follows and could be treated as lessons for the future:

Leadership: Finding a suitable EE, who had an appreciation of multidisciplinary approaches, to head the SPU Vizianagaram was not possible almost until the end of the project. In the life span of the project (Aug 98 - Jun 01) the leadership of the SPU changed four times, of which the first three did not contribute significantly to the development of the project organisation. This resulted in a lack of direction towards project implementation and caused inordinate delays.

Availability of Inputs: The success of the project was largely dependent on the timely availability of inputs. Though the project started in Vizianagaram in August 1998, funds for the project were not available till January 2000. Establishment of sustainable water sources through hydrogeological investigations and subsequent source construction were preconditions to designing of schemes. Inordinate delays

were experienced in availability of drilling rigs from the implementing agency for construction of sources. Such delays caused a loss in the momentum of interest generated in the community towards participation in the entire project implementation process.

Similar delays were faced at other stages of the project. The question of power connections to completed sources is one such example where applications for power connections were made at a very late stage and norms for obtaining power were never clearly stated. It required a high level of intervention from the district authorities to resolve this issue and delayed commissioning of some schemes for up to six months.

Hydrogeology: Hydrogeological investigations were one of the early level activities necessary to establish sustainable sources prior to the initiation of scheme designs. Hence, strengthening the hydrogeological capabilities of PRED and assistance in coordinating the available data from and with related institutions such as the Central and State Ground Water Boards (CGWB, SGWB), the Irrigation Department, the Agriculture Department, the AP State Remote Sensing Agency (APSRSAC), the National Remote Sensing Agency (NRSA) and other data analysis was found necessary.

Data on water quality and drinking water wells in the project area was collected, as well as lithologs, pumping tests and updates of the structural and hydrogeo-morphological maps, based on the most recent high resolution satellite images and areola photographs.

However, the project could not find a suitable full time geologist and other personnel who could be trained, keeping the long-term project needs in consideration. In this case the relatively smaller size of the project acted as a deterrent to allocating full time personnel.

Water Quality Testing facilities: At an early stage of the project it became apparent that assurance of water quality would be an important factor in assuring sustainability of water sources. The water quality analytical facilities at PRED Vizianagaram were rudimentary. Facilities at Visakhapatnam were assessed and found inadequate and transporting water samples to the PRED laboratory at Hyderabad was not a viable alternative in the long run. Under these circumstances the construction of a Water Quality Monitoring Laboratory under PRED Vizianagaram became an integral part of the project.

The construction of this laboratory started at an early stage of activities in Vizianagaram and was satisfactorily completed by mid-2000. Subsequently an assessment by an external consultant resulted in the need for certain additions and alterations to equip the Laboratory for proper bacteriological testing capabilities also. These modifications were completed.

The staffing of the Laboratory was arranged by PRED through contracted technicians since employment of full time staff is not possible (as mentioned earlier), though this had been initially intended. Hence, upgradation of skills through training programmes has not been possible.

5.3 Role of NAPO Technical Assistance

The Netherlands Assisted Projects Office was established in 1993 to provide technical assistance to projects and to act in occasions on behalf of RNE.

The provision of technical assistance included the following main tasks:

1. Advise the Department of Rural Development, PRED and RNE on the results of the project, on measures taken to improve the quality of the approach;
2. Review the development of the respective schemes and discuss with the implementing agencies changes in the objectives and strategies that may arise;
3. Act as an agent in the exchange of information on the project, with RNE and with projects in India that are active in rural water supply;
4. Assist with the implementation of hydro-geological surveys and investigations and with the introduction of innovative methodologies; enhance the existing capacity in this field;
5. Provide also in other fields new ideas and stimulate discussions on technology, strategies and operational approaches;
6. Assist the SPU with the annual planning, physically and financially, and by proposing new approaches and methodologies;
7. Provide and co-ordinate assistance in management expertise at field level and head office level.
8. Overall monitoring and reporting to the Principal Secretary, Department of Rural Development and RNE.
9. Disbursement of investment funds to SPU- PRED for the project.
10. Administration and reporting on Investment funds

NAP Office would maintain a cordial relationship with the SPU, and act with them as one team in most occasions.

The NAP Office staff consisted of the following positions:

- Team Leader (expatriate)
- Hydro-geologist (expatriate, with inputs gradually phased out)
- Technical Programme Coordinator
- Programme Management Advisor
- Social Programme Coordinator
- Office Manager
- Technical Programme Officer
- Social Programme Officers
- Support staff

However, in the absence of a SPU at the headquarters, NAPO played the roles of:

- The technical advisor to SPU-PRED
- The agency responsible for monitoring the project
- Act on behalf of RNE to give clearances at different stages of the project.

SPU Vizianagaram saw their role only as physical implementers of the project and therefore preferred NAP Office not to participate in their day-to-day activities. The Engineer in Chief of PRED felt that NAP Office should provide a learning model for the SPU and this worked effectively in Jami Mandal to ensure systematic planning and active community participation. However, after this initial phase of knowledge sharing between NAP Office and the SPU, where both the groups worked closely, it was felt that the SPU needed to have more 'autonomy' in order to arrive at their own decisions. As a consequence of this, the SPU reverted back to its standard procedures of designing and finalising schemes in Gantyada Mandal, without putting much emphasis on planning and community consultations.

NAP Office, however, focused on acting as one team and participated in the process of preparation and implementation of the project with the SPU, on a regular basis. This greatly enhanced NAP Office's ability to draw lessons from the process and document them.

5.4 Institutional Accomplishments

The AP III project approach has been able to bring about significant changes in the institutional delivery mechanism of rural water supply and sanitation in the course of its implementation. The important landmarks in this process are listed below.

Social

- Establishment of a Social Wing in the SPU with professional staffing supported by community based functionaries.
- Sensitising the field level engineering staff towards community needs and approaches.
- Presentation of Scheme designs, costs, O&M budgets and other information to communities and obtaining their approval, thus making the project more transparent and "Demand Driven".
- Establishment of MANISAs as representatives of user communities, with full social sanction (in the absence of a legal framework) of communities, the reorganisation of MANISAs two years after their establishment, formation of Apex Bodies or federations of MANISAs in each of the two Mandals.
- Establishing the Operation & Maintenance Fund by each MANISA, while schemes were under construction, among other responsibilities related to water supply and sanitation,
- Preparing MANISA to take over management of completed schemes and actually doing so at the end of the project period.

Technical

- Inventorying all existing drinking water sources in a habitation for both quality and quantity, to assess their suitability for future use.
- Detailed habitation level surveying and mapping, using both conventional and computerised data processing, for generation of technical information to base scheme designs.
- Conducting detailed hydrogeological investigations to locate all new water sources.
- Using methodologies like, water needs assessments, formulation of realistic scheme design criteria, confirmation of source sustainability as a precondition to design, social and technical survey maps for basing scheme designs, rejuvenation of existing sources, comprehensive waste water disposal plans as integral processes in scheme formulation.
- Using "non-standard" designs to suit the community requirements thus making them location specific, such as decentralising water supply through multiple MLSRs, giving neighbourhoods, within a habitation, autonomy over their water.
- Establishing scheme performance benchmarking prior to handover to communities through calibration of schemes.

Managerial

- Establishing milestones for measuring project progress in summary.
- Establishing comprehensive preconstructional documentation procedure through Marginal Appraisals.
- Monthly financial reporting with comparison of actual expenses against budgets.
- Monthly progress reporting against milestones for social and technical progress for each scheme/ habitation.
- Regular review and analysis of time schedules and their rescheduling.
- Providing financial reports on completion of construction of the schemes.
- Completion of schemes well within budgeted costs.
- Compilation of the Handover Document, a comprehensive bi-lingual (Telugu and English) document on all aspects of a scheme, separately for each scheme, and providing these documents to respective MANISAs.
- Completion of external financial audit of SPU-PRED accounts for all project activities at Vizianagaram within 3 months after handover of schemes to user communities.

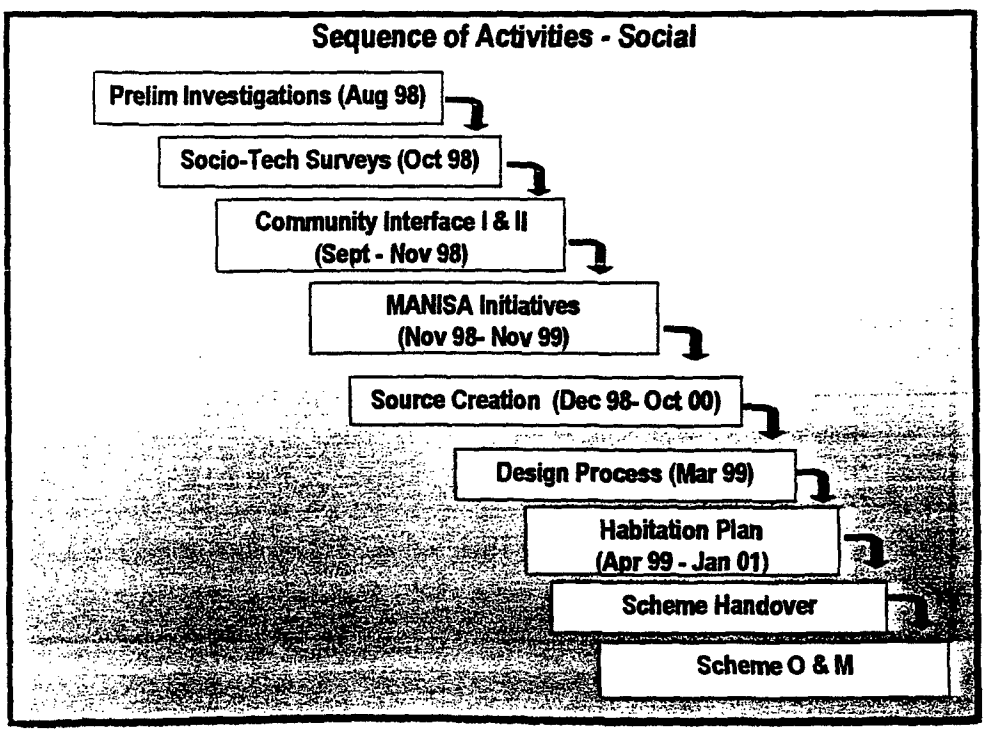
6. The Social Processes: Community Organisation

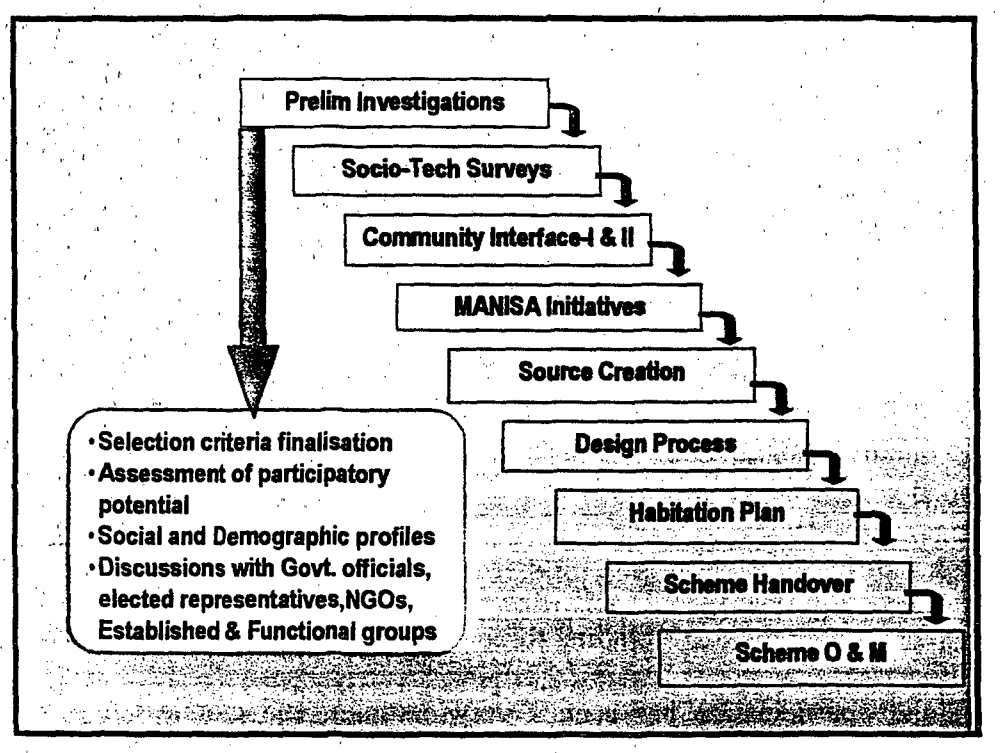
The AP III project intended to address the underlying principle of participation -*to give voice to people*. It also intended to address issues related to sharing of resources and benefits, influencing decision making, redistribution of power and control and acquisition of skills and knowledge to discharge these functions, specifically in relation to drinking water supply and sanitation related issues in the rural context.

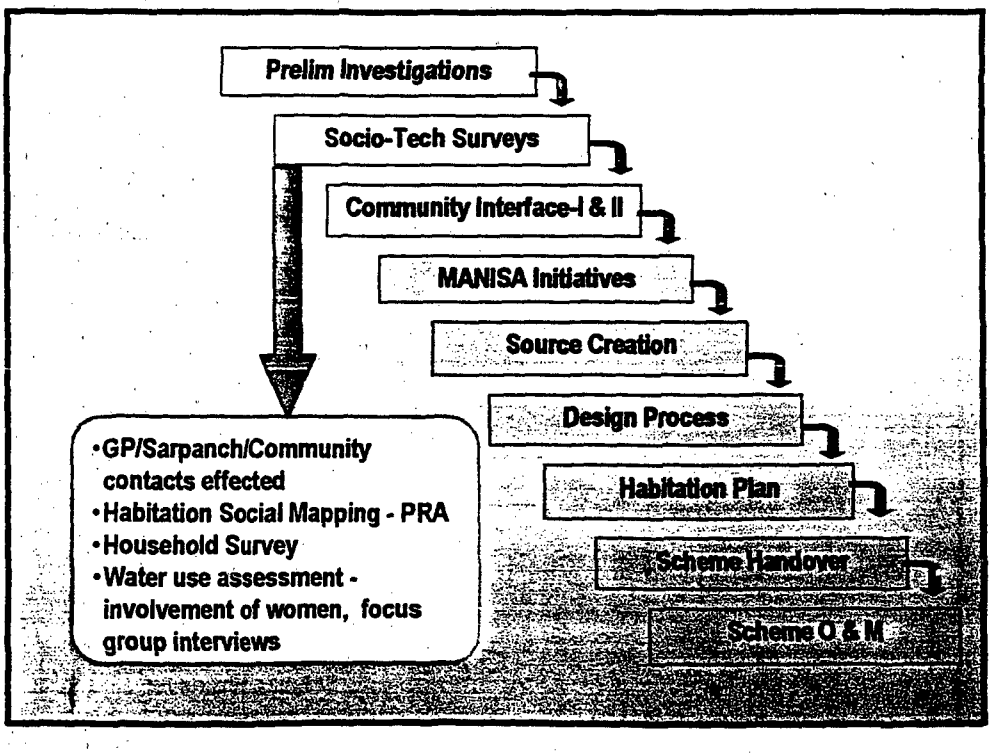
In the earlier Sequence of Activities, community organisation has been treated as one of the activities and as a milestone. However, the social processes that brought about this organisation and mobilisation was not a one-time effort but was actually a consistent and continuous effort throughout the project cycle.

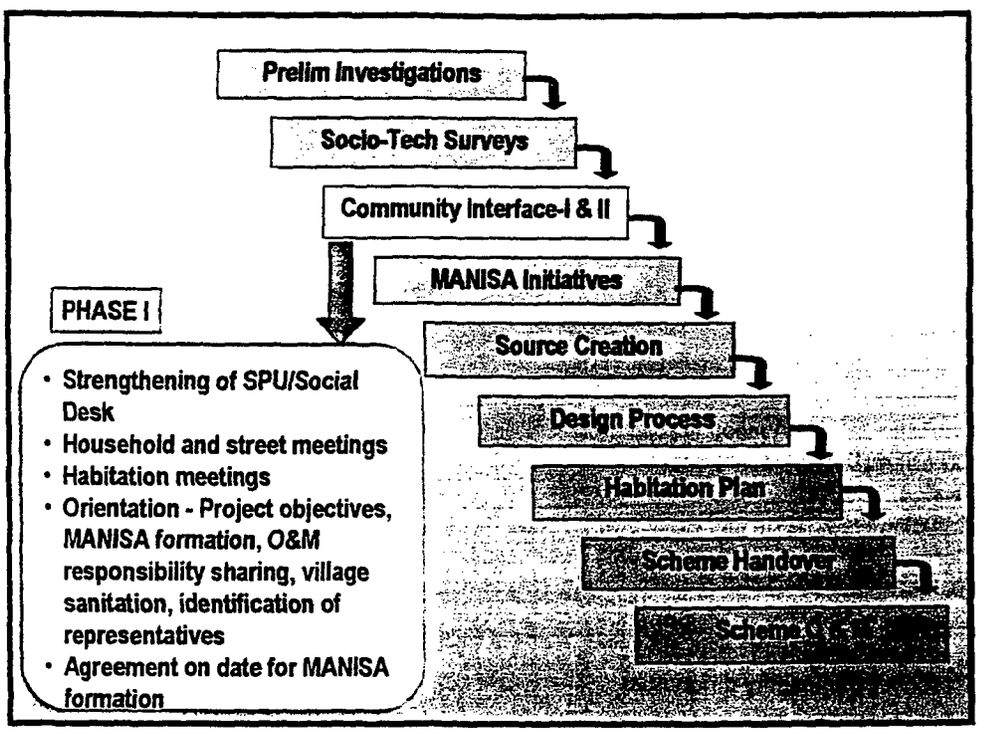
The community mobilization process was initiated on the premise that inputs could be provided at specific defined intervals and an effort would be made to try and control the outcomes. However, once process was initiated, its components often took divergent paths and significantly influenced other project components, like technical, institutional and managerial activities. At the same time the mobilisation also strengthened and provided a binding force to the entire fabric of the project.

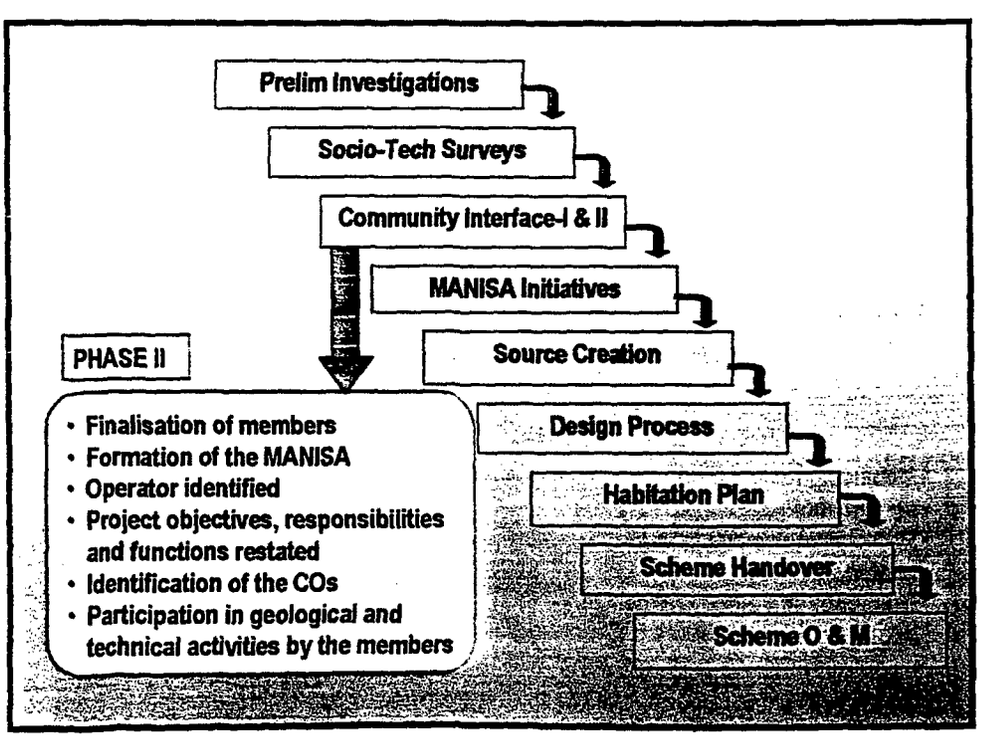
Community participation has been a very complex and crucial component in the approach and warrants a separate presentation in the sequencing of sub-activities. Hence, in the flow charts that follow, the Sequence of Activities-Social is no different from the earlier Sequence. Subsequent charts show sub-activities that have reference to community participation only. These sub-activities have not been discussed any further since some of these have been discussed earlier. The intention of the flow charts is only to illustrate the fact that social activities are a common thread in the overall scheme of activities in such a project.

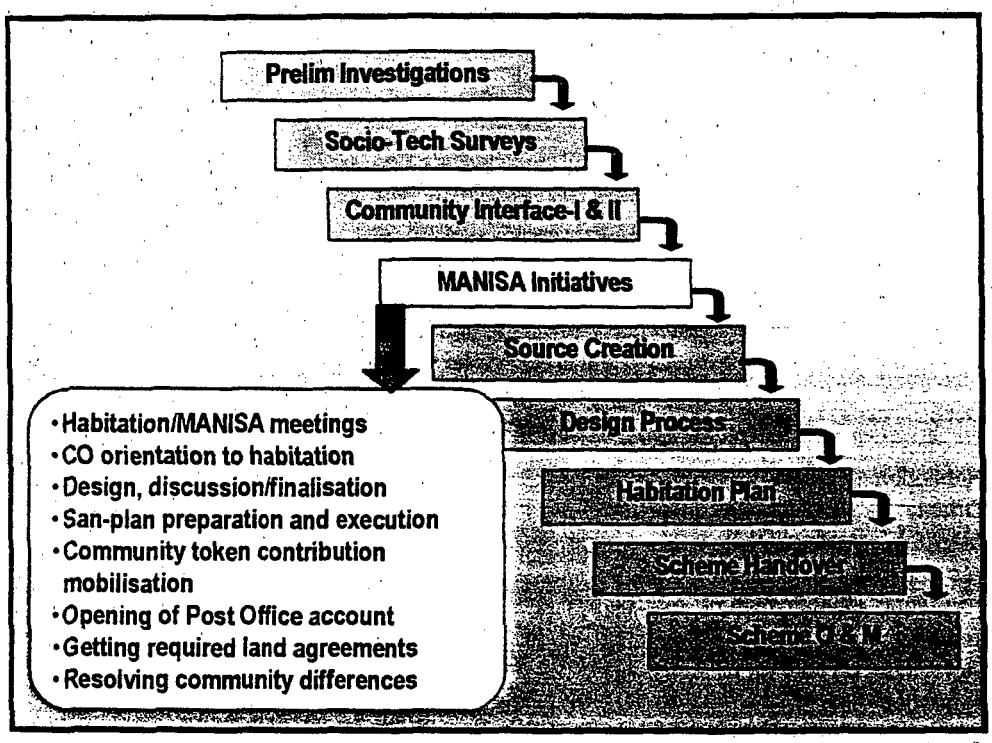


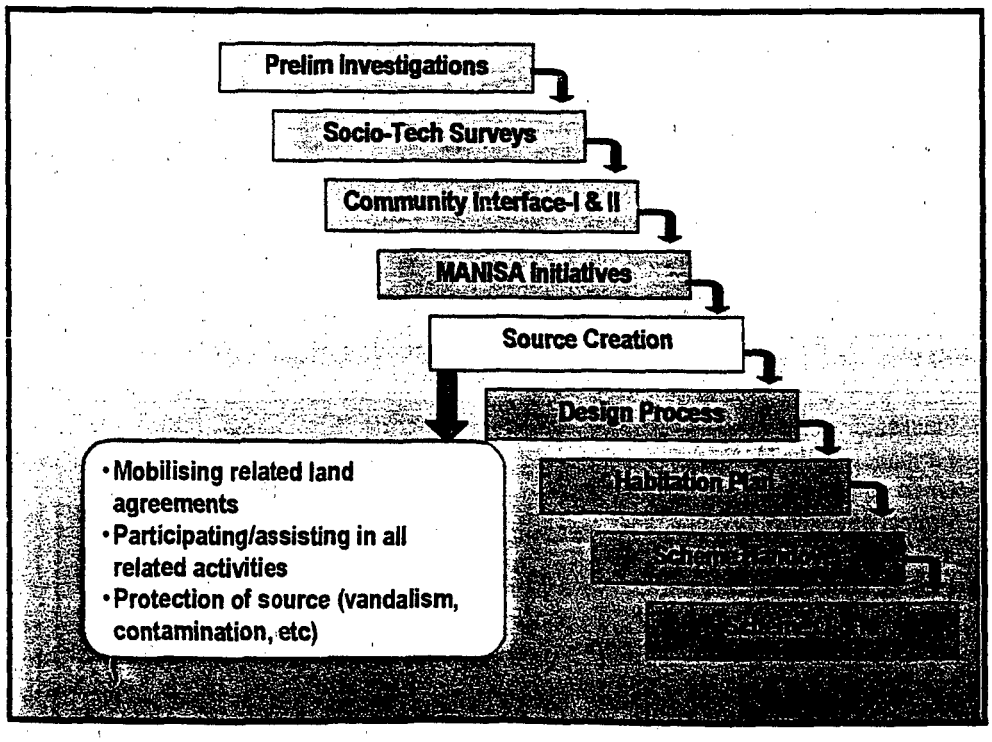

Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
Scheme O & M
•Selection criteria finalisation
•Assessment of participatory potential
•Social and Demographic profiles
•Discussions with Govt. officials, elected representatives,NGOs, Established & Functional groups

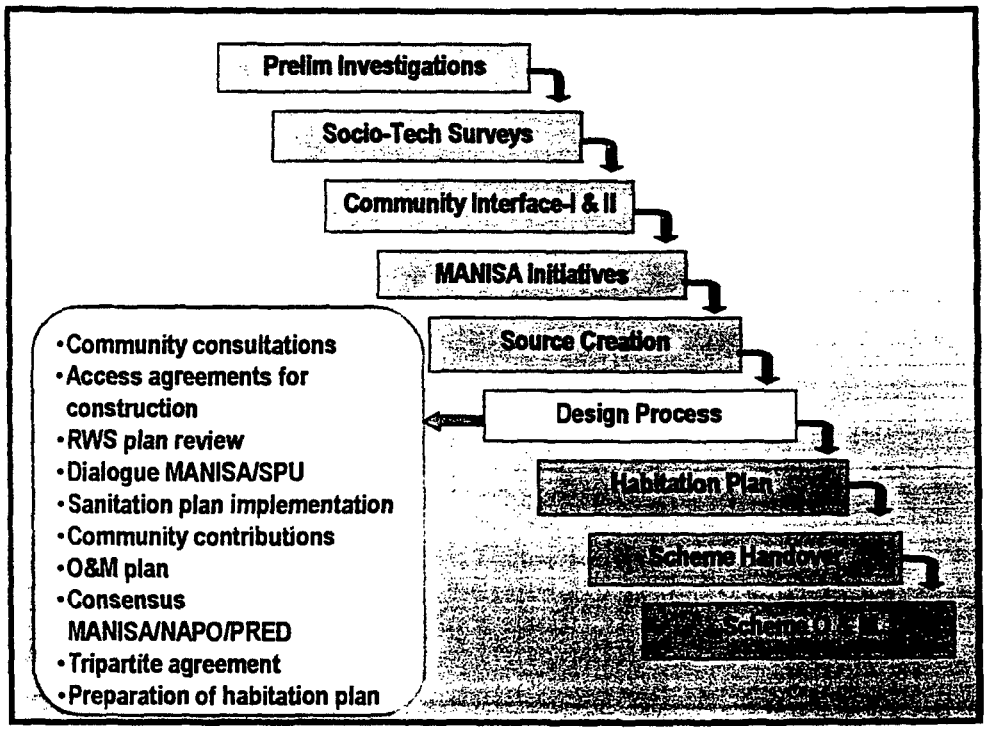

Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
Scheme O & M
•GP/Sarpanch/Community contacts effected
•Habitation Social Mapping - PRA
•Household Survey
•Water use assessment - involvement of women, focus group interviews

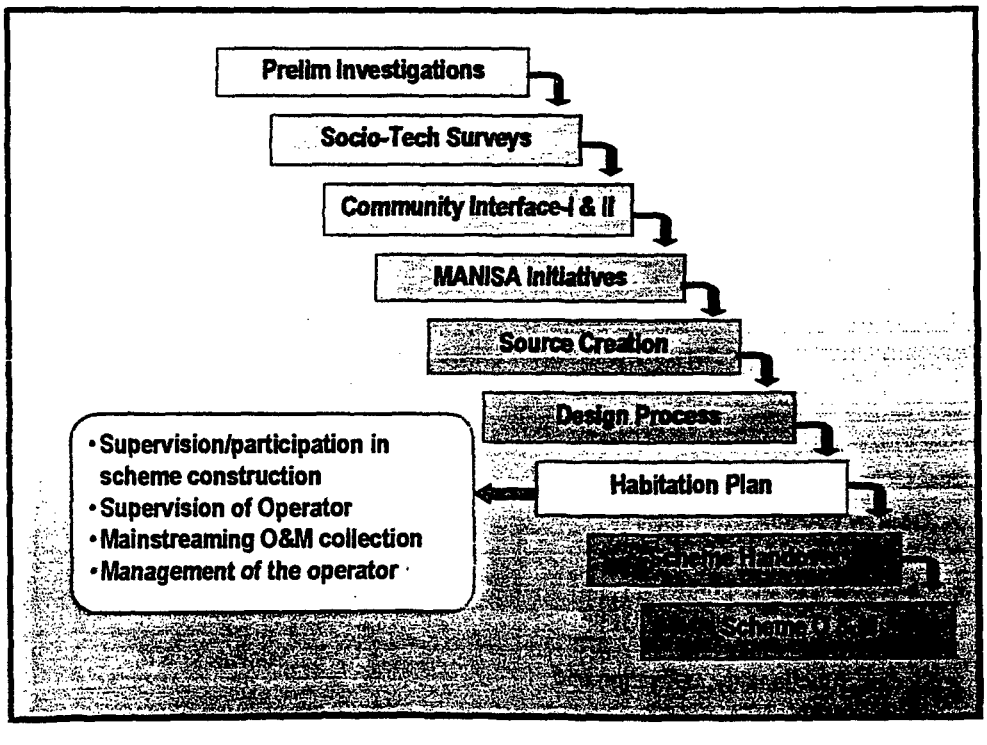

Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
PHASE I
• Strengthening of SPU/Social Desk
• Household and street meetings
• Habitation meetings
• Orientation - Project objectives, MANISA formation, O&M responsibility sharing, village sanitation, identification of representatives
• Agreement on date for MANISA formation

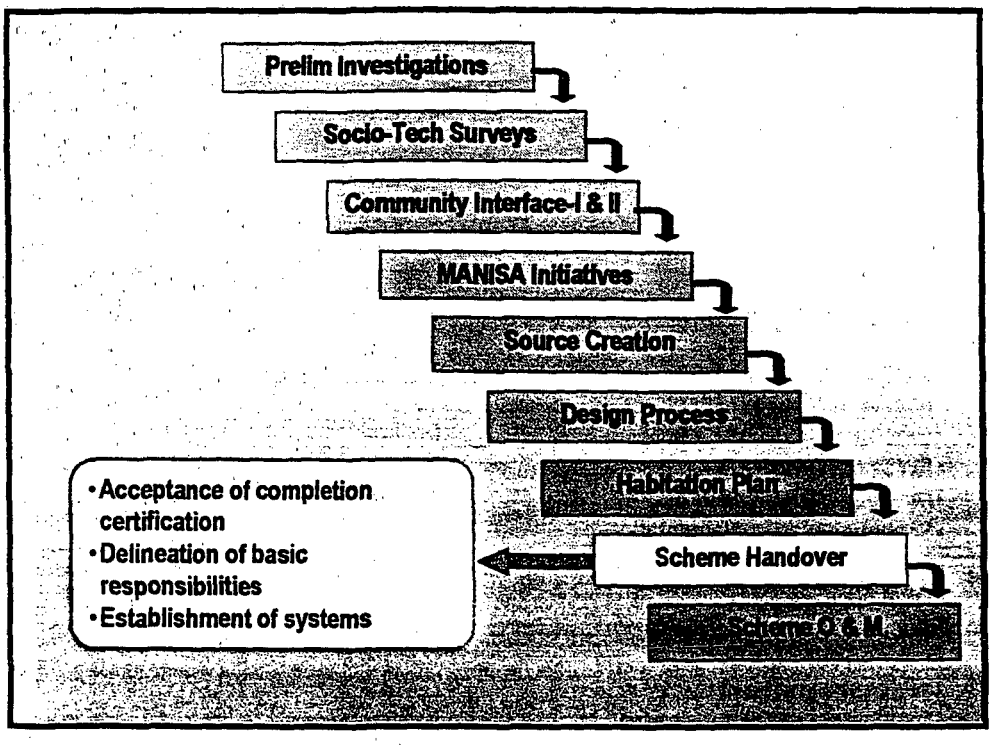

Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
Scheme O & M
PHASE II
• Finalisation of members
• Formation of the MANISA
• Operator identified
• Project objectives, responsibilities and functions restated
• Identification of the COs
• Participation in geological and technical activities by the members

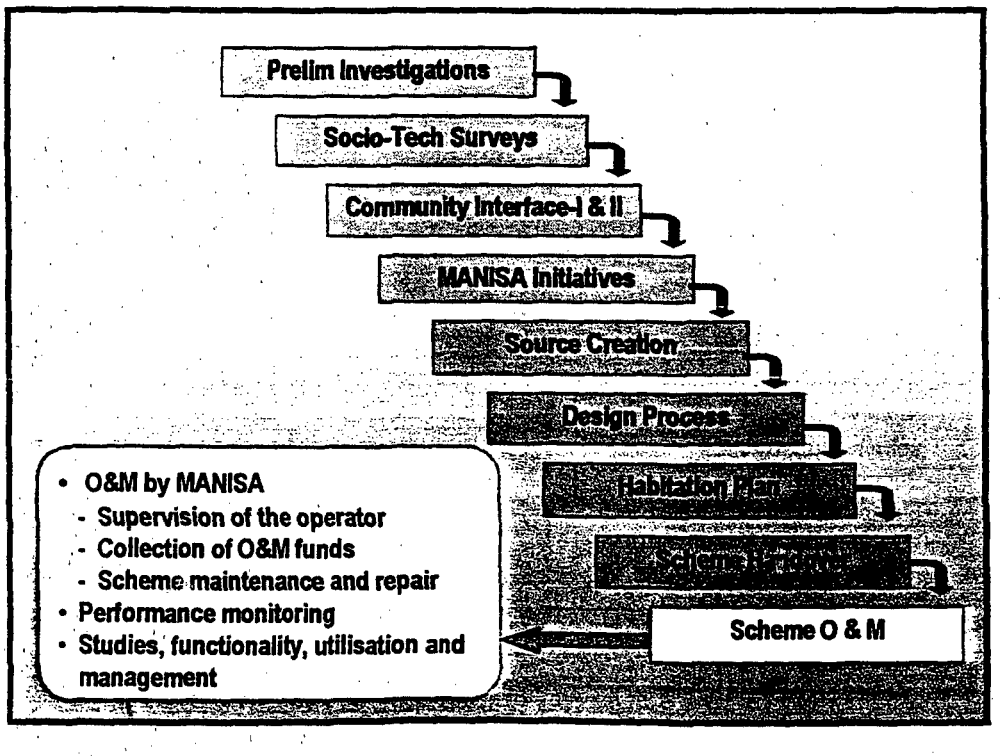

Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
Scheme O & M
•Habitation/MANISA meetings
•CO orientation to habitation
•Design, discussion/finalisation
•San-plan preparation and execution
•Community token contribution mobilisation
•Opening of Post Office account
•Getting required land agreements
•Resolving community differences


Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
•Mobilising related land agreements
•Participating/assisting in all related activities
•Protection of source (vandalism, contamination, etc)


Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
•Community consultations
•Access agreements for construction
•RWS plan review
•Dialogue MANISA/SPU
•Sanitation plan implementation
•Community contributions
•O&M plan
•Consensus MANISA/NAPO/PRED
•Tripartite agreement
•Preparation of habitation plan


Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
•Supervision/participation in scheme construction
•Supervision of Operator
•Mainstreaming O&M collection
•Management of the operator


Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
Scheme O & M
•Acceptance of completion certification
•Delineation of basic responsibilities
•Establishment of systems


Prelim Investigations
Socio-Tech Surveys
Community Interface-I & II
MANISA Initiatives
Source Creation
Design Process
Habitation Plan
Scheme Handover
Scheme O & M
• O&M by MANISA
- Supervision of the operator
- Collection of O&M funds
- Scheme maintenance and repair
• Performance monitoring
• Studies, functionality, utilisation and management

7. Capacity Building Initiatives

Capacity building initiatives for stakeholders in the project at all levels has been an integral part of the program. Given the approach and scope of the project, which varied from the regular RWSS program, the need for providing inputs at every stage was essential. Capacity building initiatives had to address a wide range of issues from conceptualisation to implementation and even beyond. Further, the program itself being new and experimental in nature, included the element of "learning-while- doing". The most effective way of incorporating lessons learnt was found to be through the various capacity building initiatives and programs. Consistent efforts have been made from the Inception Phase to identify the training and capacity building needs of the various partners in the project, with both in-house and external assistance. The initiatives in this direction were categorised into eight groups.

Training Operators in Pipe Jointing & Repair

A list of the various training programs organised is given below:

At Hyderabad Level:

1. **Programs for PRED (Hyderabad)**
- Workshop on project formulation & strategy
- Workshop on formalisation of Water Management Committees
- Workshop on Hydrogeological Information Systems (HIS)

2. **Programs for NGOs**
- Workshop on Project Planning Matrix for NGO component
- Consultative workshop of NGOs

3. **Gender Networking**
- Gender Networking Workshop II

4. **Programs for NAPO**
- Team up software for elaborating logical frame work
- HP - Training
- Training on the use of computers- specifically the CorelDraw software
- Workshop- Sharing of experiences Grama Vikas, Orissa
- Exposure visit of Dutch supported DWSS program partners from India to the Netherlands
- Workshop - The enhanced role of resource centres in capacity building
- Workshop on writing and presenting better reports

At Vizianagaram Level:

5. **Programs for the SPU- PRED (Vizianagaram)**
- Workshop to finalise selection of Mandals
- Training on operation of pumping test equipment and conducting yield tests
- Orientation workshop-I
- Orientation training on Hydrogeological software (ILWIS)
- Field training for hydrogeologists in electro-magnetic investigations techniques-using EM 34
- Habitation planning workshop
- Orientation Training on computers
- Roles & Responsibilities of MANISA
- Calibration of completed PWS schemes

6. **Programs for Community Organisers**
- Orientation Training for the COs
- Training on techniques of PRA-Social mapping, Water Needs Analysis
- Orientation Training on the development of village profiles
- How to conduct a socio economic survey
- Practical exposure to the Hydrogeological survey
- Orientation to Sanitation Plan
- COs participated along with the MANISA/HP mechanics, Scheme operators in various training programs
- MANISA meetings and record maintenance
- O&M collection strategies
- Usage of monitoring formats
- Participatory approaches
- Orientation to development approaches
- Chlorinating processes
- Training design &session planning skills

At Mandal Level:

7. **Programs for the MANISA**
- Orientation training for the MANISA members
- Roles and responsibilities of the MANISA
- Training on health and hygiene for women
- Workshop on management and maintenance of scheme
- Workshop on sustainability and withdrawal strategies
- Re-orientation training for MANISA
- Consultative workshop of Sarpanches and MANISA office bearers
- Workshop for the formation of the Apex Body
- Training on Accountancy and Book keeping to MANISAs

8. **Programs for Operators and Mechanics:**
- Training for HP mechanics- I
- Training for HP mechanics -II
- Training for Operators of the PWS schemes in Pipe Jointing, Submersible Pumps and Electrical Systems

Details of Capacity Building initiatives by the project are provided in **Annexure 14: Capacity Building.**

Annexures

List of Annexures

Annexure No.	Title	No. of Pages
Annexure 1:	Introductory Visit to Vizianagaram	6
Annexure 2:	Format for Preliminary Investigation Data	5
Annexure 3:	Format for Water Needs Analysis	1
Annexure 4:	Guidelines for Village Technical Survey	2
Annexure 5:	Water Quality Data	5
Annexure 6:	The Water Management Committee - MANISA	5
Annexure 7:	Proceedings of Habitation Planning Workshop held on 21-22 January 99, Vizianagaram	9
Annexure 8:	Water Demand Assessment in Jami Mandal	8
Annexure 9:	Sanitation Plan Format	1
Annexure 10:	O & M Collection and Monitoring Forms	3
Annexure 11:	Tripartite Agreement	1
Annexure 12:	Progress Report	2
Annexure 13:	Completion Report	1
Annexure 14:	Capacity Building	7
Annexure 15:	O & M Responsibilities	4
Annexure 16:	Guidelines for Calibration of PWS Schemes	12

Annexure 1: Introductory Visit to Vizianagaram

Dates: 6-8 August 1998
Participants: PRED – SE Projects, Visakhapatnam, EE – Projects & EE – RWS of PRED, Vizianagaram, along with their technical staff

NAPO - Team Leader, Technical Programme Coordinator, Social Programme Coordinator, Project Management Advisor

Introduction

Following a series of discussions between PRED/RNE during May – July 98, it had been decided that there should be a shift in the territorial implementation area of the AP III project from Nalgonda District to Vizianagaram District. As a result, a preliminary visit to the district was planned. A broad Terms of Reference for this was outlined as follows:

Objectives: To gain broad impressions and obtain a quick overview of Vizianagaram District and its habitations on the following:

Villages/habitations – size, spread, distance, affinity, social stratification, water supply status, condition of sources, watershed programs, etc.
Study, if possible, existing community practices vis-à-vis O&M involvement, cost participation, community mobilisation and initiatives.
NGOs their area of operation, specialisation, existing networks.
Other relevant and proposed projects in the area.
Institutional capabilities and response towards project approach methodology

Methodology: Discussions with District Collector, Mandal Development Officers, PRED staff on the situation in various Mandals regarding the following aspects, supplemented by field visits to selected areas:

Existing Water supply System – An overview
Reports of Water Quality, if any
Presence of NGOs and their impact
Receptiveness of the community towards participation
Proposed PWS schemes in the area/pipeline/ towards finalisation.

Prior to this visit, the Superintending Engineer (Projects), Visakhapatnam met with NAPO at the ENC's office in Hyderabad, with discuss the above TOR. The discussion in the ENC's office can be summarised as follows:

The proposed project area was indicated by PRED as 13 Mandals of Vizianagaram District, in three distinct groups.

Since it would not be possible to travel through the entire project area, it was agreed with PRED that the initial visit would be limited to four Mandals, two each in the northern and southern parts of Vizianagaram for looking into the

establishment of the APIII project approach. The immediate objective of travelling to different Mandals was to was to provide a basis for identifying four or five work locations in two Mandals for focussing AP III project activities in the immediate future.

The four Mandals would be physically surveyed by dividing the field visits into 2 groups. Within the selected Mandals, the focus would be on understanding the specific areas through further talks with local level informants viz., AEE, ZPP, MRO, MDO, DRDA staff, etc., as well as the locally politically elected GP members and Sarpanchs.

Day 1, *6* August 98, Discussions in Vizianagaram

A meeting was held at the PRED office with SE Projects chairing the meeting along with his officers. The agenda for the meeting was set as follows:

To introduce the objectives of the NAP office to PRED staff in Vizianagaram.
To review the water supply related situation in the designated 13 Mandals briefly to prioritise and identify the initial work area of 2 Mandals.

The discussions are summarised in the following table. In the discussions it was suggested by SE (Projects) that Saluru and Parvatipuram be ruled out for immediate activities for the following reasons:

Saluru: There may not be positive responses from the contractors as PRED has been fairly unfavourable in the past. The sources are not easily approachable and the NGO interventions sought may be thwarted by the local vested interest who normally act as middlemen in the tribal areas.

Parvatipuram: While giving the same arguments as mentioned above, it was also seen as a politically sensitive area and NAP O should take up this Mandal at a later stage. Geologically this area posed problems on well siting and water quality problems.

The SE also suggested that NAP postpone investigations in the northern area of the district for the immediate future.

It decided to make field visits the following days in two teams to the following Mandals:

Jami and Srungavaripukota Mandals - Team A: (NAPO - Hanrath, Daw, Dutt, AEE-PRED HQ -Vijay Kumar)

Bobbili and Gantyada Mandals. - Team B (NAPO - Sharath, Jayaram, Das, Aggarwal)

Based on this suggestion the above-mentioned Mandals were chosen for preliminary surveys.

This was followed by a brief visit to the Joint Collector's office. The Collector was not available.

Day 2, 7 August 98

Team B, proceeded to Vizianagaram at 8 a.m., and then was accompanied by Dy. E.E. Saluru upto Bobbili and thereafter by Bobbili Dy. E.E. From Bobbili, the following visits were made:

1. Bobbili: (Approx. 60 Km from Vizianagaram): The Ampavalli PWS that is under construction was visited. The scheme based on an infiltration well on river Vegavathi. It covers five GPs but only two GPs come under the Bobbili Mandal. There is no record of O & M in any of these habitations. The sanitation conditions need to be improved. No local officials were available for any further discussions. The concerned Dy. EE and AEEs were present at the site and also at the Mandal headquarters.

A second scheme sites, which had not received any approvals yet but already formulated was then visited. The scheme covers the following villages totalling a population of 7000. A copy of the scheme proposal was given to the team . The scheme proposed to cover an approximate population of 7000 and cost Rs.60 lakhs. (per capita cost Rs.855.00, ± 5%).

The Mandal officers concerned as well as any other local persons could not be contacted, as they were busy with the Janmabhoomi program. There are no reported NGO activities in these areas.

2. Gantyada (Approx. 15 Km from Vizianagaram): Gantyada is perhaps one of the better developed of the Mandals in the Vizianagaram district. It boasts of various MPs, MLAs hailing from this Mandal. The main water source to Visakhapatnam and Vizianagaram is from Tathipudi Reservoir in Gantyada Mandal. At the later part of the day the MDO and the nodal officer concerned met the team. They suggested the following habitations for the AP III scheme to start, as they feel that O&M criteria as well as responses from the community would be positive- Penasam, Madhupada, Korlam, Chandramapeta, Chinna Manapuram, Tathipudi and Ginjeru. They also mentioned that these habitations were earlier chosen as pilot villages for the Janmabhoomi programs.

A field visit to Pentasreemapuram was made where PRED proposes to set up a scheme covering 5 Habitations at a cost of Rs. 50 lakhs. This scheme is pending approval. The Sarpanch of the main habitation provided details on water supply related activities in the area. He mentioned that these areas have history of various user forums for irrigation, fishing, agriculture etc. and hence forming a drinking water users association should not be a problem. There had been attempts to drill borewells in the area but unsuccessfully. The sanitation in the villages needs to be looked into. There were no NGO activities in these areas, however the Sarpanch mentioned that World Vision had approached these habitations earlier, but no response/ feedback had ever come to them thereafter.

General Observations

The original listing of problem habitations, PRED does not show habitations of less that 500 population. Literacy rate reported by PRED staff was to the tune of 40-45%. There are many minor irrigation tanks spread all over the Mandals with abundant water at the moment, however PRED says they do not last till summer. All the schemes that are under construction in the areas talk about the overall PWS and the habitation distribution system has not been formulated.

Day 3, 8 August 98

A debriefing session was held within the NAP staff, prior to meeting the SE. The teams shared their experiences and observations of the previous meeting. While team B narrated its experiences, as mentioned above, Team A had the following observations in general:

A visit was made to a potential PWS site at Mangalpalem in Kothavlasa Mandal, close to Visakhapatnam. The would cost around Rs.15 lakhs value covering a population of 2000. Observations were: Source- Infiltration Well, Pump house not completed. OHSR was under construction, no Distribution system work had been planned, and a severe sanitation problem was seen, with garbage all over. The nearby Sugar mills may pose a pollution problem

In Jami Mandal: Met the ZPTC president who was very enthusiastic about the concept. Overall impression was that further preliminary investigations should be conducted for a detailed evaluation.

A separate meeting with the SE (Projects) followed. The minutes of the meeting are:

Participants : Mr. Naidu. SE (Projects), Mr. Frank Hanrath, TL, Mr. Raj Kumar Daw TPC, Ms. Anu Sharath, SPC, M. Jayaram, PMA.

TL invited the SE to the meeting and presented NAPO's observations on the visit as a summary. He discussed NAPO's terms of reference and reiterated the objectives of immediately starting the project on a fast track basis, including community participation.

General field observations including sanitation and local distribution system was referred to. The lack of water quality testing methods and validity of the data and its verification was mentioned as a drawback. The size of the habitations mentioned in the PRED listing needs to be reviewed.

The SE (projects) while appreciating our observations responded as follows:

Community Participation: There is no record of a successful community participation in a scheme in the district as PRED has done any work in this area. He however suggested

that villages be prioritised where this methodology will work. He reiterated however that Gantyada and Jami are still the best Mandals to start with.

Sanitation: While the SE agreed that the sanitation and hygiene levels left much to be desired the government has launched a program wherein 1700 platforms for hand pumps will be created with proper wastewater disposal. He anticipates that this program will take some time to take off.

Water Quality: The SE emphasised the need for establishment of a laboratory at the district level as well as the automation in data collection. He further reiterated that the persons were motivated and this problem could be solved with proper equipment and training.

Size of Habitations: The SE was not aware of the need and purpose for this information. Data had been presented on large villages and could be done for smaller habitations also.

The discussion then moved towards setting up a Special Project Unit (SPU). The SE felt for the scale of operation envisaged for the first year there may not be a need for new staff to be recruited. He felt that there would be a need for two subdivisions in the future.

It was agreed that NAPO would assign to the Project officers to visit Habitations/Villages in two Mandals for a brief reconnaissance survey of the designated areas.

Summary of Information on 13 Mandals of Vizianagaram District – August 1998

Name of the Mandal	NGOs Presence	Watershed Programs	PWS existing	Quality problem	Quantity Problem	PWS under investigation	Remarks if any
Saluru	CDC	Proposed by SGWD	2	TDS/Brackishness	18 access, 6 qty	None	Existence of springs down the valley
Bobbili	None	None	1+1	17% TDS, 80% Potable	Basement Rock	Rs.60 lakhs	New scheme with infiltration well.
Parvatipuram	Jattu, ITDA HQ.	Check Dams	None	In 6 habitations	In 17 habitations	Just started	11 habitations with sources identified
Makkuva	None	None	3+4	None	Well siting	None	Existence of 3 rivers
Dattarajeru	BGVS	Soil Conservation	7	In 3 habitations	Well siting in 5 habitations	2 started	No streams
Gajapathinagaram	BGVS	None	4	Brackishness reported	Not reported	None	10 habitations by the river
Gantyada	None	None	15	Salinity reported		CPWS proposal pending	
Srungavarapukota	None	None	13	Fluoride in 14 habitations	No reports	None	Detailed siting proposed in the
Jami	NYK	None	7	Brackishness reported	No reports on quantity	None	Source is mainly the river bed. 17 problem villages
Veypada	None	None	5	Bad quality, nature not clear	No reports on quantity	None	Detailed siting proposed in the
Lakkavarapukota	None	None	10	In small pockets	Low yielding in pockets	None	Detailed siting proposed in the
Kothavalasa	None	Old WS	7		Limited sources	None	Detailed siting proposed in the
Vizianagaram	JVV/PM	None	7	All brackish	No reports	2	

Annexure 2: Format for Preliminary Investigation Data

Administrative details

The G.P..... belongs to the .....Mandal of Vizianagaram District. It is at a distance of by ....Km and ..... Km from the Mandal and district headquarters respectively. The GP is adjoining ...GPs/ and/ or.....Mandals/ .....district. The GP is on the banks of the river ..... and/or .....forest.....(other major feature).

The GP consists of ..... habitations namely,

1.
2.
3.

(Comments on habitation patterns, spread, contiguity. Habitations that are revenue villages. Nature or smaller and satellite habitations.)

The Village GP is represented by .....ward members. The Sarpanch of the GP is .....belonging to .....(political) Party.

Demography

Habitation	**HHs**	**1991/ 2001 Population**	**Population reported ..... (mm/YY)**

(Source: .....)

Caste-wise break-up of the population

Habitation	S.C.		BC		Others		Total	
	M	F	M	F	M	F	M	F
Total								

(Source: .....)

(Comments on – Is untouchability evident? Do Harijans live distinctly apart? Separate habitation? Which caste group constitutes the majority? Is there a caste-to-habitation history? Where do the upper caste groups live? How many families do they constitute? Which groups run the shops, businesses, and commerce? Where do they live? What are the major means of livelihood of different cast groups?)

Cattle Population of Habitation/ GP

Cattle	Population
Cows	
Buffaloes	
Oxen	
He-Buffaloes	

Village Infrastructure

Electricity

The power supply to the village is

2 Phase : Non-summer months: .....hrs
Summer: .....hrs
3Phase : Non-summer months: .....(timings)
Summer: .....(timings)

There are .....(nos.) Government transformers supplying power to the domestic requirements and .....(nos. approx.) agricultural wells/ bores.

Bank

There is an .....(name/ type) bank in the .....(Habitation name).

Schools

The nearest High school to the GP is in .....(place), at a distance of about .....Km. .....(Habitation name/s) has/ have a Government Upper Primary/ Primary school. The hamlet/s .....does/do not have any kind of school.

Transport

A bus to/ from .....(town/ place) passes through the village .....(times) a day. Cycle rickshaws transport passengers to ....., ...Km away, from where buses to ....., ... and .....are frequently available.

There is a railway station .....Km away from the GP at ..... where passenger/ express trains stop.

Communications

A Branch Post Office, a telephone (powered by a solar battery?) in the panchayat office are the means of communication available to the villagers.

Health

There is .....(one/ no) Government primary health centre and ..... private (RMP, BAMS?) doctors catering to the health needs of the villagers. (A veterinary doctor visits the village periodically?).

Informal Groups

(Mahila mandal? Dwacra? active, membership).
(Programmes by NGOs? Health, education, economic activities?)

Occupational Distribution of the Villagers

Occupation	Population
Agriculture	
Agricultural labour	
Business	
Dhobi, Barbers, toddy tappers, smiths, weavers etc.	
Others	

Agricultural practices, Returns and wages.

(Water intensive/ irrigated crops like Sugarcane and Paddy are extensively cultivated?. About .....nos. power pumps on bores. Irrigation tank – large? Small? Irrigate how much area? for what crop? Main crops are pulses, groundnut and til (sesame) are grown in the wet fields as a third crop in a year and in the uplands as the main crop? Mango and teak plantations? River? River water used for irrigation? Recharging wells?

A return of Rs ..... per acre from sugarcane and Rs ..... per acre in two crops of paddy is estimated per year. Agricultural labour wages are Rs .....per day for women and Rs ..... for men.

Drinking water

Bore wells are generally drilled to a drilled to a depth of about .....m and fitted with hand pumps by (DTH drilling rigs? Hand drilling?.....). There are open wells (seasonal?) with most (larger? Smaller?) habitations. Smaller habitations are dependent on drinking water from the nearby agricultural wells?

The habitation-wise distribution of hand pumps and their details are as follows.

Hamlet	Pop.	Hand Pumps		Open Wells	Quantity Good/ Poor/ Seasonal/ Dry	Quality - Good/ Poor/ Bad/ Brackish/ Iron/ Poor Taste
		Work-ing	N/W			

Besides the above there are .....personal/ private hand pumps in ..... and ..... . All private hand pumps are in the richer households thus being inaccessible to the general public?

Quantity and Quality of drinking water.

Quantitatively most of the HPs are reported to be high/ adequate/ poor yielding . Qualitatively .....

Water needs assessment

The population figures of the Hamlets show an average household size of .....(nos. of members/ HH). An assessment of the quantity of water required per family showed that caste and size of the house play an important role? The following table estimates the water needs of a house hold in .....(name of habitations).

Purpose		
Bathing		
Cooking		
Drinking		
House cleaning		
Washing clothes		
Cattle		
Total		

Recommendations

Problem	Need expressed by the people	Options
1. The HP-people ratio of the GP is ..... 2. There is lot of physical strain and time consumption to the women in fetching water.	A powered borewell with localised storage tanks with taps (Stand posts/ Cisterns)	The bore at .....(location) is high yielding. The possibility of using it as a source for a PWS system covering ..... (habitation name) can be explored.
3. The HP/s and OW/s of .....(habitation name) function seasonally	A hand pump drilled by a rig near the school.	Provision of a sustainable HP at .....(location)
4..... (nos.) of the HPs in at.....(location) are mal-functioning/ have the following problems:	PWS system	Rehabilitation of the HPs for the immediate reduction of Hardship of the people.

O&M

Discussions with the people and Sarpanch revealed that they will organise themselves and raise resources for O&M.

Annexure 3: Format for Water Needs Analysis

Habitation : .....
Revenue Village : .....
Gram Panchayat : .....

Index	Head of the household	No of..		No. of pots for..			Lit/	Per Capita Demand(l)		
		People	Cattle	People	Cattle	Oth.	Pot	Human	Cattle	HH
	Totals:									

Norms & ... and of demand
Women's ...

Annexure 4: Guidelines for Village Technical Survey

In AP III, it is required that accurate field surveys should form the basis for design and renovation of water supply systems. For this purpose, concerned AEE/AE will be required to conduct compass and level surveys for each habitation proposed for work under AP III. Hence, it is mandatory that proper survey equipment and manpower be assigned for this work as soon as the choice of a village or habitation is finalised for further investigation after the preliminary visit. The field work should result in accurate civil survey maps of habitation layouts, roads, location of existing hand pumps, existing piped water distribution network, if any, possible alignments and longitudinal sections of future transmission and distribution system.

Survey field work must be carried out as per agreed time schedules since this work forms an integral component of the entire planning process of the delivery of AP III project strategy.

The following guidelines are provided for the necessary field work.

1. Before starting the civil survey, a reconnaissance survey should be completed by the surveyor by walking around the habitation to ascertain the area that was to be surveyed and for familiarisation.

2. The surveyor shall to identify two to three permanent objects/ building at different ends of the habitation to set up temporary benchmarks. The objects and buildings could be culverts, bridges, religious, institutional, or educational buildings. Care was taken to set the benchmarks at points or places where they would not be tampered with (for example, walls of a building are preferable to its floor).

3. Where a revenue village is constituted by a number of habitations, all habitations that are to be considered for future work, must be surveyed. Benchmarks should be set in each habitation and should be connected with main benchmark in the main habitation.

4. All important landmarks/ features of the habitation shall be surveyed for both direction and levels (the Preliminary Study report provided an indication of the features to be surveyed).

5. Special attention should be given to plot the existing drainage system of the habitation. The existing drainage paths within the habitation should be located on survey map. Natural drainage paths in and around the habitation should also be surveyed.

6. Bearings and distances should be taken for all streets or street corners in all habitations. Reference bearings of all approach roads of habitations should be taken. All important features within the habitation (temples, schools, etc.) should be located as reference points with distances.

7. Levels should be taken at preferably at 15 m intervals on all streets of all habitations and at every point where the level difference was perceptible. Levels would be taken along the centre of the road and along the sides if the level difference between the centre and side were appreciable. The road width at all important points must be taken.

8. Levels and distance of all existing water supply scheme features within the habitations (i.e. hand pumps, open well - drinking or irrigation, PSPs, Cisterns, GLSR, Valves, bends and branches in pipelines, etc.) should be surveyed for inclusion in the final map. This information has to be further supplemented from existing records regarding pipeline and valve details such as diameters.

9. Major topographical features like hills, streambeds, drainage paths, etc, that may be pertinent to the future water supply system should also be surveyed (with levels and bearings).

10. All field records should be maintained according to standard Civil engineering practices and should be recorded in a traverse book, to permit reference at any future point of time. All the stations should be named alphabetically in a proper sequence according to standard surveying practices. The survey should be preferably closed to minimise any errors. Any closing error should be scientifically corrected by transferring the error to all points/ stations.

11. A duplicate set of field records should be made available to NAPO soon after completion of field work.

Annexure 5: Water Quality Data

Water Quality Data of Existing and New Sources- Anamrajapet GP, Jami Mandal

Sl. No.	Habitation Name	Description	Lab.	Lab. Ref.	Date of Sampling	Date Analyzed	Potable
1.	Anamarajpeta	HP in front of P.school (HP1)	PRED-H	2212	10-Sep-98	15-Sep-98	
2.	Anamarajpeta	HP beside school (HP2)	PRED-H	2213	10-Sep-98	15-Sep-98	
3.	Anamarajpeta	HP in front of GPO (HP3)	PRED-H	2214	10-Sep-98	15-Sep-98	
4.	Anamarajpeta	HP2	PRED-V	NAP 23	12-Nov-98	13-Nov-98	
5.	Avanapuvari Kallalu		PRED-V		27-Aug-99		No
6.	Avanapuvari Kallalu		PRED-V		29-Jun-00		No
7.	Avanapuvari Kallalu		PRED-V		09-Sep-00		No
8.	Avanapuvari Kallalu		PRED-V		15-Feb-01		
9.	Bangaramma gudi		PRED-V		15-Feb-01		
10.	Bangarammagudi		PRED-V		27-Aug-99		No
11.	Bangarammagudi		PRED-V		09-Sep-00		
12.	Chellurivari Kallalu		PRED-V		17-Aug-99		No
13.	Chellurivari Kallalu		PRED-V		09-Sep-00		No
14.	Chellurivari Kallalu		PRED-V		15-Feb-01		
15.	Cherevulopala		PRED-V		09-Sep-00		
16.	Cherevulopala		PRED-V		15-Feb-01		
17.	Cherevulopala	GLOPL	PRED-H	3228	27-Aug-99		
18.	Dibbagudibadi		PRED-V		27-Aug-99		No
19.	Dibbagudibadi		PRED-V		29-Jun-00		No
20.	Dibbagudibadi		PRED-V		09-Sep-00		No
21.	Dibbagudibadi		PRED-V		15-Feb-01		No
22.	Gummidibba		PRED-V		27-Aug-99		No
23.	Gummidibba		PRED-V		29-Jun-00		No
24.	Gummidibba		PRED-V		09-Sep-00		No
25.	Gummidibba		PRED-V		15-Feb-01		No
26.	Harijanwada	New source	PRED-V	2658/98	08-Jan-99	09-Jan-99	
27.	Harijanwada		PRED-V		27-Aug-98		No
28.	Jaggaipeta	HP near open well (HP10)	PRED-H	2215	10-Sep-98	15-Sep-98	
29.	Jaggaipeta	HP near temple well (HP 4)	PRED-H	2216	10-Sep-98	15-Sep-98	
30.	Jaggaipeta	new source	PRED-V	2714/98	11-Jan-99	12-Jan-99	
31.	Jaggaipeta		PRED-V		27-Aug-99		No
32.	Jaggaipeta				27-Aug-99		
33.	Kanakalavari Kallau		PRED-V		09-Sep-00		No
34.	Kanakalavari Kallau		PRED-V		15-Feb-01		
35.	Kanakalavari Kallau		PRED-H	3207			No
36.	Musirikadabadi		PRED-V		27-Aug-99		
37.	Musirikadabadi		PRED-V		09-Sep-00		
38.	Musirikadabadi		PRED-V		15-Feb-01		
39.	Pathetibadi		PRED-V		09-Sep-00		No
40.	Pathetibadi		PRED-V		15-Feb-01		

Water Quality Data of Existing and New Sources-Anamrajapet GP, Jami Mandal (contd.)

Sl. No.	Habitation Name	Description	Lab.	Lab. Ref.	Date of Sampling	Date Analyzed	Potable
41.	Pushpagari	HP (HP 11)	PRED-H	2222	10-Sep-98	15-Sep-98	
42.	Pushpagari	River Gosthani	PRED-H	2223	10-Sep-98	15-Sep-98	
43.	Pushpagiri	River Gosthani	PRED-V	NAP 20	14-Oct-98	15-Oct-98	
44.	Pushpagiri	River Gosthani	KGH	C-359	25-Oct-98	26-Oct-98	
45.	Pushpagiri	HP11	PRED-V	NAP 22	12-Nov-98	13-Nov-98	
46.	Pushpagiri	PWS Source	PRED-V		27-Aug-99		No
47.	Seethanagaram	HP behind the church (HP 6)	PRED-H	2218	10-Sep-98	15-Sep-98	No
48.	Seethanagaram	HP in front of school (HP 7)	PRED-H	2219	10-Sep-98	15-Sep-98	
49.	Seethanagaram	HP in the lane beside post box (HP 8)	PRED-H	2220	10-Sep-98	15-Sep-98	
50.	Seethanagaram	HP (HP 9)	PRED-H	2221	10-Sep-98	15-Sep-98	
51.	Seethanagaram	New source	PRED-V	2715/98	12-Jan-99	12-Jan-99	
52.	Seethanagaram		PRED-V		27-Aug-99		No
53.	Seethanagaram				27-Aug-99		
54.	Vedurlapatti		PRED-V		09-Sep-00		No
55.	Vedurlapatti		PRED-V		15-Feb-01		

Water Quality Data of Existing and New Sources- Gantyada Mandal

Sl. No.	Habitation Name	Description	Lab.	Lab ref	Date of Sampling	Date analyzed	Potable
1.	Chandrampeta	New Source	PRED- V	02290350 1NAP	15/09/99		No
2.	Chandrampeta		PRED- V	02290350 1NAP	15/09/99		No
3.	Chandrampeta	HP2	PRED-H	3224			No
4.	Chandrampeta	HP4	PRED-H	3226			Yes
5.	Chandrampeta	HP5	PRED-H	3227			No
6.	Chandrampeta	HP School	KGH	C-361	25/10/98	26/10/98	No
7.	Chandrampeta	HP BC Colony	KGH	C-362	25/10/98	26/10/98	Yes
8.	Chandrampeta	HP SC Colony-1	KGH	C-363	25/10/98	26/10/98	No
9.	Chandrampeta	HP SC Colony-2	KGH	C-364	25/10/98	26/10/98	No
10.	Chandrampeta	HP GPO	KGH	C-365	25/10/98	26/10/98	Yes
11.	Chinna Madhupada	New Source	PRED- V	22900801 NAP	15/09/99		
12.	Chinna Madhupada		PRED-V	02290080 1NAP	02/03/00		No
13.	Chinna Madhupada	Gostani river	PRED-V	NAP13	14/10/98	15/10/98	
14.	Chinnamanapuram	New Source	PRED-V	02290280 1NAP	16/09/99		Yes
15.	Chinnamanapuram			02290280 1NAP	16/09/99		No
16.	Chinnamanapuram		PRED- V	02290280 1NAP	16/09/99		
17.	Chinnamanapuram	HP5	PRED-H	3212			Yes
18.	Chinnamanapuram	HP village entrance	KGH	C-366	25/10/98	26/10/98	No
19.	Chinnamanapuram	HP School	KGH	C-367	25/10/98	26/10/98	No
20.	Chinnamanapuram	HP SC Colony	KGH	C-368	25/10/98	26/10/98	No
21.	Chinnamanapuram	HP Chakalipeta	KGH	C-369	25/10/98	26/10/98	No
22.	Chinnamanapuram	HP temple	KGH	C-370	25/10/98	26/10/98	No
23.	Ginjeru	New Source	PRED- V	02290190 1NAP	15/09/99		No
24.	Ginjeru	HP1	PRED-H	3236			No
25.	Ginjeru	HP2	PRED-H	3237			No
26.	Ginjeru	HP5	PRED-H	3238			Yes
27.	Ginjeru	HP6	PRED-H	3239			Yes
28.	Ginjeru	HP7	PRED-H	3240			Yes
29.	Ginjeru	HP8	PRED-H	3241			Yes
30.	Ginjeru	HP BC Colony	KGH	C-389	25/10/98	26/10/98	Yes

Water Quality Data of Existing and New Sources- Gantyada Mandal (contd.)

Sl. No.	Habitation Name	Description	Lab.	Lab ref	Date of Sampling	Date analyzed	Potable
31.	Ginjeru	HP Bridge side	KGH	C-386	25/10/98	26/10/98	No
32.	Ginjeru	HP opp. Temple	Opposite temple	KGH	25/10/98	26/10/98	No
33.	Ginjeru	HP SC Colony	KGH	C-388	25/10/98	26/10/98	No
34.	Ginjeru	HP Rajavedhi	KGH	C-390	25/10/98	26/10/98	Yes
35.	Ginjeru	HP BC Colony II	KGH	C-391	25/10/98	26/10/98	Yes
36.	Gopalapalli	Infiltration well	PRED-V	NAP10	14/10/98	15/10/98	
37.	Gopalapalli	Ghostani river	PRED-V	NAP14	14/10/98	15/10/98	
38.	Jagaram	Gostani river	PRED-V	NAP12	14/10/98	15/10/98	
39.	Korlam	New Source	PRED- V	02290240 1NAP	31/01/00		
40.	Korlam	New Source2	PRED- V	02290240 1NAP	27/03/00		No
41.	Korlam	New Source3	PRED- V	02290240 1NAP	03/04/00		Yes
42.	Korlam	HP7	PRED-H	3234			Yes
43.	Korlam	New Source1					
44.	Korlam	HP2	PRED-H	3229			No
45.	Korlam	HP3	PRED-H	3230			No
46.	Korlam	HP4	PRED-H	3231			Yes
47.	Korlam	HP5	PRED-H	3232			No
48.	Korlam	HP6	PRED-H	3233			No
49.	Korlam	HP9	PRED-H	3235			Yes
50.	Korlam	HPCommunity Hall	PRED-H	2204	02/09/98	07/09/98	Yes
51.	Korlam	HP29210107	PRED-H	2201	02/09/98	07/09/98	Yes
52.	Korlam	HP 29210103	PRED-H	2202	02/09/98	07/09/98	No
53.	Korlam	HP Weavers' Society	PRED-H	2203	02/09/98	07/09/98	No
54.	Korlam	HP BC Colony I	KGH	C-383	25/10/98	26/10/98	No
55.	Korlam	HP BC Colony II	KGH	C-384	25/10/98	26/10/98	No
56.	Korlam	HP Ramalayam	KGH	C-385	25/10/98	26/10/98	No
57.	Korlam K. Kallalu	HP main street	KGH	C-377	25/10/98	26/10/98	No
58.	Korlam K. Kallalu	HP DPEP School	KGH	C-382	25/10/98	26/10/98	No
59.	Mushidipalli	River Ghostani	PRED-V	NAP17	14/10/98	15/10/98	
60.	Mushidipalli	Infiltration Well Nr 2	PRED-V	NAP18	14/10/98	15/10/98	
61.	Pedda Madhupada	Infiltration Well	PRED- V	02290080 1NAP	15/09/99		
62.	Pedda Madhupada	HP1	PRED-H	3213			No
63.	Pedda Madhupada	HP2	PRED-H	3214			No
64.	Pedda Madhupada	HP3	PRED-H	3215			Yes
65.	Pedda Madhupada	HP4	PRED-H	3216			Yes

Water Quality Data of Existing and New Sources- Gantyada Mandal (contd.)

Sl. No.	Habitation Name	Description	Lab.	Lab ref	Date of Sampling	Date analyzed	Potable
66.	Pensam	Well2	PRED- V	02290300 1NAP	16/09/99		No
67.	Pensam	Well3	PRED- V	02290300 1NAP	16/09/99	No	No
68.	Pensam			02290300 1NAP	07/02/00		
69.	Pensam	Bore Well	PRED- V	02290300 1NAP	07/02/00		
70.	Pensam	HP4	PRED-H	3220			Yes
71.	Pensam	HP5	PRED-H	3221			Yes
72.	Pensam	HP6	PRED-H	3222			Yes
73.	Pensam	Well1					
74.	Pensam	HP1	PRED-H	3217			Yes
75.	Pensam	HP2	PRED-H	3218			Yes
76.	Pensam	HP3	PRED-H	3219			Yes
77.	Pensam	HP Village entrance	KGH	C-371	25/10/98	26/10/98	No
78.	Pensam	HP SC Colony	KGH	C-372	25/10/98	26/10/98	Yes
79.	Pensam	HP BC Colony	KGH	C-373	25/10/98	26/10/98	No
80.	Pensam	HP Stage side	KGH	C-374	25/10/98	26/10/98	No
81.	Pensam	HP Village centre	KGH	C-375	25/10/98	26/10/98	No
82.	Pensam	HP Village end	KGH	C-376	25/10/98	26/10/98	No
83.	Tathipudi	New Source	PRED- V	02290090 1 NAP	15/09/99		No
84.	Tathipudi				15/09/99		Yes
85.	Tathipudi		PRED- V	02290090 1 NAP	15/09/99		
86.	Tathipudi	HP1	PRED-H	2205	02/09/98	07/09/98	Yes
87.	Tathipudi	HP2	PRED-H	2206	02/09/98	07/09/98	Yes
88.	Tathipudi	HP Trainings Centre	PRED-H	2207	02/09/98	07/09/98	Yes
89.	Tathipudi	Reservoir	PRED-V	NAP15	14/10/98	15/10/98	
90.	Thanavaram	Gostani river	PRED-V	NAP8	14/10/98	15/10/98	
91.	Thanavaram	Middle tributary	PRED-V	NAP11	14/10/98	15/10/98	

Annexure 6: The Water Management Committee - MANISA

The establishment of community ownership and management of assets created by the project, i.e., rural water supply systems, is a fundamental objective of the APIII Pilot Project at Vizianagaram. It requires the sharing of responsibility at the level of the habitation or the water supply scheme and called for the establishment of a local body for management of RWSS assets.

The formation of the Water Management Committee involved a number of steps. Initial visits helped establish community contacts and assess the village situation. This was followed by discussions with the Sarpanch and other community elders and leaders to communicate project objectives. There was a consensus on the need to have a committee to manage water supply systems at habitation level

After due consultations at community level this water user committee became the "MANISA" (Manchi = good, Neeti = water, Sangam = Group). A date for the formal selection of members and the establishment of the MANISA was also set.

The next step was convening small group meetings within the habitation to ensure exchange of information and participation of every member of the community. The objective of this exercise was also to provide an opportunity to every section of the community to voice their opinions and to explore possibilities of inclusion of significant water and sanitation related issues in the project implementation. During this process the street representatives got selected.

On the agreed date and in the presence of the village elders, Sarpanch and the political leaders, the community reconfirmed the nomination of its street representatives to the MANISA and finalised the selection of its office bearers. The entire process took into consideration the spatial distribution of caste and class groups within the community.

The MANISA was constituted in November 1998. After a period of two years and after due consultations with the community the MANISA membership was reconstituted in November 2000. Detailed guideline for the constitution, function, responsibilities and membership the of MANISA are summarised below and further elaborated in a separate annexure.

Membership & Structure of the MANISA

Sl. No.		Term of office
Regular		
1	Every habitation/village will constitute a MANISA	2 Years
2	No. of members equivalent to the number of streets/wards/ water points (not exceeding 20)	Term of MANISA
3	Representation of all class caste groups mandatory	
4	Women representation – minimum 1/3	
Specific		
5	Operator- Mandatory for the Operator to attend all MANISA meetings	Term of appointment
Co-Option		
6	MANISA can co-opt 2 to 3 members for specific meeting/s	One meeting/s

New/ Replacement of members		
7	Decision for the enrolment of new -members, replacement of the old rests with the MANISA (same procedure to be followed)	Term of MANISA
Selection		
1	Member selection street wise - ratified in Grama Sabha	Term of MANISA
2	All the voters of the GP will become the General Body of the MANISA	
Office Bearers of the MANISA		
1	Two office bearers – President & Secretary	2 years
2	One office bearer, at least, must be a woman	"
3	Office bearers selected from among members only	"
4	Village Sarpanch will be the ex-officio Chairman	Term of MANISA
Quorum		
1	Quorum for General Body shall be 2/3 of the GP members	Term of MANISA
2	Quorum for MANISA meeting 2/3 of the MANISA members	"

Responsibilities and Functions of the MANISA

The establishment of the MANISA was followed by capacity building initiatives to ensure that they would be able to handle their responsibilities. The outcome of the workshops and training programmes resulted in the formulation of responsibilities, functions and procedures of the MANISA which are detailed below:

Management of the MANISA

Sl. No.	Functions	Means of verification
1.1	Monthly meetings to review/ transact business	Minutes book, execution of decisions
1.2	Rotation of members- responsibilities	MANISA members more responsible, effective, efficient.
1.3	Replacement of the members	Periods of vacancy, strength of membership
2.	Keeping of records	Maintenance of Minutes book, accounts, etc.
3.	Reporting on issues	Record of actions/resolutions in Minutes Book
4. 4.1 4.2	Complaints redressal /arbitration MANISA level Higher levels	Problem rectified

Management of O&M of the PWS Scheme

Sl. No.	Management Functions	Means of verification
1.	Appointment of the Operator/Mechanic and ensure effective discharge of duties	Operator/mechanic in place job cards, log books, etc.
2.	Ensure follow up of routine operation functions(as detailed in technical considerations)	Uninterrupted water supply Books of records in place
3.	Ensure regular periodical maintenance (as detailed in technical considerations)	No leaks-systematic delivery of water
4.	Ensure fault repair (as detailed in technical considerations)	Stock register of spares stock available – Operator/ MANISA
5. 5.1	Crisis Management- Interruption in power supply, absence of Operator)	Scheme restored/functional
5.2	Outbreak of epidemics	Normalcy restored
6.	Major break downs- request for service	Scheme restored linkages/system Established
7.	Commission services of other - suppliers, installation contractors, electricians, etc.	Fault rectified
8.	Replacement- Operator/mechanic	Water supply restored
9.	Monitor use & maintenance of School water tank/taps	School children have sufficient water for consumption
10.	Monitor indiscriminate drilling by other Departments	No additional water points without the consent of MANISA
11.	Regular contacts/feedback to the District officials on the village water situation	Copies of letters, travel claims
12.	Preparation & execution of Sanitation Plan	Sanitation Plan available in every MANISA
13.	Management/ disposal of the liquid/ solid waste	Visibly clean water points & village
14.	Execution of agreed upon hygiene practices	No incidences of misuse of water points, visibly clean surroundings

Supervisory and Monitoring Responsibilities:

Sl. No.	Functions	Means of verification
1.	Regular job execution by Operator/ mechanic according to TOA and JD	Operator/ mechanic found attending to their jobs
2.	Delivery of water at fixed times	Water collection visible
3.	Filling of formats - water delivery at tank, stand post level	Formats available for verification
4.	Source yield	Record of yields
5.	Electricity supply and consumption	Record of readings
6.	O & M Collection	Record of collections
7.	Sanitation Plan execution on regular basis	Visibly clean surroundings
8.	Community practices related to water collection, storage, utilization	Visible practices
9.	Proper use & protection of assets	No damaged assets
10.	Use of maintenance manual	No complaints recorded
11.	Long term monitoring - water quality, quantity, source protection, etc	More responsibility on the part of the Community / MANISA

Collection of O & M Funds- Process and Procedures

In preliminary discussions with communities, at the time of investigating suitability of habitations for future inputs from the AP-III project, it was agreed that funding for future O&M needs for RWSS schemes planned under the project would be wholly borne by local communities.

The willingness of communities to meet this precondition was obtained in these discussions, and collection of funds for O&M started as a very early activity of the MANISA.

The establishment of an O&M fund by user communities for RWSS schemes constructed by the Government did not have a precedent in Andhra Pradesh. Hence, this issue was re-emphasised at every interaction with the community to provide them with sufficient opportunity to imbibe the concept and formulate strategies for collection of funds.

In all the habitations the MANISAs were given the total responsibility of mobilising the funds. The discussion on the design of the proposed scheme included an explanation of the financial aspects of the O&M of the scheme. This gave the MANISA some clarity on the specifics of the collection necessary. In most cases while the required monthly household collection was projected to be between Rs.8 to Rs.20, it was agreed that a sum of Rs.10 for habitations with PWS schemes and Rs.5 for habitations with hand pumps per household per month would be collected.

In the absence of a nationalised bank in Anamrajapeta GP and for the purpose of maintaining uniformity, MANISAs of all habitations resolved to authorise their respective presidents and secretaries to be cosignatories to a Post Office account where O&M collections from respective habitations could be deposited.

The responsibilities of the MANISA pertaining to raising O&M funds and administration of these funds, is summarised below:

Responsibility for raising O&M Funds

Sl. No.	Functions	Means of verification
1.	O&M collection, utilisation and accounting	Deposit in the PO book of accounts
2.	Presenting Accounts to the community	Community aware of Accounts
3.	Maintain book of Accounts and get the Accounts audited as per requirement (annually)	Audited statement of Accounts available
4.	Issue of defaulters	The agreed upon O&M amount in the PO

Initially it was the intention to achieve a collection of one year's O&M contribution from beneficiary households by the time the scheme was ready to be taken over by the MANISA.

Financial Responsibilites

1. Ensuring prompt collection of agreed upon O&M costs (street wise per member)
2. Payment to the Operator/mechanic
3. Purchase of required spares
4. Payment for additional services if required
5. Maintenance of the book of Accounts
6. Presenting the income & expenditure details to the GB
7 Ensuring deposit of one year O&M amount in FD
8. Explore possibilities for mobilisation/ consolidation of finances from other sources

Reporting Responsibilities

1. Report & ensure recording in the MANISA meeting on actions taken
2. Report to the GB
3. Report to the APEX body
4. Report to concerned office

Responsibility for Promotional Activities

Sl. No.	Functions	Means of verification
1.	Ensure the display of MANISA members names	Names visible at strategic points
2.	Display of the social map & Scheme design	Social map visible to the community
3.	Paintings of messages related to health & hygiene promotion	Paintings visible at specific points
4.	Support/undertake activities to stabilise the position of MANISA	Changes visible within the community

Records to be Maintained by MANISAs

Minutes book
Post Office Pass Book
Cash book
O&M collection records
Sanitation Plans-short/long term
Operator job card
Maintenance manual
List of spare parts
Repairs/maintenance records
Complaints register
Log book-production
List of MANISA members & their detail
Hand Over Document containing Agreements, Scheme details, names of MANISA members and other relevant information

Annexure 7: Proceedings of Habitation Planning Workshop held on 21-22 January 99, Vizianagaram

Introduction:

The need for this Workshop arose because the AP III – Vizianagaram Project had reached a stage of progress, in terms of Preliminary Investigations, Hydrogeological surveys and well siting, where it was found necessary to discuss certain aspects of implementation in greater detail among PRED and NAP Office.

A number of basic parameters in the process of preparation of Habitation Plan, Water Supply Scheme Designs, O&M Plans, Sanitation designs etc. and their formulation procedures, implementation and review needed greater clarity and therefore, were the main topics for discussion in this workshop.

A detailed introductory note and agenda on the workshop is enclosed.

The Workshop was convened at the offices of the Special Project Unit, PRED, Vizianagaram. It was attended by the CE-RWS, PRED, Hyderabad, by the SE-RWS, Vizianagaram and his senior staff, by the PRED staff deputed to the SPU and by the Team Leader and all programme staff of NAP Office, Hyderabad. The Workshop followed the Agenda, covering the topics of:

Habitation Plan
Preparatory Investigations
Manisa
Sources, Design and Construction
Sanitation Plan
Implementation of Works
O&M Plan of Water Provisions
Procedures for Presenting Habitation Plan to Manisa
Activity Planning for Anamrajpet GP based on Habitation Plans

Conclusions from the Workshop:

Based on the discussions held in the workshop, following are the conclusions

Session 1 - Habitation Plan:

At the outset it was agreed that the contents of the Habitation Plan should be:

1.1 Preliminary Studies of the habitation
1.2 MANISA, formation and members
1.3 Sources and Design
1.4 Sanitation
1.5 Implementation of works
1.6 O & M Plan
1.7 M & E plan.

While it was observed that no other aspects that could be added, it was felt that modifications may be made if in the need arose in future.

Session 2 - Preparatory Investigations:

There was a detailed discussion on various preparatory investigations done so far. The following were observed made:

2.1 A more detailed sanitation and drainage survey in the habitations is necessary. Format for this need to be developed.
2.2 The need for obtaining accurate data was reiterated.
2.3 The process of gathering data and its timing was discussed and a general observation was made that frequent contacts with the community without any solid outputs reduces their (community) tolerance levels.
2.4 PRED staff would be appraised about PRA techniques through a separate workshop.

Session 3 - MANISA:

The role of PRED in facilitating the formation of MANISA began as a starting point for the session. The major outputs of this session were as follows:

3.1 The community has started accepting the presence of MANISAs in their habitations as their water management committees.
3.2 The role of women in MANISAs has been reiterated. It was accepted in this session that though at least 50% of the representatives in MANISA ideally were women and in certain cases this norm may be changed. (on a case to case basis).
3.3 A need to determine factors to motivate women to join MANISAs was also discussed and it was decided to discuss this in detail at a later stage.
3.4 There should not be delays in activities in the village in terms of technical progress and social interventions after the MANISAs are formed as they may result in "all talk and no action".
3.5 A separate workshop was proposed to discuss the roles and responsibilities of MANISAs, training of its members and its legal status.

Presentation by RNE :

Mr. Carel D.L. Brands, First Secretary, made a presentation on the drinking water supply sector policy of RNE as representative of the Government of the Netherlands with reference to recent policy positions of Government of India towards this sector. In this presentation the need for community managed systems, community participation in O&M and other aspects were reiterated. He further confirmed that this thinking of the Netherlands Government was similar to the policies of the Government of India.

The following major points were made:

1. The foreign aid content for water supply to India is at 3% of the total expenditure in this sector, of which the share of the Netherlands is approximately 0.1%
2. The emphasis in RWSS has been on decentralisation of authority.
3. It is a well-known fact that resources are scarce and hence need to be managed carefully. Fortunately, all concerned accept this fact.
4. Improvements are possible through
   - management
   - designs
   - Involvement of communities.
5. The Government of India's policy also agrees with the above and also add as their criteria for RWSS as follows:
   - Quality of delivery and not coverage as a priority
   - Low capital costs and administration
   - Maximise coverage through sector reforms
   - Capacity building of the Implementing agencies towards efficient usage of manpower and all other available resources.
   - Where strengths are lacking in implementation, augmentation may done through NGOs.
   - PRED's role is envisaged to change from a pure RWSS provider to a multi-discipline agency involving aspects of technical, social and resource management.

Session 4 - Sources, Design & Construction:

The session started with methodologies undertaken for the technical surveys in the project area. It concluded that the system adopted was satisfactory. The methodology looked further into translating this data into social surveys conducted as well as determining water needs for the project area.

Based on these discussions the following technical considerations were concluded by the workshop as norms/assumptions for designing PWS Systems in the project habitations:

4.1 The life of the water source and of the scheme shall be assumed to be at least 15 years for the purpose of design calculations.

4.2 Power supply shall be assumed available to run the scheme for 10 hours per day.

4.3 In a PWS system, wherever feasible, a medium level elevated reservoir (MLSR) shall be proposed with staging suitable to provide a residual head delivery head of between 3 metres to 5 metres at exit points.

4.4 There shall be sub-reservoirs as service points, if necessary.

4.5 Population growth shall take into consideration the actual growth of population in the GP/ village since the last Census (1991), as determined by the actual household survey conducted. This growth rate shall be annualised for computation of the population at the end of the design period, i.e., fifteen years.

4.6 Existing schemes shall be renovated and shall continue to be used to meet part of the total water demand. Hence it would not be necessary for the new

schemes to meet the total projected demand. As a guideline, new schemes should be designed to a delivery level of 40 lpcd.

4.7 PSPs/ water point outlets shall be constructed at the rate of 1 outlet for a population of 150 to 180 persons, in order to increase user convenience and improve Service Level.

Session 5 - Sanitation Plan:

5.1 The need to look into the study of the drainage system, as part of the preliminary investigations was re- emphasised.

5.2 As part of the surveys the natural drainage path must be determined.

5.3 The village plan must carry a sanitation plan and the following aspects must be dealt with :

- 5.3.1 Upkeep of exit points
- 5.3.2 Source Protection
- 5.3.3 Organisation of waste disposal
- 5.3.4 O & M of Drains
- 5.3.5 Hygiene promotion

5.4 The sanitation and drainage systems must be completed before the monsoons.

5.5 PRED/SPU shall identify an expert within their department to advise them about sanitation and drainage.

5.6 A technical workshop on sanitation will be held for the SPU staff before the second week of February to decide on designs etc.

Session 6 - Implementation of Works:

The emphasis of this session broadly touched upon the following main topics:

6.1 Role of MANISA/PRED in the implementation of works:

- 6.1.1 As MANISA's expertise in implementation is not proven, being initiation phase, it was generally agreed that they should be given the monitoring responsibility of the scheme and to periodically review the construction.
- 6.1.2 The contractors however will be requested to use local resources as much as possible to encourage involvement of the community.
- 6.1.3 However, as the project progresses work entrustment norms may change.

6.2 Work entrustment shall be done through the normal PRED procedures of tendering etc.

6.3 As stated by RNE in its presentation certain non-conventional methods of construction, in terms of materials and manpower, may be adopted for economic and innovative usage.

Session 7 - O&M Plan of Water Provisions:

It was concluded in this workshop that, O&M plan is an absolute essential feature of the village plan. The general points discussed were:

7.1 Tasks of MANISA/PRED
7.2 Timing for presentation of plan to the community
7.3 Generation of O&M finance and mode of collection of payments.
7.4 Monitoring and Evaluation to community and PRED on
- water delivery
- Sanitary conditions
- Financial accountability

It was resolved that there are so many aspects that needs to be incorporated into this plan that PRED-SPU in consultation with NAPO will by way of a separate workshop will resolve these issues and present a draft plan.

Agenda: SPU - NAPO Workshop: Habitation Plan, Vizianagaram
21 & 22 January 1999

Introduction

As the Hydrogeological section of the project is nearing the completion of making sources for the RWSS available in Anamrajpet GP of Jami Mandal, we are approaching the next phase and tasks of preparing designs, developing O&M plans, sanitation plans, consolidating the MANISAs and drafting the Habitation Plans for approval by the Community, PRED, NAPO and also The Royal Netherlands Embassy.

Meanwhile the necessary finance has also been made available for the project, and we would like to enter the New Year with this workshop to boost activities in the project. The content of this workshop starts with referring to the basic principles of the project, as laid down in the key- features in the AP-III document and the one-year proposal for the initiation phase in Vizianagaram.

These will be related to the policies of The Netherlands Government and the Government of India in a presentation made by The Netherlands Embassy.

The workshop will then continue on the basis of the perceived Habitation Plan and its components and aim to reach a consensus on the modalities related to these issues.

The latter part of the workshop will try to specify the planning of the various activities, enabling us proceed with the formulation of draft Habitation Plans for Annamrajpet GP Jami Mandal and present these to the communities for finalization and approval.

All sessions except for Sessions 8 and 9 will be facilitated by M. Jayaram. This will allow the specialists on the various professional issues to play their role as full participants in the meetings.

Sessions 8 and 9 (Procedures for presenting the Habitation Plan and Activity Planning) will be chaired by the CE - RWS.

The workshop aims to reach clear conclusions and consensus to help us proceed towards the implementation.

We are all requested to make an effort in effective constructive discussions, sticking to the point at hand to help the facilitator handle the multitude of topics efficiently in the allocated time. The workshop programme is enclosed.

Workshop Programme

Thursday 21 Jan 1999

9.00 hrs: (35 minutes)

5 Minutes	Welcome by PRED
10 Minutes	Introduction of participants.
10 Minutes	Present status of project activities (SPU).
10 Minutes	Introduction to the workshop (Teamleader NAPO).

9.45 Hrs:

Session-1: (10 minutes) - Habitation Plan: Introduction by M. Jayaram

1.1 Preparatory investigations, social & technical surveys, habitation profile
1.2 MANISA.
1.3 Sources and Design.
1.4 Sanitation.
1.5 Implementation of works.
1.6 Operation & Maintenance Plan.
1.7 Monitoring & Evaluation

Session 2: (20 minutes) - Preparatory Investigations: Introduction by Raj Kumar Daw

2.1 Social survey, specifying demographic data, infra-structure, social map, habitation lay-out, water demand.
2.2 Technical survey, existing water sources and facilities, and additional requirements.
2.3 Hydrogeological investigations, specifying quantity and quality of existing sources and required additional sources

10.30 Hrs: Coffee break

10.45 Hrs:

Session 3: (60 minutes) - MANISA: Introduction by Anu Sharat

3.1 Formation
3.2 Composition
3.3 Task description and responsibilities
3.4 Rules and regulations and formal position of the MANISA
3.5 Training programmes

12.00 Hrs: Lunch break

14.00 Hrs: (40 minutes)

RNE: Presentation of Policy Positions on RWSS- of the Govt. of Netherlands and Govt. of India

Session 4: (120 minutes) - Sources, Design & Construction: Introduction by Raj Kumar Daw

4.1 Surveys; water demand/ civil surveys
4.2 Identified sources and their use
4.3 Alternative options for design and construction :
Materials
Distribution and Storage
Physical specifics on exit points.

17.30 Hrs: Inauguration of SPU - NAP Office

18.00 Hrs: Informal get-together PRED-SPU Staff, RNE and NAPO
At NAPO Guesthouse, followed by dinner.

Friday 22 January 1999

9.00 Hrs:

Session 5: (90 minutes) - Sanitation Plan: Introduction by Anu Sharat

5.1 Assessment of drainage requirements in view of RWS Design and existing sources.
5.2 Implementation of sanitation works
5.3 O&M of drains
5.4 Plan of improvement of habitation sanitary conditions:
-Upkeep of exit points
-Source protection
-Organization of waste disposal
-Hygiene promotion

10.30 Hrs: Coffee break.

10.45 Hrs:

Session 6: (60 minutes) - Implementation of Works: Introduction by Raj Kumar Daw

6.1 Role of PRED and MANISA in implementation of works.
6.2 Entrustment of works.

11.45 Hrs:

Session 7: (75 minutes) - O&M Plan of Water Provisions: Introduction by Raj Kumar Daw

7.1 Listing of tasks (PRED/MANISA)
7.2 O&M manual
7.3 Financial estimates / Budget
7.4 Generation of O&M finance/ mode of collection of payments
7.5 Internal Monitoring and evaluation: to community and PRED on:
-Water delivery
-Sanitary conditions
-Financial accountability

13.00 Hrs: Lunch break

14.00 Hrs:

Session 8: (60 minutes) - Procedures For Presenting The Habitation Plan to the MANISA and the community: (Chaired by CE RWS)

8.1 Meeting with MANISA at Field Office (by SPU)
Presentation and explanation of suggested habitation plan to MANISA
Questions raised by MANISA and open floor discussion
Preliminary consensus MANISA, PRED, NAPO
8.2 MANISA's presentation of habitation plan to Community (Gram Sabha) with assistance of SPU and NAPO.
Questions raised by the Community.
Consensus Community, MANISA, PRED, NAPO
8.3 Formal Agreement MANISA, PRED, NAPO
8.4 Preparation Marginal Appraisal Form
8.5 Approval of RNE

15.00 Hrs: Coffee break

15.15 Hrs:

Session 9: (90 minutes) - Chaired by CE - RWS

Activity Planning for the Anamrajapet GP Habitation Plans, based on the understanding of the workshop discussions:
9.1 Listing and assigning of tasks
9.2 Revision of Time frames

Annexure 8: Water Demand Assessment in Jami Mandal

Sl. No.	Habitation	Demography – Current & Projected			Water Needs – Current & Projected				Source Capacity		
		Households	Population		Litres/ capita/ day		Liters per day - LPD		1.2*LPD/10 = LPH	LPM (LPH/60)	Proposed Scheme
		1998	*1998*	*2013*	*1998*	*2013*	*1998*	*2008*			
Main Habitations											
1	Anamrajapeta	52	245	270	47	40	11417	10800	1296	22	Joint PWS
2	Jaggaipeta	251	1343	1480	51	40	68359	59200	7104	118	
3	Seethanagaram	188	873	962	48	40	41991	38480	4618	77	PWS
4	Pushpagiri	66	290	320	61	40	17777	12800	1536	26	PWS
5	Harijanwada	62	209	230	52	40	10764	9200	1104	18	PWS
Sub- Habitations											
6	Cheruvulopala	30	140	154	67	40	9310	6160	739	12	HP
7	Kanakalavari Kallalu	13	92	101	59	40	5465	4040	485	8	HP
8	Dibbagudibadi	7	34	37	212	40	7215	1480	178	3	HP
9	Pathetibadi	13	63	69	67	40	4196	2760	331	6	HP
10	Vedurlapatti	12	73	80	58	40	4212	3200	384	6	HP
11	Chellurivari Kallalu	15	76	84	66	40	5039	3360	403	7	HP
12	Hamzevari Kallalu		10	11	151	40	1513	440	53	1	HP
13	Avanapuvari Kallalu	4	40	44	62	40	2484	1760	211	4	HP
14	Musirikadabadi	9	35		62	40	4533	3200	384	6	HP
15	Gummidibba Kallau	6	23		62	40	2422	1720	206	3	HP
16	Bangarammagudi	3	15		62	40	2422	1720	206	3	HP

Notes:
Annual Population Growth Rate is computed at 0.65% based upon 1991 census pop. of GP.
This Growth Rate projection does not apply to Habitation Sl. Nos. 14 -16, which were later taken into the GP's overall water supply considerations.
Supply Rate in 1998 is on the basis of the assessment of the Household Survey, which accounts for ALL water needs. In comparison, the proposed schemes plan to supply only at the rate of 40 lpcd, projected upto 2013, and meet on PART of the total water needs.
Source Capacity is calculated on the basis of the demand in 2013, adding 20% towards losses and assuming power supply for 10 hrs. per day computations are made.

Water Demand Assessment in Gantyada Mandal

Parameter	Chandram-peta	Chinna Madhupada	Chinna Manapuram	Ginjeru	Korlam	Pedda Madupada	Pensam	Tathipudi
Demography								
Population in 1991 (Census)	1062	351	880	1502	2662	1877	1622	462
Population in 1998 (HH Survey)	1259	436	917	1480	2777	2331	1673	518
Growth Rate: % per Year	1.582	1.582	1.582	1.582	1.582	1.582	1.582	1.582
Population in 2013	1593	552	1160	1873	3514	2950	2117	656
Nos. of Household in 1998	209	75	201	306	604	522	326	128
Status of Water Supply in 1998								
Nos. HP in 1998	5	1	5	8	8	5	6	2
Population per HP	252	436	183	185	347	466	279	259
PWS Source Requirements in 2013								
Current Demand (HH Survey) - lpcd	50	92	58	59	42	79	83	70
Proposed PWS Service Level - lpcd	40	40	40	40	40	40	40	40
Source Yield: LPD (1.2 x lpcd x pop 2013)	76464	26496	55680	89904	168672	141600	101616	31488
SourceYield Requd: LPD/10 x 60)	127	44	93	150	281	236	169	52
Storage: Litres (50% of Requd. Yield – LPD)	38232	13248	27840	44952	84336	70800	50808	15744
Supply Rate: LPM (Requd. Yield-LPD/ 8 x 60)	159	55	116	187	351	295	212	66

Notes:
Population 1991 represents the Census population figures. Population 1998 represents figures of actual population found during Village and Household Surveys. Decadal population growth rate is assumed as 17% (from Census, for Vizianagaram Dist.), which converts to 1.582% per year. Population of Madhupada (Chinna+Pedda) is available for 1991 and available separately for 1998. For computation of the growth rate, 1991 population has been divided in the proportion of the population found in 1998.

Annexure 9: Sanitation Plan Format

Habitation Name:..... Date:.....

Sl. No.	Problems / Issues		Person responsible for Street	MANISA member responsible	End date for activity	Issues/ Remarks
	Present problems	Future course of action				

Annexure 10: O & M Collection and Monitoring Forms

Format for Receipt Book

RECEIPT		RECEIPT	
No:	Date:	No:	Date:
Netherlands Assisted Project (AP-III)		**Netherlands Assisted Project (AP-III)**	
MANISA: .....(Village/Habitation) .....(Mandal), Dist.Vizianagaram		**MANISA:** .....(Village/Habitation) .....(Mandal), Dist.Vizianagaram	
Received from Sri/Smt:		Received from Sri/Smt:	
Father/Husband's Name:		Father/Husband's Name:	
Towards O & M contribution for the month of: .....(Month/Year)		Towards O & M contribution for the month of: .....(Month/Year)	
Rs. ..... (Rupees .....only)		Rs..... (Rupees .....only)	
Payee's Signature:		MANISA Seal	Receiver's Signature: .....
Receiver's Name:			Designation: .....

Let's pay O & M regularly - Let's protect our scheme

Members Collection Book

Habitation:
Name of O & M Collector:

Sl. No.	Date	Name of Head of Household	Month	Receipt No.	Amount - Rs.
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					
				Total	

Rupees: .....

Signature: .....(President/ Secretary)

Monthly O & M Collection Book

Habitation: ..... Year: 200....

Card No:	Head of the Household	January		February		March		April		May		June		July		August		September		October		November		December	
		R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt	R.No:	Amt
Total																									

Annexure 11: Tripartite Agreement

Resolution of Agreement for Acceptance of Design/ Estimates and Operation & Maintenance of Schemes

We the members of MANISA of ..... (habitation name) representing our habitation in ..... GP of ..... Mandal do hereby state the following on this ..... (day) of ..... (month) ..... 2001.

1. Whereas the Panchayat Raj Engineering Department, Vizianagaram has provided us a scheme for drinking water supply and drainage system in our habitation with assistance from Government of Netherlands.
2. And whereas as prerequisite for the construction of the scheme we had agreed to the acceptance of the scheme designs and its further Operations & Maintenance as per our resolution dated .....
3. And whereas the Panchayat Raj Engineering Department on ..... (date) has constructed the scheme and presented to us construction costs and costs for continued operations and maintenance as per the hand over document enclosed.

We hereby resolve the following:

1. The proposed scheme for drinking water supply, drainage and sanitation, in its designs and estimates in implementation are acceptable to us.
2. We are willing to take responsibility as custodians and owners for the scheme.
3. We further agree to take up the operations and maintenance (O&M) of this scheme, after the scheme has been handed over to us, in terms of financial costs, proper maintenance as per details and plans finalized by the Panchayat Raj Engineering Department, Vizianagaram.
4. We hereby accept the hand over document which gives details of the scheme, costs, roles and duties of MANISA and other relevant details as part of our take over of the scheme.

We hereby affix our signatures indicating our approval as follows:

1.
2.
3.
4.
5.
6.
7.
8.

Witnessed by:

1. Sarpanch

2. Executive Engineer, PRED

3. Representative, NAP Office

Annexure 12: Progress Report

PROGRESS REPORT AS ON 31/3/2001
GANTYADA MANDAL

Sl. No	Name of the Scheme	Pump House	Pumpset	Power Supply	Pumping Main		MLSR					
					Target (m)	Comp. (m)	1	2	3	4	5	6
0												
1	PWSS to Chandrampeta	Completed	Erected	Power supply given	750	Completed	Completed	Completed	Completed	Completed	Completed	Completed
2	PWSS to Chinamanapuram	Completed	Erected	Power supply given	300	Completed	Completed	Completed	Completed	Completed	---	---
3	PWSS to Thatipudi	Completed	Erected	Power supply given	190	Completed	Completed	Completed	---	---	---	---
4	PWSS to Ginjeru	Completed	Erected	Power supply given	470	Completed	---	---	---	---	---	---
5	PWSS to Penasam	Completed	Erected	Power supply given	1005	Completed	---	---	---	---	---	---
6	PWSS to Pedamadhupada	Completed	Erected	Power supply given	nil	nil	---	---	---	---	---	---
					(Pumping main completed by R.W.S.division under A.S.C. grant)							
				(Pumpset was also erected by R.W.S.division for giving water under direct pumping)								
7	PWSS to Chinamadhupada	Completed	Erected	Power supply given	327	Completed	Completed	Completed	---	---	---	---
8	PWSS to Korlam	Completed	Erected	Power supply given	832	Completed	---	---	---	---	---	---

Name of the Scheme	OHSR/GLSR	Distribution		Drainage		BW & OW Renovation		Public Stand Posts		Remarks
		Target (m)	Comp. (m)	Target (m)	Comp. (m)	Target (Nos.)	Comp. (Nos.)	Target (Nos.)	Comp. (Nos.)	
PWSS to Chandrampeta	---	418	418	284	284	5	Nil	12	12	
PWSS to Chinamanaouram	---	600	600	350	325	4	1	9	9	
PWSS to Thatipudi	---	150	150	300	300	Nil	Nil	5	5	
PWSS to Ginjeru	GLSR complete	1430	1430	597	597	9	2	12	12	Renovation not necessary for other Bore wells and Open wells
PWSS to Penasam	OHSR complete	1066	Completed	600	600	4	NIL	15	15	
PWSS to Pedamadhupada	OHSR complete	1155	Completed	850	1050	NIL	NIL	15	15	Drainage length increased during execution.
PWSS to Chinamadhupada	---	191	Completed	125	125	NIL	NIL	5	5	
PWSS to Koriam	OHSR complete	2316	Completed	1000	1000	3	NIL	28	32	Extra PSP's were constructed cosidering the request of MANSA at locations were necessity is felt and renovation of Open wells and Borewells not necessary.

Note: Water released in all the villages of Gantyada mandal

EXECUTIVE ENGINEER
R.W.S. (Projects) Vizianagaram.

Annexure 13: Completion Report

COMPLETION REPORT
GENERAL ABSTRACT
NAME OF THE WORK: PWS SCHEME TO ANNAMRAJUPETA/JAGGAYYAPETA

S.NO	DESCRIPTION OF WORK	WORKING ESTIMATE	AS PER BILL	EXCESS	LESS	REMARKS
1	Construction of 7" dia scheme bore well using 7" MS blanks/slotted casing pipe including remming, well development,gravel packing, yeild testing etc., complete with combination rig.	50,131	50,131.00	---	0	---
2	Construction of pump house of size 2.5x1.8m	34,600	33,937.74	---		
3	Construction of Medium level service reserviours of following capacities			---		
	a) 7000 liters MLSR - 1	105000	104.757.14	---		
	b) 4000 liters MLSR - 2	90500	89,198.64	---		
	c) 8000 liters MLSR - 3	104000	103,209.28	---		
	d) 7000 liters MLSR - 4	104000	102,859.80	---		
	e) 5000 liters MLSR - 5	90000	89,141.21	---		
	f) 9000 liters MLSR - 6	112000	111,583.64	0		
4	Pumping main	100000	96,163.14	---		
5	Distribution system	80000	73,325.20			
6	Drainage system to PSP's	215000	207,229.25			
7	Provision towards Geological survey	---	---	---	---	---
8	Cost of Pumpset	47,663	33,030.00	---	14,633.00	Three phase 3HPpump procured was replaced with single phase 2PH pump due to eraction of single phase transformer by the APTRANSCO. The 3HP pumpset was transferred to aNAP sub division-II, Gantyada mandal.
9	Provision towards electric charges	64,020	64,020.00	0	---	---
10	Provision towards PS AND T&P charges (4% of the Estimate Cost)	64,000	---	---	64,000	
11	Other contengencies (Turn over tax, insurance etc)					
	Provision towards turn over tax3%on contract value	27660	27,457.26	---	202.74	
	Provision towards insurance at0.1%on contract value	922	---	---	922.00	
	Provision for construction of Temporary shed	1000	---	---	1000.00	
	Provision for Technical persons	9000	---	---	9000.00	
12	Provision towards unforseen items	300,504	---	---	300,504.00	
	TOTAL	1,600,000	1,186,043.30	0	413,956.70	

Signed By: Executive Engineer
R.W.S.(project) Vizianagaram

Asst.Executive Engineer
NAP/RWS(Projects),Vizianagaram

Annexure 14: Capacity Building

Training Programs and Workshops convened during 1997 - 2001

At Hyderabad

1. Programs for PRED

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
1.1.1	Workshop on project formulation and strategy - AP III, Vizianagaram	To work out the strategies for operationalisation of APIII, Vizianagaram	July, 98	PRED (HQ) and NAPO	Clear-cut strategies for implementation agreed upon
1.1.2	Workshop on formalisation of Water Management Committees	To learn from the experience of similar projects on the issues of scheme handover and community management.	Mar, 99	PRED, Gogha - Gujarat, Kerala, WB & DANIDA - Karnataka, Dutch Projects in AP, NAP	• Conceptual clarity on a number of specifics • Clarity on requirements for AP
1.1.3	Workshop- HIS	To train the PRED - Hydrogeological wing on the use of ILWIS package To explore the scope of the Hydrogeological Information Systems program	Oct, 2000	PRED, SGWD, RD Dept & NAPO	• Clarity on the usage of the package • Effective use of the programme for data compilation

2. Programs for NGOs

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
2.1.1	Workshop on Project Planning Matrix for NGO component – APIII	• To brainstorm on the plan/proposal submitted by NGOs for new villages - APIII • To construct Project Planning Matrix	Apr, 98	NGOs involved in APIII and NAPO	• Qualitative and quantitative outcomes clearly spelt out • Indicators and required assistance from NAPO & other agencies, formulated
2.1.2	Consultative Workshop with NGO's	• To identify common interests in promoting sustainability of A.P.III Programme. • To develop action plan for synergistic efforts.	Mar,01	NGO's working in the A.P.III Project area.	

3. *Gender Networking Workshops*

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
3.1.1	Gender Networking Workshop II	Gender Impact Assessment	Feb,99	Netherlands Assisted Projects in AP and Karnataka	• Project specific indicators • Development of Project specific methods for impact assessment
	Gender Networking Workshop V		Dec,00	Social Desk Staff of NAP Office	

4. Programs for NAPO

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
4.1.1	Team up software for elaborating logical framework	To explore possibilities of use of logical framework approach in the NAP RWSS program	Nov, 97	NAP Staff	Effective use of logical framework approach
4.1.2	HP –Training	To familiarise the NAP staff on the types, functioning and other details of the HP	Feb, 98	NAP Staff	• Enhanced understanding about the functioning of the hand pump • Ability to effectively monitor hand pump related issues in the field
4.1.3	Training on the use of computers – specifically Corel Draw software	To use computers effectively, specifically Corel Draw software	Dec, 98	NAP Staff	Staff are confidant of handling the computers independently
4.1.4	Workshop- Sharing of experiences Gram Vikas, Orissa	To explore possibilities for replication of the approach, specifically related to community contribution and pricing of water	Dec, 2000	NAP Staff	• Conceptual clarity on probable strategies • Clarity on specifics for future planning
4.1.5	Exposure visit of Dutch supported *DWSS program partners from India* to The Netherlands	To familiarise participants with the water supply *trends in The Netherlands*	Oct, 98	NAP Staff	Enhanced understanding of water supply utilities, NGOs, consultants operating in the field of water supply
4.1.6	Workshop – The enhanced role of resource centres in capacity building	Consultation on the establishment of international resource centres	June, 98	NAP Staff	Strategy for establishment of international resource centres with *Dutch Assistance*
4.1.7	Workshop on writing and presenting better reports	To enhance Participants Skills in making better reports	May,00	SPO & TPO of NAPO	Demonstrated skills in developing better reports

At Vizianagaram

5.1 Programs for SPU

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
5.1.1	Workshop to finalise the selection of Mandals – AP III, Vizianagaram	To finalise the list of Mandals/Villages/ Habitations	Aug, 98	PRED- RWS & NAP Staff	Final list of Habitations /Villages/ Mandals agreed upon
5.1.2	Training on operation of pumping test equipment and conducting yield test	Establishment of sustainable yield of source	Sept, 98	SPU - PRED	Operationalising of the PT unit of the PRED and establishing the field procedures for conducting yield tests
5.1.3	Orientation Workshop –I	• To assess envisaged mechanisms for CP • To list roles, functions and position of WMC • To address the issue of sanitation thematically and practically	Oct, 98	PRED- RWS, SPA & NAP Staff	• Clarity on the concept of CP • Emergence of the name MANISA • Pricing of water to be uniform • Sanitation to be an integral part of the program
5.1.4	Orientation training on Hydrogeological software (ILWIS)	To orient the Hydrogeologist / SPU staff on the use of ILWIS package	Nov, 98	Hydrogeologist and SPU Staff	The Hydrogeologist is confident of handling the package.
5.1.5	Habitation Planning Workshop	• Deliberate on the habitation plan • Deliberate implementation specifics	Jan , 99	RNE, PRED, SPU, NAPO	• Listing of the project specifics • Plan of action and responsibility sharing agreed upon
5.1.6	Orientation Training on computers	To orient the SPU staff on the basics of computers: (a) Corel Draw and (b) AutoCAD	Jan, 99	PRED-SPU	The SPU staff are confident of using various software especially for designing and drawing.
5.1.7	Roles &Responsibilities of MANISA	To generate &arrive at a common list of Role and Responsibilities of the MANISA, with inputs from MANISA & SPU	Feb, 2000	PRED-SPU, MANISA	The proceedings of the workshop will be available as a working document
5.1.8	Calibration of completed PWS schemes	Establishment of performance parameters/bench mark for completed PWS schemes	Jan, 2001	SPU - PRED	• Performance calibration of schemes *wrt* design, establishment of operating procedures • Orientation of SPU personnel and scheme operators in operational sequence & records

5.2 Programs for Community Organisers

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
5.2.1	Orientation Training for the Cos	• To orient the newly appointed COs on the project objectives • To explain the roles and responsibilities of the COs and work out the action plan	Dec. 98	COs	The COs have clarity on their roles and responsibilities in the context of the project objectives
5.2.2	Training on the techniques of PRA, Social mapping and Water Needs Analysis	To orient the COs to the techniques of PRA, Social mapping and WNA	Jan - March 99	COs, Village leaders	• Clarity on participatory approaches and its applications • Ability to independently handle the exercises
5.2.3	Orientation Training on the development of village profiles	• To develop the village profile • To work out the strategies for data collection	Mar, 99	COs, Village leader	Clarity on the specifics in data collection
5.2.4	How to conduct a socio-economic survey	• Establish relevance of the socio-economic survey • Elaborate on the methodology of the surveys	Oct. 99	COs, Enumerators	The COs develop improved understanding and gain confidence to undertake the surveys
5.2.5	Practical exposure to the geological survey	Help the participants gain an understanding on the need and methodology of the geological survey	Nov. 99	AEEs, COs, SPA	Clarity on methodology of conducting survey
5.2.6	Orientation to San-plan	To orient the COs on the need for the san-plan and its execution	Sept, 2000	COs, SPA, AEEs	Understanding about the San-plan and its execution
5.2.7	COs participated along with the MANISAs/ Hand Pump Mechanics/ Scheme Operators in various training programs	Details of themes and contents are available separately	Nov, 98 - Oct, 2000	COs and SPU staff	COs should have improved understanding of their responsibilities on the various issues related to HP mechanics MANISAs & the community
5.2.8	MANISA meetings and record maintenance	• To reiterate the need for systematic meetings by the MANISA • To reinforce the importance of record keeping	Nov, 2000	SPU, staff	• Clarity on the importance of MANISA meetings & records • Enhanced ability to explain the same to the MANISA / community
5.2.9	O & M Collection strategies	• To arrive at feasible options for enhanced O&M Collection • To chalk out a work plan	Dec, 2000	SPU, staff	Specific strategies discussed & agreed upon

5.2 Programs for Community Organisers (contd.)

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
5.2.10	Usage of monitoring formats	• To impress upon the COs the need for monitoring • To structure the monitoring exercise	Dec, 2000	SPU, staff	The COs have copies of agreed upon monitoring formats for various issues
5.2.11	Participatory approaches	• Reorientation of the COs on participatory approaches • Prepare a strategy / plan of action with improved CP as the focus	Dec, 2000	COs, SPA and AEEs	• COs have improved understanding of the participatory approaches • Action / strategy plan agreed upon
5.2.12	Orientation to development approaches	To expose the COs to the various development approaches in the different development sectors and relate it to RWSS	Dec, 2000	SPU, staff	The COs have a broader perspective of development initiatives and will be able to relate it to RWSS specifically
5.2.13	Chlorinating process	To educate the COs on the need for chlorinating and methods involved	Jan, 2001	COs	COs have clarity on the use of chlorine

At Mandal level

5.3. Programs for MANISA

Sl. No	Title of Training/ Workshop	Theme/Objectives	Month	Participants	Outcomes
5.3.1	Orientation training to the MANISA members	• To orient the newly selected MANISA members on the project objectives • Illustrate on their tasks in relation to the program	Oct, 99	MANISA members - 2 Mandals	To orient the newly selected MANISA members on the project objectives
5.3.2	Roles & Responsibilities of MANISA	To generate & arrive at a common list of Roles and Responsibilities of the MANISAs	Jan , 2000	PRED-SPU MANISAs	The proceedings of the workshop will become the future working document
5.3.3.	Training on health & hygiene for women	To create awareness among women of safe drinking water, health and hygiene aspects	April, 2000	MANISAs and women -	Better understanding on safe water, personal/domestic hygiene and role of women in promotion
5.3.4.	Workshop on management and maintenance of scheme	To establish importance of O&M. Review procedures for collection	May, 2000	PRED-SPU, MANISAs	Clarity on social, preventive aspects of the scheme. Streamlining O&M collection
5.3.5.	Workshop on sustainability and withdrawal strategy	• To develop conceptual clarity on sustainability of project. • To review procedures for collection and recording	May, 2000	PRED-SPU, MANISA	MANISA clear of its role in collection of O&M and scheme management
5.3.6	Reorientation training for MANISA	• To reorient the newly selected MANISA members on the project objectives. • To recapitulate project progress and plan for future involvement.	Oct, 2000	DC, RDO, PRED-SPU, MANISA	• Demand from MANISA for total control of water sources. • Mainstreaming O&M collection.
5.3.7	Consultative Workshop of Sarpanches and MANISA Office Bearers	• To develop coordination and plan of action among Panchayats and MANISAs. • To review document on Roles and Responsibilities of MANISA and develop a final document. • To review the status of target one year O&M collection and plan for achieving the same.	February 2001	DC, EE, AEEs, SPA, COs, NAP staff, Sarpanches, MANISA office bearers.	• Understanding and agreement on areas of improved co-ordination among Panchayat and MANISA • Review and further development of Document on MANISA roles and responsibilities. • Plan of action in meeting target one year O&M collection.
5.3.8	Training on Accountancy and Book keeping for MANISAs	• To develop skills among MANISA members on managing their books of accounts .	March - April 2001	SPA, COs, MANISA members	• Demonstrated skills in managing their books of accounts

5.4. Programs for Operators & Mechanics

Sl. No	Title of Training/Workshop	Theme/Objectives	Month	Participants	Outcomes
5.4.1	Training for HP Mechanics- I	To train HP mechanics to undertake repairs of the bore wells	Nov, 99	H P mechanics	Trainees confidant of attending repairs of HPs and confident of obtaining spares
5.4.2	Training for HP Mechanics- II	• To recapitulate earlier training inputs • To explore and provide additional inputs	April, 2000	H P mechanics	The H P mechanics are better equipped to identify trouble and rectify the same
5.4.3	Training on operation &maintenance of the PWS scheme	To enable the identified operators to maintain the PWS scheme in their jurisdiction	April, 2000	Scheme Operators	Functional clarity on the operation of the scheme
5.4.4	Training on operation &maintenance of the PWS scheme to Scheme operators	To build capacities of Scheme operators to maintain the PWS scheme by attending to trouble shooting, preventive maintenance etc, at their village level itself	April, 2001	Scheme Operators of 12 schemes	Functional clarity on the operation of the scheme especially repairs, trouble shooting and preventive maintenance

Annexure 15: O & M Rsponsibilities

O&M of Schemes - Technical Functions, Frequencies, Levels and Types of Duties & Responsibilities:

The following tables on O&M are limited to technical considerations only of Operations and Maintenance of PWS Schemes by MANISAs (and only touches upon Managerial functions) under three main categories - namely Routine Operation, Routine Maintenance and Fault Repair.

Nature of O & M	Specific Function	Frequency	Level & Type of Responsibility		External Monitoring/. Service Providers
			Operator	MANISA Representatives	
Routine Operation					
Supply of Water	Turning pump On/Off	Daily	Yes	Ensuring timing	
	Opening/Closing Valves to reservoirs for filling	"	"	Ensuring filling	
	Verify delivery of water at all PSPs	"	"	Random checks of delivery of water at PSPs	Compilation of Log Book Data
Preventive Maintenance	Check for visible damages/malfunction of system-leaks, functioning of taps/ valves, etc.	"	Immediate reporting, repair (where possible), recording	Facilitating repair, ensuring recording in Maintenance Register at all stages.	Random discussions with users
Record keeping	Writing log book for daily records	"	"	Completion of log book & verification	Verification of records, Analysis of information
	Recording of all significant events of Routine Maintenance and Fault Repair	"	Yes, in the form of a daily entry in the Maintenance Register and Job Cards	Supervision of entries in Maintenance Register and Job Cards. Counter signatory. Safekeeping of records. Handover to next nominated member.	

Nature of O & M	Specific Function	Frequency	Level & Type of Responsibility		External Monitoring/. Service Providers
			Operator	MANISA Representatives	
Periodical Maintenance					
Source Protection	Maintain Sanitary conditions	Daily	Yes	Weekly (Random) Check	
	Observe Pump for smooth operation	Daily	Yes	"	
	Chlorination of source	Post-monsoon (October) and other special occasions	Yes	Ensure, by being present	
	Water level recording	Pre-monsoon (May/ June), Post-monsoon (October)	Yes	"	
Electrical System	Replacement of fuses, Turning on MCBs, indicator bulbs	As required	Yes	Ensuring recording in Maintenance Register at all stages (listed below)	
	Checking for overheated contacts, burnt insulation, cleaning cable ends	Weekly and more often if required	Yes	Supervising repairs by Operator/ external electrician	
	Ensuring tightness of connections at terminals	Monthly	Yes	"	
	Reconditioning/ replacement of contact terminals	As recommended by supplier	No	Call for outside service	
	Malfunction of other instruments - Voltmeter, Ammeter		Verification of problem & reporting	"	

Nature of O & M	Specific Function	Frequency	Level & Type of Responsibility		External Monitoring/. Service Providers
			Operator	MANISA Representatives	
Periodical Maintenance (Contd.)					
Structural Repair	Masonry repairs to Pump Houses, Reservoirs, Valve Pits, Covers, PSPs, Drains, etc., Painting	Ad-hoc, at least annually	Verification of problem & reporting	Engaging local artisans for repairs, supervision of completion	
Pipeline - Pumping Main	Leakage check	Daily	Visual verification while system filling	Verification by random checks, user complaints. Actual verification of specific complaint by arranging excavation. Calling external services	Monitoring by comparison of filling rates times. Repair services
	Chlorination	Post-monsoon (October) as a part of source chlorination. Also after major pipe repairs, at least Down-stream line.	Yes	Verification by being present. Supervision, engagement of additional labour	
Reservoirs - MLSRs	Cleaning & chlorination	Definitely -Post-monsoon (October) as a part of source chlorination. Also, once in 3 months	Yes	Supervision, engagement of additional labour	
Pipeline - Distribution System	Leakage check	Same as in the case of Pumping Main			
	Chlorination	Same as in the case of Pumping Main & Reservoir			
Public Stand Posts	Cleaning of Platform	Weekly/ Part of Sanitation Plan	Supervision and arranging for resources		
	Maintaining sanitary conditions	Daily	Interaction with users		
		Periodically, filling earth around PSPs to reduce damp area	Supervision and arranging for resources soil and its transport		
Drains	Maintaining sanitary conditions	Weekly/ Part of Sanitation Plan			
Water Quality Tests	Drawing water samples	Pre monsoon (May-June) & Post monsoon (October)	Yes, drawing samples at source & PSPs	Supervision of sampling, making bottles available, despatch to WQ Lab.	Analysis at Distt. Lab. Providing results and recommendations

Nature of O & M	Specific Function/ Problem	Frequency	Level & Type of Responsibility		External Monitoring/. Service Providers
			Operator	MANISA Representatives	
Fault Repair					
	No power (unexpected/ prolonged cut-off)			Complaint	
	Low discharge from Source		Diagnosis & verification. Reporting to MANISA representative Undertaking repairs where possible	Obtaining confirmation of problem and engaging external services	Rehabilitation/ new source creation
	No discharge from source				
	Pump Not Working				Pump repair
	Pipeline leakage - Pumping Main			Above + arranging excavation, temporary measures for reducing leakage, engaging external services	Pipe line repair
	Valve malfunction at Reservoir Inlet line			Obtaining confirmation of problem. Where Operator can undertake repair, providing resources. Otherwise, engaging external services	Provide appropriate service.
	Pipeline leakage - Distribution System				
	Valve malfunction - PSP Cut-off valve				
	Outlet Tap malfunction/ missing		Verification, reporting, repair/ replacement	Supervision, provision of spare part/ replacement tap	

Annexure 16: Guidelines for Calibration of Piped Water Supply Schemes with Multiple Storage Reservoirs

Background & Purpose

In the AP III Project in Vizianagaram, multiple Medium Level Service Reservoirs (MLSRs) have been built in a number of PWS Schemes, as an alternative to single large Overhead Storage Reservoirs (OHSRs). In some of the smaller habitations, single MLSRs have sufficed, but in larger habitations, up to six and seven MLSRs have been built.

OHSRs have certain inherent problems – they are prone to vandalism on the distribution side, nullifying their very purpose – to provide storage. The purpose behind building MLSRs was to reduce the possibilities of vandalism and improve service delivery of water to users by providing decentralised storage facilities to "localities" or neighbourhoods within habitations, providing users a greater degree of control over "their" water from "their" MLSR. However, this hypothesis can only be tested by ensuring that all the MLSRs are filled on a regular schedule.

In a scheme with a single MLSR, virtually all the water from the pump will flow into the MLSR. In this case only the opening or closing of the inlet valve to the MLSR will determine the rate of flow into the MLSR.

In the case of a scheme with multiple MLSRs, filling of MLSRs may or may not be simultaneous. If the filling pattern is one-tank-at-a-time, then the filling is again governed by the opening of inlet valve only for that particular MLSR. Therefore, it is necessary to know the time required to fill an MLSR in a given scheme.

The time required to fill more than one MLSR in a scheme is governed by the rate of flow of water into the system of MLSRs, which in turn is governed by:

- the rate of discharge of water from the pump,
- the degree to which any Inlet Valve to any MLSR is opened,
- the extent to which water from the pump is simultaneously filling other MLSRs in the scheme, also determined by the opening of other Inlet Valves.

In a single-MLSR scheme, water from the pump, except for any Pumping Main leakage, will flow into the MLSR and determining the time required for filling the tank is a simple procedure. If the tank is allowed to empty and then refill with different settings of the inlet valve each time, the valve calibration exercise is fairly simple and is accomplished by plotting filling times against valve settings.

If more than one tank is filling at the same time, then inlet valve settings can control filling rates only partly. In such a situation, the simultaneous filling rates can only be determined by a two-step procedure. First each inlet valve has to be calibrated while the filling is kept to one tank at a time. Then, through a process of trial and error, using the single filling data as a guideline, simultaneous filling of multiple tanks has to be attempted by varying valve settings within limited ranges.

The problem of filling a number of tanks simultaneously is further complicated by the fact that MLSRs need not be of uniform size and pumping main pipe lengths to different tanks (and corresponding head losses and leakage losses) can be different.

Ideally.....
if Q_p = Discharge Rate from the Pump
and Q_1 = Desired Discharge Rate into MLSR No. 1
and Q_2 = Desired Discharge Rate into MLSR No. 2
and .....
and Q_n = Desired Discharge Rate into MLSR No. n
and Q_{sl} = Discharge Rate attributed to System Losses

and if the Scheme has "n" number of MLSRs
then $Q_p = Q_1 + Q_2 + ...+Q_n + Q_{sl}$

Further, if T = Filling time, assumed equal for all MLSRs (1, 2, ...,n) to fill at the same time, for a given value of Discharge Rate from the Pump (Q_p)

and V_1 = Volume of MLSR No. 1
and V_2 = Volume of MLSR No. 2
and .....
and V_n = Volume of MLSR No. n
and V_{sl} = Volume attributed to System Losses

then $T = V_1/Q_1 = V_2/Q_2 = ...= V_n/Q_n = V_{sl}/Q_{sl}$

Hence, in order to determine T, which is the time required to ensure that all MLSRs in the system will fill (almost) simultaneously, it is necessary to determine the volume of each MLSR and to calibrate the inlet valve to each MLSR. This will allow each valve to be set to the desired flow rate for each MLSR to simultaneously fill in the time T.

Assumption

The assumption in this exercise is that all MLSRs are empty, each time, when the pump is switched on for filling. Hence each MLSR will require to be filled to full capacity. In actual practice this may not be the case always, since MLSRs may not have been fully drained between two consecutive fillings.

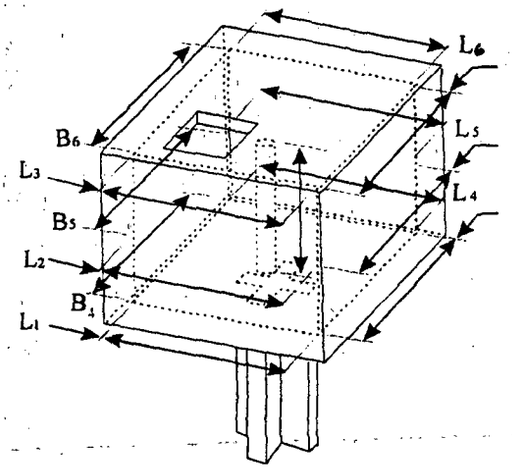
Methodology

The methodology proposed below is aimed at determining the two parameters that will determine T : Volume of an MLSR and Calibration of its Inlet Valve.

Measurement of Volume of an MLSR

A 10 m length Tape Measure and a Plumb Line are necessary for the measurements. Ladders are provided to reach the top of each MLSR and to climb into each MLSR. Two torches will be required to take measurements inside each MLSR.

This is a fairly simple procedure. It involves climbing into each MLSR and making three measurements of the cross section (six measurements of length and breadth, L_1 to L_6 & B_1 to B_6) of the MLSR. These can be at the floor level of the tank, the ceiling level and mid-way between floor and ceiling. The height of the Inlet Pipe above the floor level of the tank, H, will be the other measurement necessary to determine the tank's volume. It is assumed that the floor level of the tank is reasonable horizontal



The measurements should be written on the attached format - MLSR Data Sheet. After averaging the Length and Breadth, L_{av} and B_{av}, the volume can be determined. For convenience the volume should be recorded in litres.

Complete the remaining observation in MLSR Data Sheet. Indicate the Reduced Level at the base of MLSR, on the column plinth or set a Bench mark on the Column. Use the bench mark data from the original survey map on the basis of which the scheme was designed. Indicate the heights of the Column, top of Inlet Pipe, and Floor of Tank, from the Bench Mark at the base of MLSR.

Using values of average length and breadth of the tank to arrive at average cross-section, the Volume / Depth relationship can be plotted on a graph. This graph is used in computing the di charge rates in the next step, i.e., valve calibration, where filling rates need to be computed by measuring depths in water in the MLSR over given time durations.

Calibration of Inlet Valves

The tools and instruments required for this exercise is:

- A stop-watch to make time measurements in seconds.
- Water level measurements in the MLSR are necessary as the tank is filling. This can be done using a float-type water level gauge, a borewell water level recorder or a graduated wooden Dip Stick. In all these methods a drop pipe is essential to eliminate errors due to ripples on the water surface in the MLSR as it is filling.
- A small tin (50 ml) of white paint, a thin paint brush, some paint thinner and wiping cloth.

Three persons are required to make the necessary observations. One person should remain at the base of the MLSR to change valve settings upon instructions from the Time keeper. The Time keeper should be at the top of the MLSR write down the necessary observations of Start and End Times as the third person of the team, also on top of the MLSR, reads out the water level at fixed time intervals (in case a borewell water level recorder is used) or calls out gauge levels (if a float-type gauge or dipstick is used).

The procedure for inlet valve calibration is as follows:

The Inlet Valve wheel should be marked at one point of its circumference with paint that is kept in alignment with a similar paint mark made on the pipe on which the valve is mounted. These marks will provide a point of reference for counting the number of turns the valve wheel is turned in later operations.

The valve is then fully closed (by turning the valve wheel fully in the clock-wise direction) and then opened fully (anti-clockwise), counting the total number of turns required from the fully closed to the fully open position.

The total number of turns of the valve wheel from full close to full open should be divided equally to provide at least four to five (preferably more) settings of the valve in gradually increasing increments. The least-open position of the valve, i.e., the first step of the valve-open position will be termed as Setting No. 1. Similarly, Setting Nos. will progressively increase as the valve is opened further and further by increments of predetermined turns of the valve wheel. For example:

If the total no. of turns for a Valve from full-open to full- close positions		=	n turns
Then:	Setting No. 1 of the Valve	=	n/5 turns
	Setting No. 2 of the Valve	=	2n/5 turns
	Setting No. 3 of the Valve	=	3n/5 turns
	Setting No. 4 of the Valve	=	4n/5 turns
	Setting No. 5 of the Valve	=	n turns (full-open)

The Inlet Valve should once again be fully closed, and then opened to Setting No. 1. The pump should be run briefly to allow the tank to fill to a small depth (5 cm to 10

cm). This will eliminate any errors in further measurements due to irregularities in the surface of the tank floor, construction of haunches, etc. and allow the MLSR to begin filling at a steady rate.

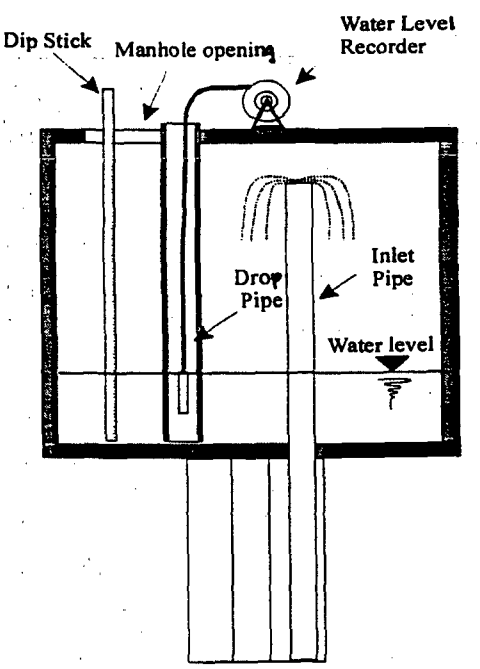
On the instruction of the Time Keeper, the water level in the MLSR should be called out and recorded. After a given time interval, say 120 seconds, the water level should be called out again.

If depth measurements are being made with float gauge then it is more convenient to note times against a fixed change in the level of the gauge. For example, time observations can be made every time the gauge rises by another 5 cm.

All depth measurements should be made from inside a PVC drop pipe with perforations at the bottom, to eliminate errors caused by ripples on the water surface in the tank.

Two more observations of times and water levels should be made, giving a set of three observations for Valve Setting No. 1. All these observations should be noted in the format provided for this purpose - Inlet Valve Calibration Data Sheet.

The Inlet Valve should be opened for the next step, i.e. to Setting No. 2 (while the pump is on). Again a small time interval, about 5 minutes, should be allowed for the flow rate to steady. Again three sets of time and depth change measurements should be made.



In a similar manner, the Inlet Valve should be opened to its successively higher open position, the flow allowed to steady, and three measurements of time and depth observations should be made for each successive valve setting, till the valve reaches its fully open position.

As mentioned earlier, the three observations for each valve setting should be accurately recorded in the attached format Inlet Valve Calibration Data Sheet. Time intervals and Depth changes should be computed for each observation and averaged for each Valve Setting. Volume and Discharge Rate values for each valve setting should then be computed, using the Volume/ Depth relationship from the MLSR Data Sheet completed earlier.

Plot the Discharge values against Valve Settings. These values, joined with a smooth curve, represents the Calibration Curve for that valve.

Computations

As stated earlier if the Scheme has "n" number of MLSRs;

And if Q_p, Q_1, Q_2, ..., Q_n and Q_{sl} are the Discharge Rate from the Pump and Discharge Rates into MLSR No. 1, into MLSR No. 2 ..., into MLSR No. n, and System Losses, respectively,

And if V_1, V_2,..... V_n and V_{sl} are the Volumes of MLSR No. 1, MLSR No. 2, ..., MLSR No. n and Volume attributed to System Losses, respectively,

And further, if T is Filling time, assumed equal for all MLSRs (1, 2, ...,n), since it is desirable that all MLSRs fill simultaneously,

then $Q_p = Q_1 + Q_2 + \ldots\ldots\ldots + Q_n + Q_{sl}$

then $T = V_1/Q_1 = V_2/Q_2 = \ldots\ldots = V_n/Q_n = V_{sl}/Q_{sl}$

Q_p is known (from the designed water need computation and from an actual discharge rate measurement at the well head, at the time of commissioning the scheme, or at any later point of time);

V_1, V_2, ... V_n are known from the MLSR Data Sheet;

Q_{sl} is assumed to be 15% of Q_p (as per the design assumption)

T is assumed to be 240 minutes, i.e., that all tanks will simultaneously fill with 4 hours of pumping (the design assumes that power will be available for 10 hours per day and that water will be supplied in two shifts, morning and evening).

From the above values, it is possible to compute Q_1, Q_2, ..., Q_n. From the Valve Calibration Graphs (refer format) for each MLSR, it is possible to set each valve to meet the theoretical discharges calculations.

Once the entire system is run with these valve settings, it will be possible to verify whether actually all MLSRs fill simultaneously and the extent of variation in filling times. Once the variations in filling time are observed (refer format System Calibration), then valve settings can be altered to allow overflowing tanks to fill slower or partially filled tanks to fill faster.

The way in which valve settings will be altered, will be governed by the actual system losses and whether the filling time needs to be changed from 240 minutes, i.e., if Q_p is more than, equal to, or less than $Q_1 + Q_2 + \ldots + Q_n + Q_{sl}$.

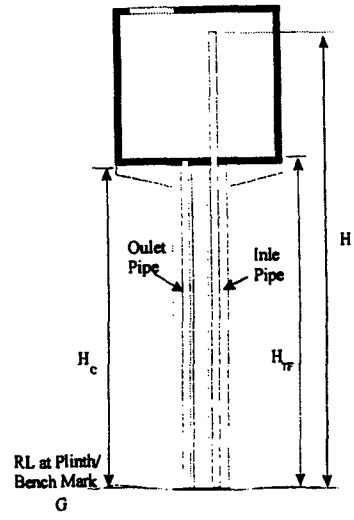
A shorter filling time will demand a greater discharge from the pump and a longer filling time may be required if the yield of the well drops in future.

The computations of Discharge Rate calculations and corresponding Valve settings should be tabulated in the format of System Calibration.

It may be necessary to make multiple sets of observations in order to arrive at the correct combination of valve setting for the entire system, in a multi-MLSR system. Multiple observations may be made on different days. The need to repeat observations may be decided by the total difference in time between the overflow of the first tank to fill and the last tank to fill. For example, if the last tank to fill overflows 10 minutes after the first tank had begun to overflow, then perhaps, this wastage should be considered acceptable. On the other hand if this difference is 30 minutes, then the system needs to be reset. The filling method can be fine-tuned progressively with each filling. However, it will be necessary to ensure that all tanks are empty before refilling. Also, it is essential to note any changes in valve settings and the consequences of these changes. As stated earlier, these observation should be recorded in the System Calibration format sheet.

MLSR Data Sheet

Scheme: .....
MLSR No./ ID/Location: .....
Date of Observation:.....
Design Capacity:.....litres

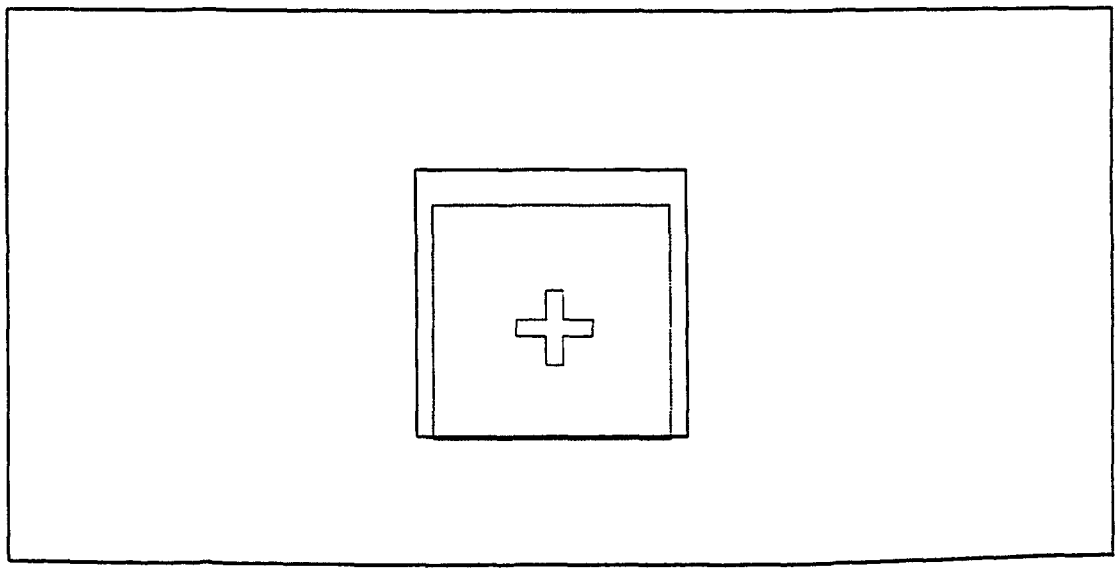


Reduced Level of Tank Plinth/
Bench Mark at Tank Column =
H_c - Height of Column from Plinth/
Bench mark (in m) =
H_I - Height of Inlet Pipe from Plinth/
Bench Mark (in m) =
H_{TB} - Height of Tank Floor from Plinth/
Bench Mark (,, in m) =

Internal dimension of the MLSR

	Observation No.						Averages L_{av}, B_{av}, H
	1	2	3	4	5	6	
Length –m (L_1 to L_6)							
Breadth –m (B_1 to B_6)							
Height -m (H)							
Volume –lit							

Provide a site sketch of the MLSR, showing the orientation of the column, details of pipes, valves and fitting (with length and materials) leading to and from the MLSR column. Please provide references to permanent features such as streets, houses, and north direction in the sketch.



Inlet Valve Calibration Data Sheet with Water Level Recorded or Dip Stick:
(where Start Time can always be set at "O" and time interval can be fixed, say 60 sec. or 120 sec.)

Scheme:
MLSR No./ ID/Location:
Date of Observation:

Valve Setting No.	Start time	Start Depth (cm)	End time (sec) 60/120	End Depth (cm)	Total time (sec) 60/120	Change in depth-cm	Volume (lit)	Discharge (lpm)
1 Obsv. 1.1	0							
1.2	0							
1.3	0							
Average "" for Setting No. 1								
2 Obsv. 2.1	0							
2.2	0							
2.3	0							
Average "" for Setting No. 2								
3 Obsv. 3.1	0							
3.2	0							
3.3	0							
Average "" for Setting No. 3								
4 Obsv. 4.1	0							
4.2	0							
4.3	0							
Average "" for Setting No. 4								
5 Obsv. 5.1	0							
5.2	0							
5.3	0							
Average "" for Setting No. 5								

Names and Signatures:
Time keeper
Water Level recorder
Valve Operator

Inlet Valve Calibration Data Sheet with a Float Gauge
(where Time and Depth observations can be continuous and time can be recorded against fixed changes of the Gauge level.)

Scheme:
MLSR No./ ID/Location:
Date of Observation:

Valve setting*	Obsv. No.	Start of Observation		End of Observation		Time span of Observation (sec)	Change in depth (cm)	Volume (lit)	Discharge (lpm)
		Time (min/sec)	Depth (cm)	Time (min/sec)	Depth (cm)				
1	1								
1	2								
1	3								
Average 1									
2	1								
2	2								
2	3								
Average 2									
3	1								
3	2								
3	3								
Average 3									
4	1								
4	2								
4	3								
Average 4									
5	1								
5	2								
5	3								
Average 5									

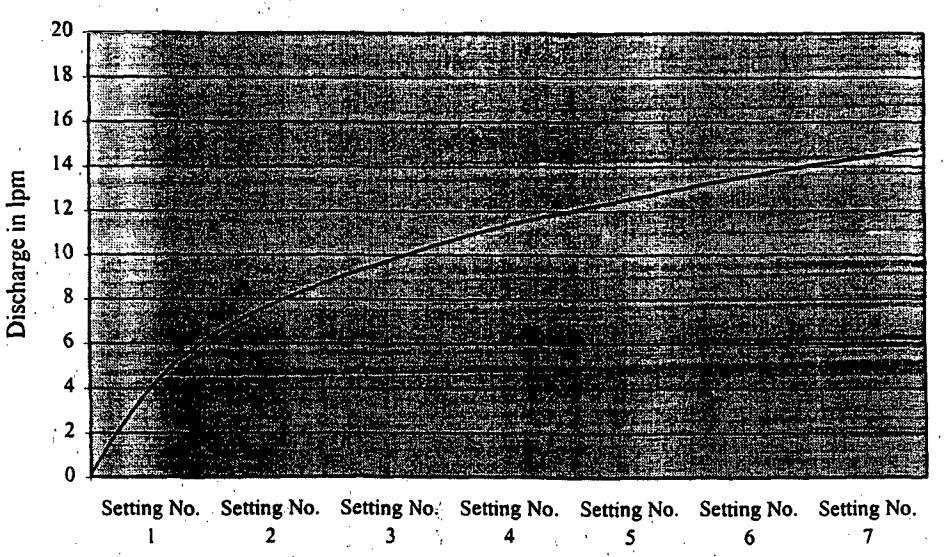
Names and Signatures:
Time keeper
Water Level recorder
Valve Operator

Inlet Valve Calibration Graph

Scheme:
MLSR No./ ID/Location:
Date of Observation:

	No. of Turns	Discharge (lpm)
Setting No. 1		
Setting No. 2		
Setting No. 3		
Setting No. 4		
Setting No. 5		
Setting No. 6		
Setting No. 7		

Valve Calibration Graph



System Calibration

Scheme:

Date of Observation:
Pump Discharge Q_p =..... lpm
Filling Time T =..... minutes

MLSR No.	Volumes – lit	Computed Discharge – lpm	Valve Setting No. of Turns	Observation - Overflowing time with ref. to T (±) min.
1	(V_1)	(Q_1)		
2	(V_2)	(Q_2)		
n	(V_n)	(Q_n)		

Date of Observation:
Pump Discharge Q_p =..... lpm
Filling Time T =..... minutes

MLSR No.	Volumes – lit	Computed Discharge – lpm	Valve Setting No. of Turns	Observation - Overflowing time with ref. to T(±) min.
1	(V_1)	(Q_1)		
2	(V_2)	(Q_2)		
n	(V_n)	(Q_n)		