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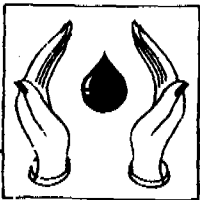
INDIA

ANDHRA PRADESH

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INTERNATIONAL REFERENCE CENTRE
FOR COMMUNITY WATER SUPPLY AND
SANITATION (IRC)

*OM evaluation
AP-I*



NETHERLANDS ASSISTED PROJECTS OFFICE

1-2-412/9 GAGAN MAHAL COLONY HYDERABAD-500 029 - A.P.

822-INAN90-11354

EXTERNAL EVALUATION OF O&M OF AP I SCHEMES
16 JUNE TO 22 AUGUST 1989

EXTERNAL EVALUATION

SUMMARY FINDINGS
AND RECOMMENDATIONS

O&M-API

CONSULTANTS:

MR.B.V.S.SOMAYAJULU, RETD. DY.EXECUTIVE ENGINEER, PHED
MR.Y.RAJA RAO, STATE COORDINATOR, CATHOLIC HEALTH ASSN. OF A.P.

HYDERABAD
APRIL 1990

LIBRARY, P. O. BOX 11354 CENTRE FOR THE STUDY OF WATER SUPPLY AND SANITATION P. O. BOX 11354, HYDRABAD, INDIA Tel: (070) 6611111
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1. INTRODUCTION:

- a) As decided during Review and Support Mission 21, an external team consisting of a water and sanitation engineer and a community development specialist evaluated a representative sample of 10 PWS and 2 CPWS schemes out of a total of 50 PWS schemes and 4 CPWS schemes commissioned under NAP AP 1.
- b) The team consisted of:
- Mr.Somayajulu, retd. Deputy Executive Engineer, PHED
 - Mr.Y.Raja Rao, State Coordinator, Catholic Health Association of A.P.
- c) NAP Office supported the study and briefed the team extensively.
- d) The team started its work from 16 June 1989 and submitted its report to NAP Office on 22 July 1989. Of these 18 days were spent in the field studying the schemes.

2. SAMPLES SELECTED FOR THE STUDY:

- a) The universe of the study was the 201 villages of AP I and 30 Additional Villages schemes. These schemes are spread over 6 districts and under the jurisdiction of 6 PR circles and 13 PR divisions.
- b) Operation & Maintenance Jurisdictions:

Circle	Division	Schemes	O/M Grants
Karimnagar	Karimnagar	2	0.470 lakhs
	Peddapally	1	
Kurnool	Adoni	1	0.250 "
	Kurnool	1	
Guntur	Markapur	3	1.570 "
	Ongole	2	
	Kandukur	7	
	Guntur	9	3.898 "
Ongole	Narsaraopet	12	
	Darsi	3 CPWS, 1 PWS	41.200 "
Hyderabad	Mirayalaguda	3	1.320 "
	Nalgonda	8	
Eluru	Vijayawada	1 CPWS	1.300 "
6	13	54	50.008 lakhs

c) The nature of the schemes:

These 201 schemes consist of 4 CPWS and 50 PWS schemes

District	Scheme	Villages	OE	RE
Prakasam	CPWS Darsi	111	569.00	736.60
	CPWS Chndvrm	25 (+4)	278.90	375.00
	CPWS Kurichedu	6 (+4)		
	PWS M.G.Varam	1		
	PWS	12	46.00	60.10
Guntur	PWS	21	150.90	231.90
Krishna	CPWS Adivi-ravulapadu	6 (+2)	33.00	43.00
Nalgonda	PWS(11)	14	42.50	44.59
Karimnagar	PWS	3	22.20	29.62
Kurnool	PWS	2	6.50	6.70
	CPWS = 4	148(+10)		
	PWS = 50	53		
6	54	201(+10)	1149.00	1527.51

d) Of these 4 CPWS and 50 PWS schemes, a representative sample of 2 CPWS and 10 PWS were selected for the study. A structured random sampling method was used for the selection, ensuring that all the 6 districts were covered. The list of schemes visited is provided below:

Village	PR Division	District	Scheme
Yendapally	Peddapally	Karimnagar	PWS
Edurur	Kurnool	Kurnool	PWS
Darimadugu	Markapur	Prakasam	PWS
Peddarajupalem	Kandukur	Prakasam	PWS
Raparla	Ongole	Prakasam	PWS
Peddakurapadu	Guntur	Guntur	PWS
Vitramrajupally	Narsaraopet	Guntur	PWS
Adigoppula	Narasaraopet	Guntur	PWS
Tellabally	Miryalaguda	Nalgonda	PWS
Kanchanapally	Nalgonda	Nalgonda	PWS
Adiviravulapadu	Vijayawada	Krishna	CPWS
Chandavaram	Darsi	Prakasam	CPWS

- e) The detailed time schedule of the evaluation is appended to this report.

(annexure 1)

3. METHODOLOGY:

- a) The Minimum Evaluation Procedure (MEP) was adopted for the study. Suitable elaborations were made on these guidelines in consultation with NAP Office and keeping in mind the guidelines provided by Review and Support Missions.

(annexure 2)

- b) The steps followed in the evaluation were as follows:

- 1) Is the scheme FUNCTIONING?

If NO, is it due to - DESIGN SHORTCOMINGS
- EXECUTION DEFICIENCY
- INADEQUATE O&M

- 2) Is the scheme functioning EFFICIENTLY?

If NO, is it due to:

- Inadequate PREVENTIVE maintenance
- Delay in CORRECTIVE maintenance
- Failure in BOTH preventive and corrective maintenance
- Poor OPERATION
- Insufficient O/M FUNDS
- Insufficient TRAINING OF O/M STAFF
- Inadequate SUPERVISION?

- 3) If the scheme is functioning satisfactorily, assess the level of efficiency and suggest ways and means to improve efficiency.

- 4) Is the scheme functioning EFFECTIVELY?

If NO, is it due to:

- Inadequate COMMUNITY PARTICIPATION
- Lack of resource/knowhow of PANCHAYAT
- because the scheme does not correspond to the NEEDS and EXPECTATIONS of the people or because people are not AWARE of the purpose, technology etc., of the scheme?

- 5) General assessment of the functioning.

efficiency and effectiveness of the commissioned AP I schemes

- 6) Recommendations for streamlining the O/M of AP I schemes.

4. FINDINGS:

- a) The over all conclusion of the team is that consumers are not receiving protected water of the required quality, in any scheme evaluated. Thus though in general the schemes are functioning, the efficiency and effectiveness are below what could be expected of schemes that receive so much attention and frequent monitoring.
- b) Preventive maintenance is not being generally attempted. Corrective maintenance is not systematised. Maintenance of pump houses, valve chambers, filter areas, and service reservoirs leaves much to be desired. Sanitation around headworks and distribution points was poor. Residual chlorine was every where absent. No records and log books are maintained at pump houses, filter units etc. Flow diagrams detailing the distribution system were also not displayed.
- c) Operation and maintenance are poor because of lack of training of personnel and because of inadequate supervision.
- d) The supervisory staff know that the functioning of schemes is below average. What is lacking is not awareness but of O&M procedures and their enforcement. O&M institutional arrangements are inadequate.
- e) There is inordinate delay in carrying out corrective maintenance.
- f) When there is no attention paid to corrective maintenance, there is no point in talking about preventive maintenance.
- g) The team has quantified its assessment of the functioning of schemes on a rating scale, annexed to this report.

(annexure 3)

The rating indicates that the efficiency of AP I is just about average.

5. RECOMMENDATIONS FOR IMPROVED PERFORMANCE:

a) General:

- Mesh arrangements for covering open wells
- protect open wells to prevent drawal of water by pulleys (implication: ensure regular supply through the system)
- protect headworks/operating areas with fencing
- promote social forestry around SST, seepage areas, OHSRs, Pump houses, GLSRs, Standposts.

b) Residual Chlorine:

Residual chlorine should be maintained as 0.2 ppm at the tail-end point of each scheme. For this:

- every operator must have a chlorine test kit and he should know how to use it
- he should maintain a record of the dosage of chlorine each day
- this register should be verified by the section officer once a month and residual chlorine personally checked and entered in the register.

c) Attention to Sanitation around PSPs:

- platforms should be properly repaired and drain-off arrangements made. Turncocks should be held personally responsible for this
- HDPE Pipes that have sprung leaks should be replaced immediately.

d) Valve Chambers:

covers should be provided to all chambers and painting of valves taken up regularly. Side walls should be white washed. Turncock should be held personally responsible to keep valve chambers neat.

6. RECOMMENDATIONS FOR PREVENTIVE MAINTENANCE:

a) Log book should be maintained in each pump house

b) the items to be entered in this book should be finalised and operators/supervisory staff instructed on how to

maintain the register.

- c) the supervisory staff should check the log book whenever they visit the scheme and also initial the log book
- d) An inventory of tools, spares and stocks should be maintained at the pump house and the supervisory staff should also check and initial the register.
- e) The flow diagram of the scheme with all details should be provided in the pump house.

7. TRAINING OF PERSONNEL:

a) Operators:

Training programmes for pump and filter bed operators is urgently required. Training could include record keeping, thumb rule for regular check on the system, etc.

b) Supervisory Staff:

A workshop on preventive maintenance procedures.

8. INSPECTION OF SCHEMES:

- a) Section Officer should visit the scheme once a fortnight and inspect all records and initial them. Once a month he should send a written report to the Dy.EE on the functioning of the scheme, stock/spares/tools position, matters to be taken up urgently, etc., on a prescribed proforma.
- b) Senior supervisory staff (Dy.EE) should send a written report to the Executive Engineer on the status of the scheme, on preventive maintenance aspects etc. after personally visiting the scheme at least once a month.
- c) Executive Engineer should visit the scheme at least once in a quarter and forward his report to the SE on a prescribed proforma.

9. WATER QUALITY MONITORING:

At least once in 3 months a water quality report (bacteriological and chemical regarding fluoride affected villages) should be prepared. This should be the responsibility of the Dy.EE.

10. A WORD OF THANKS:

The team received maximum cooperation from the concerned EEs, Dy. EEs, JEs and other personhel of the department.

The team wishes to place on record its appreciation for the openness with which departmental officers discussed O&M problems. Every aspect of the scheme was open for scrutiny.

The observations of this team should not be viewed as an attempt at fault finding. In fact, the team is of the opinion that operation and maintenance of water supply schemes require much greater thinking and policy formulations at the State level. Adhoc and piecemeal approaches are not adequate. To the extent it contributes to the appreciation of the need for such policy/procedures formulation, this evaluation would have been more than worth the while.

ANNEXURE - I

FIELD VISITS SCHEDULES

PERSONAL ATTENTION:-

GOVERNMENT OF ANDHRA PRADESH
PANCHAYATI RAJ DEPARTMENT

OFFICE OF THE CHIEF ENGINEER, R.W.S., HYDERABAD.

MEMO NO. NAP/AE1/VISITS/89,

DATE: 20.6.1989.

Sub: NAP - External Evaluation of AP-I
Schemes - Visit of Team from the
NAP OFFICE HYDERABAD - Certain
arrangement - requested - regarding.

A team of two persons constituted by the NAP Office were proposed to tour from 25th June '89 for evaluation of A.P.I. Schemes. A total number of 12 villages were selected to evaluate among the A.P.-I. Schemes.

A copy of the tour programme and selected villages is herewith enclosed.

Hence all the Executive Engineer concerned are requested to make arrangements to accompany the field visits by the Deputy Executive Engineers of the concerned Schemes.

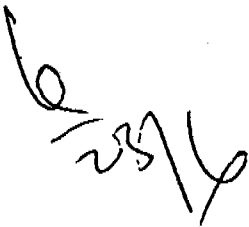
This is teated as Most Urgent.

Encl: As above.


for Chief Engineer, (RWS)
Hyderabad.

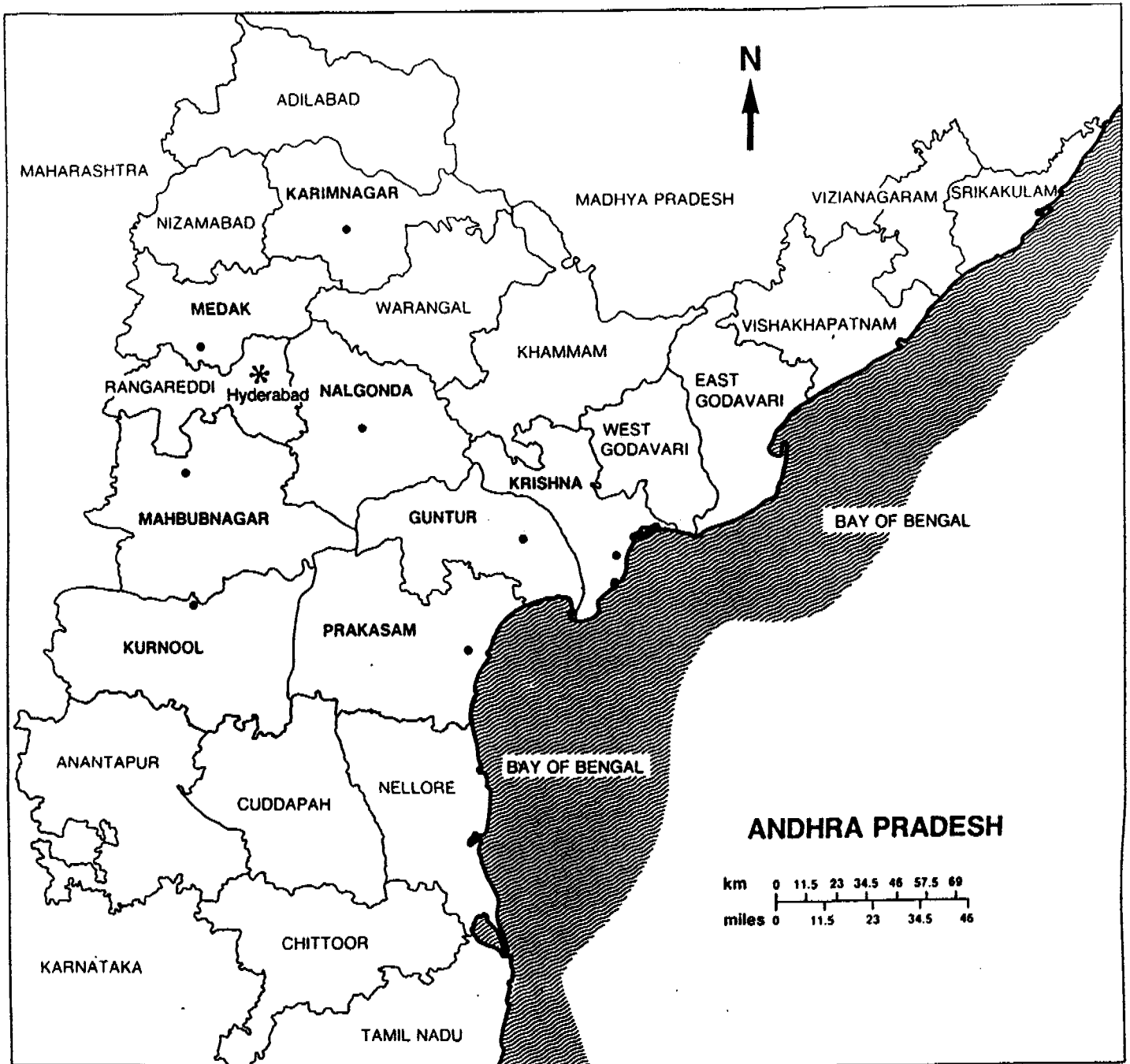
To
The Executive Engineer,
Panchayati Raj,
Peddapally/Kurnool/Markapur/Kandukur/
Ongole/Guntur/Narasaraopeta/Miryalaguda/
Nalgonda/Vijayawada/Maintenance Division (NAP) Darsi.

Copy to the:
Superintending Engineer, PR,
Ongole, Santhapeta, Ongole,
Executive Director, Technologi Mission,
Plot.No.2, Doctors' Colony, Kurnool.
Superintending Engineer,
Panchayati Raj,
Karimnagar/Guntur/Hyderabad/Eluru.



EXTERNAL EVALUATION OF O&M OF AP I SCHEMES
 FIELD VISIT SCHEDULE FOR ASSESSMENT OF SELECTED SCHEMES
 JUNE 25 TO JULY 13, 1989

Sl. No.	STARTING DATE	FROM	TO	NAME OF PR DIVISION	SCHEME TO BE ASSESSED	DURATION OF STAY	REMARKS
1	2	3	4	5	6	7	8
1	June 25	Hyderabad	Peddapalli	Peddapalli	Yendepalli	1 day	Return to Hyd.
2	June 27	Hyderabad	Kurnool	Kurnool	Yedurur	2 days	Camp
3	June 29	Kurnool	Markapur	Markapur	Darimadugu	1 day	Camp
4	June 30	Markapur	Kandukur	Kandukur	Peddarajupalem	1 day	To Ongole
5	July 1	Ongole	Raparla	Ongole	Raparla	1 day	To Guntur
6	July 3	Guntur	Sathenapalli	Guntur	Peddakurapadu	1 day	To Vinukonda
7	July 4	Vinukonda	Vinukonda	Narasaraopet	Vitramrajupalli	1 day	Camp
8	July 5	Vinukonda	Vinukonda	Narasaraopet	Addigopula	1 day	To Macherla
9	July 6	Macherla	Miryalaguda	Miryalaguda	Tellebally	1 day	Camp
10	July 7	Miryalaguda	Nalgonda	Nalgonda	Kanchenapalli	1 day	Return to Hyd.
11	July 9	Hyderabad	Nandigama	Vijayawada	Adaiviravulapadu	2 days	Camp
12	July 11	Nandigama	Darsi	Darsi	Chandavaram	3 days	Camp

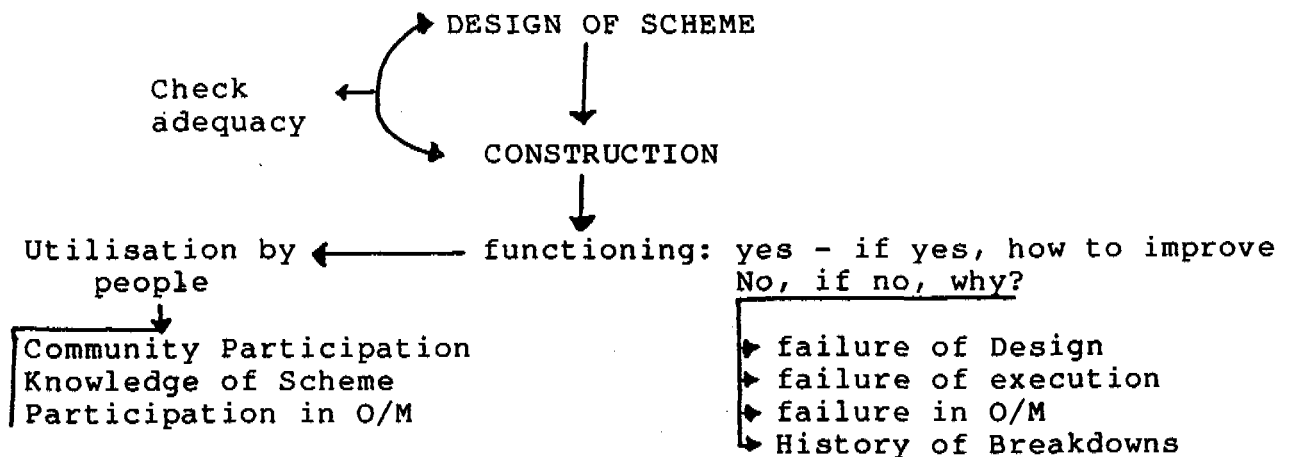


ANNEXURE - II

TERMS OF REFERENCE AND EVALUATION STRATEGY

STRATEGY OF EVALUATION

1. The evaluation is a general study - to get an overall idea of:
 - functioning of scheme
 - level of people's involvement
2. The study should help build up a proper "information base" at least on 12 schemes + 1 pre-test.
3. Strategy:



O/M: Preventive O/M - procedures.....

Corrective O/M - procedures.....

Bottlenecks: | personnel
| communication
| skills
| finance
| lack of inventory/systems
| tools/spares, etc.

4. Findings: Where do schemes fail most often?
What can be done to improve performance?
What type of procedures/records for O/M are required.
5. Overview/general impressions:
 - maintenance of raw water source
 - maintenance of pump houses
 - maintenance of filters/surroundings
 - maintenance of OHSRs/GLSRs
 - maintenance of lines (air valves, scour valves)
 - maintenance of distribution design
 - maintenance of standposts
 - peak factor response
 - sanitation around facilities
 - follow up by Dy.EE/EE
 - cooperation of panchayat

ASSESSMENT OF THE SCHEMES

Rating of Evaluation on a 100 points scale

Sl No	Name of the Scheme	Source	Regularity of Supply	SST Filters	Residual Chlorine	Trs Leaks	Hygeinc Condtns/SR	Pumps/PH Pr. in taps	Total			
Max Points allotted --->			20	5	15	25	12	5	5	10	3	
1	Yendapally	Good	18			10	4	2	2	7	2	45/80 (56%)
2	Edururu	Satisfactory	10			0	2	5	2	3	1	23/80 (29%)
3	Darimadugu	Good	12			12	5	5	3	6	1	44/80 (55%)
4	Peddarajupalem	Satisfactory	10			10	0	2	2	5	2	31/80 (39%)
5	Raparla	Not Satisfactory	10			0	1	2	2	5	2	22/80 (28%)
6	Peddakurpadu	Failed	0									
7	Vittanrajupalem	Not Satisfactory	10			12	6	1	2	6	2	39/80 (49%)
8	Addigoppula	Fald/Alternt	16	0	5	10	5	1	1	4	2	44/100 (44%)
9	Tellabally	Satisfactory	16			10	1	3	3	4	2	39/80 (49%)
10	Kanchanpally	Good	18			0	6	2	3	6	2	37/80 (46%)
11	Adaviravulapadu	Good	18	3	10	20	6	2	2	5	2	68/100 (68%)
12	Chandavaram	Good	18	5	0	10	4	3	3	6	2	51/100 (51%)
Percentage of Points Scored			71%	53%	33%	34%	30%	51%	45%	52%	61%	443/1040 (43%)

Evaluation of Existing Water Supplies

te: Paragraph 1 resulted from discussions between Review Mission and NAP-office. Paragraphs 2 and 3 are suggestions offered by the Review Mission.

Objectives

The objectives of the proposed evaluation are five-fold:

1. to have an overview of the performance of AP-I water supply systems.
2. to enable the formulation of future water supply projects (AP-3)
3. to assist the PRED on matters of design, implementation and operation and maintenance of water supply systems
4. to enable the formulation of training requirements of field personnel engaged in operation of water supply systems
5. to enable the preparation of plans for the rehabilitation of schemes that have failed, totally or partially.

Scope of Study

The evaluation will comprise two comprehensive schemes (out of 4), and 10 individual schemes (out of 52), distributed over the six districts where NAP-schemes were constructed.

It is proposed to undertake a sample study first, comprising two individual schemes to gain experience and to adjust the evaluation formats.

The study is expected to take approx. 3 months and will require an input of approx. 6 man months, contributed mainly by a socio-economist and a water supply engineer.

The study will only be implemented in close cooperation with PRED.

Methodology

The study will comprise the following areas:

1. Technical description of the system
2. Assessment of functioning of the system
3. Assessment of potential and actual beneficiaries
4. Financial Analysis
5. Institutional analysis.

The technical description would aim to inventorise hardware installed. The functional assessment would aim to provide data or system functioning in terms of quality, quantity and reliability of supply. The assessment of beneficiaries would describe the potential users of the system (within reasonable distance of supply points), and actual users. Where low use is prevalent reasons for such would be investigated. Financial analysis aims to provide data on investment cost, operational budgets require-

ments and actual expenditures. Institutional analysis would analyze the organizational structures, members, tasks and performance of personnel and assess training requirements. A provisional checklist for each area of study is shown below:

Technical Description

- Review of design parameters
- Review of system components as per design
- Description of system components as grounded including an assessment of state of repair
- Description of number, location and type of water points

Functional Assessment

- efficiency of water treatment
- quality of water at distribution points
- quantity of water supplied (actual)
- supply hours (actual)
- Reliability of supply, minor and major supply interruptions, incidental and structural supply failures

Assessment of Beneficiaries

- Number of population in supply area
- Number of population actually using water supply
- View of user and non-user population on functioning of the system.

Financial Analysis

- Investment cost of system, distinguishing major components
- Appreciated investment cost (current replacement value)
- Recurrent budget requirements, distinguishing major categories of expenditure
- Actual recurrent expenditure, distinguishing same categories

Institutional Analysis

- Authority responsible for operation and maintenance of system
- Organizational set up
- Numbers, tasks, and skills (training) of personnel
- Operational Procedures and Quality Control

ANNEXURE - III

RATING OF THE FUNCTIONING OF THE SCHEMES ASSESSED