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REPORT OF THE EVALUATION TEAM

AP Ramesh

set up by
The Ministry of Works & Housing
Government of India

ON

WHO/UNICEF ASSISTED RURAL WATER SUPPLY PROGRAMME

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INTRODUCTION

"The sanitation level in this country is one of the lowest even among the developing countries on the basis of incidence of water-borne diseases ... provision of drinking water and sanitation measures have to be approached in an integrated manner since lack of these minimum facilities have a direct bearing on the working condition of the people and their capacity for fruitful production." It is estimated that 1760 million man-hours are lost every year due to the number of people who are incapacitated by water-borne diseases. It is also further estimated that the nation is losing about Rs 4,500 million per year on account of treatment, medicines and loss of production.

The programme of supply and drinking water to the rural areas has to be viewed in this background. The concern over provision of potable drinking water is not new. The Bhoré Committee (1947), the Environmental Hygiene Committee (1948-49), the National Water Supply and Sanitation Committee (1960-61) have all urged for a comprehensive water supply programme. In the first Plan, only Rs60 million were allocated for water supply. In the fourth Plan, it went upto Rs1,240 million and in the fifth Plan, the amount is Rs5,730 million. However, the percentage of allocations on water programmes, both urban and rural, rose from 1.4 in the first Plan to 2.6 in the fourth Plan of the total outlay. In the fifth Plan, it is 1.5%. The amount allocated to the rural water supply till the fourth Plan has been far less than for the urban areas. In the first Plan, only

12% of the total allocation was designated for rural areas whereas in the fourth Plan, it was 30%. In the fifth Plan, the amount for rural water supply is more (rural 5,730 million, urban 4,230 million). It is estimated that more than 80% of the urban areas have been covered.

The allocation of funds is only one aspect of the programme. There is a need to study all the various operational aspects in order to understand the programme. The Estimates Committee (1971-72) was highly concerned over the slow progress. The CPHEEO and the UNICEF have had no systematic information on all the aspects for evaluation. It is in this context that the Government of India appointed an evaluation team to look at the programme in a comprehensive manner. The team has attempted to do this in spite of the constraints of time and full time personnel.

Purpose of the evaluation

The Government of India, Ministry of Works & Housing under letter No. M.12014/3/74-PHE dated 9.9.74 set up a team consisting of the following

1. Representative from CPHEEO, Government of India
2. Chief Engineer (Panchayati Raj Dept.) A.P.
3. Public Health Engineer (Rural) M.P.
4. Director, Groundwater Surveys & Development Agency, Pune, Maharashtra
5. Representative of UNICEF
6. Representative of WHO
7. State Chief Engineer of the State taken up for evaluation

to evaluate the progress made under the WHO/UNICEF assisted rural water supply programme during the fourth five year plan.

After some deliberations by the team it was decided that the programme of rural water supply would be looked at as a whole and that the evaluation would not be confined merely to the performance of the rigs provided by UNICEF. This is partly due to the fact that in all the states except for one there was no separate organisation for the operation and the maintenance of the rigs supplied by UNICEF. The problems, therefore, were the same whether the rigs were supplied by the UNICEF or bought by the state. It was further agreed that the team would take an overview of the programme although the major concern would be with regard to the accomplishments. It is assumed that the study of accomplishment would throw up the factors which are responsible for accomplishments or for non-accomplishments. While the Government of India had suggested the evaluation upto the end of fourth five year plan the Committee decided that they would collect information for 1974-75 as well.

In the earlier stages, the accomplishments were to be considered in terms of long-term objectives, i.e. as to whether the health of rural areas had improved. It was found difficult to operationalise this concept. Giving the constraints of time and resources, the study would be confined to analysing the extent of provision of potable water to the rural areas. When looked into depth, it was found necessary to look at many facets of the programme even for an analysis of this aspect. The accomplishments in terms of provision of drinking water could be

measured by the number of villages covered, the number of wells drilled, the number of pumps installed and further the number of pumps actually functioning. To get a proper perspective, it was necessary to look at the organisation, allocation of resources, the equipment, its maintenance, the decision making process and the people's response, to mention only a few of the factors that needed to be considered. A guideline covering these various aspects was designed. The teams collected information using the guideline as a base (see Appendix 1).

It must be emphasised here that the present exercise was conceived as only the first phase of the evaluation study that has been planned in the 5th plan (vide MPO). As indicated in the previous para while a perspective was gained there is not sufficient depth in the present data to make a proper analysis of the situation. It could be said that this phase has indicated the areas which need to be studied carefully for expediting the progress of the programme.

The team members were broken up into sub-teams of three each with a leader. Each of the teams studied two or three states. One state was studied in greater detail by each team including visits to the field. The discussions in such states were held with Ministers in charge as well as the drillers at the operational level. In the other states the teams discussed the programme with the officials and executive in the Headquarters.

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The information was collected more specifically on the following aspects:

- Accomplishments
- Villages covered
- Wells bored
- Pumps installed
- Budget and its break-up
- Personnel
- Performance of the rigs
- Perspective plans
- The equipment
- People's participation.

The information in spite of a common questionnaire is not as uniform as was anticipated. However, it is sufficiently so to warrant a comparative analysis. The differential rate of performance is indicated and wherever possible explanations have been suggested.

The present report does not go into details (the details are available in separate reports for each of the eight states studied). The purpose of the present report is to look at the totality of the situation in the country and the factors which have a bearing on accomplishments. There is an effort also to look at the problems, the removal of which could expedite the implementation of the programme.

It might be useful to point-out that there have been other

studies to assess the programme of rural water supply. The WHO report of August 1974 is a fairly detailed one. The 38th report of the Estimates Committee (1972-73) also has analysed the implementation of the programme. There have also been spot studies with regard to the functioning of pumps in Tamil Nadu and Maharashtra.

The present report differs from them in many ways. The data collected in the present study covers larger geographical as well as programme areas. An effort has also been made to collect it systematically so that there could be a comparative approach. The data was provided by the states on the basis of the questionnaire sent to them. This information was discussed with the officials and the executives concerned for the team members. The study looks at the totality of factors - from the policy formulation to the people's participation in the programme. As mentioned earlier, the concentration in the report is on accomplishments with reference to the provision of water to rural areas. The study of impact on health would have to come later.

The team members were not engaged in this evaluation on a full time basis. They had to depend on the data that was supplied by the state. A questionnaire and a guideline was sent to them in advance. There is very wide variation in the data supplied by the states. In some cases the information was given only with regard to the rigs supplied by UNICEF, in others there is information on both the rigs bought by the state as well as

those supplied by UNICEF. The report does not make any distinctions as it was found that the problems with regard to the operation of the programme are the same regardless where the rigs came from.

In spite of uniform proforma that were sent out the information provided is not uniform. The team members did not have time to collect information in a systematic manner. Consequently a method had to be evolved to make some comparisons among the states. The rationale for comparative approach was that such an analysis would provide insights as to the factors that affect the progress of the programme. In the tables, the comparisons are based on the average of averages. (e.g. one state might give us the total number of rigs and the total number of wells that were bored. What is being done for comparative purposes is to divide total number of wells dug by the total number of rigs which gives the average number of wells bored per year). In the next phase of the study the data would need to be collected in a more systematic manner which should also include spot checks.

Accomplishments

The task as envisaged by the National Water Supply and Sanitation Committee was "that safe water supply should be provided within the reach of every village and hamlet by the end of the third Plan, if possible, and before the end of the fourth Plan in any case". The accomplishments are a far cry

from this. The Estimates Committee Report of 1972-73 said only 22,000 villages were covered in 18 years of work. At present, there seems to be some acceleration of the programme. The data gathered with regard to the number of villages in these seven states covered shows that only 36 per cent of the problem villages have been covered upto the end of 1974 (Table I).

TABLE I

Showing the number of problem villages, the number of villages covered and percentage of the villages covered.*

State	No. of problem villages	No. of problem villages covered	% col. 3 & col. 2
A.P.	29398	10356	35
Gujarat	3787	2271	60
Rajasthan	11630	2083	18
Karnataka	10984	3823	35
M.P.	16700	8031	48
Tamil Nadu	7146	3392	47
Maharashtra	9433	1758	19
Total	89078	31714	36

An intensive programme was started in all the states at the beginning of the fourth Plan, yet the coverage is very varied.

- * 1. The problem village is defined as one which has no source of its own or is unable to get water from a distance of less than one kilometer.
2. The information provided in the table refers to the number of villages as indicated up to the end of 1974. Surveys are being carried out to locate the problem villages. It is possible by the time this report is submitted the number of problem villages may go up.

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While in Rajasthan and Maharashtra, the number of villages covered is less than 20%, in Gujarat it is 60%. One possible explanation is that the number of problem villages in Gujarat is less than 25% of the number of villages in Rajasthan and 40% of the villages in Maharashtra. Looked at from the point of view of the actual number of villages covered, Andhra Pradesh leads with Madhya Pradesh coming as a close second. In Tamil Nadu 47% of the villages have been covered. Part of this high coverage has been due to the accelerated programme between 1973-75 due to the drought. The number of villages covered in 1974-75 was 2,139 as compared to 836 in 1973-74 and 225 in 1972-73. It must, however, be noted that the achievements were under an emergency situation. The number of rigs were 47, some of which were borrowed from other states. The number of rigs in each state might partly explain the difference in performance (Andhra Pradesh has 46, Madhya Pradesh 39, Rajasthan 39, and Gujarat 37. More details will be given under section on Equipment).

The overall number of villages covered is about one-third of the total problem villages in the states studied. It was envisaged that 36,000 villages, out of about 1.5 lakhs, would be covered by the end of fourth Plan (data of actual accomplishments for this period is not available). The approach till the fourth Plan has been rather halting. There is need for the programme to gather momentum. The achievements are far below the expectations of the National Water Supply Committee - of all the villages being covered by the end of the fourth Plan.

Number of wells drilled

The total number of wells drilled in all the states was 37,279. 7080 were unsuccessful (either no water or insufficient water). The overall percentage of unsuccessful wells is 19. In Tamil Nadu, the percentage of unsuccessful is only 9, whereas in Maharashtra it is 35. The rate of failure is also high in Gujarat. Looking at the situation over the years (i.e. 1969 to 1975), it was noted that while in some states, the percentage of unsuccessful wells bored had come down in others it had gone up; In Andhra Pradesh, it had come down from 24% to 14% whereas in Madhya Pradesh, it had gone up from 14% to 24%. In Gujarat also, it had gone up. There was no clear trends in Rajasthan, Karnataka and Tamil Nadu (for example, in Tamil Nadu in 1971-72, it was 10%, in 1972-73 it was 5%, and in 1973-74 it was 12%).

The geophysical condition is part of the explanation. An evaluation of the success of the bore wells for different geological formations is considered very essential. For instance Basaltic rock formations are considered more difficult when compared to formations such as limestone, sandstone or granite for striking water supply in borewells. (In this connection a report by A. Moller, UNICEF Expert - submitted in April 1973 may be perused). In Andhra Pradesh, it was indicated that the use of the geophysical instrument had brought down the percentage of failure. Not all the states have the necessary geophysical instrument. In some other states, they are not being used to the extent they should be (Rajasthan, Madhya Pradesh and Gujarat).

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The data was collected for the wells drilled depth-wise - 80' to 125', 126' to 200' or 201' and above (Table II).

TABLE II

Number of unsuccessful wells bored and the percentage of unsuccessful wells

	0 - 125		126 - 200		201 +	
	No. of wells S + F	No. of failure wells	No. of wells S + F	No. of failure wells	No. of wells S + F	No. of failure wells
Andhra Pradesh	8584	1587 (18.5%)	704	155 (22%)	78	23 (29.5%)
Gujarat	1501	662 (44.1%)	2559	679 (26.5%)	13	2 (15.5%)
Rajasthan	1514	300 (19.8%)	182	52 (26.6%)	117	28 (24.0%)
Karnataka	2959	428 (14.5%)	2081	308 (14.8%)	527	81 (15.4%)
Madhya Pradesh	1464	311 (21.2%)	2398	286 (11.9%)	611	225 (36.8%)
Maharashtra	443	117 (26.4%)	1074	374 (34.8%)	370	175 (47.3%)
Tamilnadu	1326	156 (11.8%)	1176	73 (6.2%)	51	3 (5.9%)
Total	17791	3561 (20%)	10174	1927 (18.9%)	1767	537 (30.4%)

In some states, the percentage of failures was lower in the 80 to 125' depth range (Madhya Pradesh, Andhra Pradesh, Rajasthan and Maharashtra) as compared to 201' and above. In Gujarat and Tamil Nadu, the percentage of failures was higher in this (i.e. 80-125) range. In Andhra Pradesh (30%), Madhya Pradesh (37%) and Maharashtra (47%), the percentage of unsuccessful villages is

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quite high in the range of 201' and above. The explanation for Maharashtra was that the villages located in basaltic terrain are generally located in difficult hydrogeological set-up.

(It was found that the failure was 70% for wells below 80' in Maharashtra and the problems were to do with drilling - jamming of rodlines, losing some accessories, failure of flushing pumps etc.) The Madhya Pradesh report indicated that they have no geophysical data worth name.*

A further analysis of the factors for failures could help in decreasing the percentage of failures. There could be some indication of the tolerable limits of failures. The impact of the use of geophysical instrument also needs to be looked into more closely.

Number of wells and depth

The average number of wells drilled per rig was 103 in Andhra Pradesh whereas in Maharashtra, it was 44. The norm suggested in the Plan of Operation of the UNICEF is 40 wells per year (however, it is felt that this is rather low).

As can be seen from Table III, there are wide differences in the performance rate. To judge accomplishments only by the number of wells would be ignoring the geological conditions. In some

* 6" dia. borewells were found to have less percentage of unsuccessful wells (i.e. about 40 per cent) compared to 4" dia. borewells (about 60 per cent) in Maharashtra indicating obvious preference for rigs which are capable of drilling 6" dia. borewells.

areas, water may be struck at at 100' but in others it may be at about 300'.

Another measure attempted was to analyse the average depth drilled per year per rig. Substantial differences are seen here too. As between Maharashtra and Gujarat, the difference is

TABLE III

Average number of wells and average number of meters drilled per rig per year.*

State	Average number of wells per year per rig	Average depth in meters per year per rig
A.P.	103	2656
Gujarat	83	3189
Rajasthan	95	3054
Karnataka	67	6324
Madhya Pradesh	48	2267
Tamil Nadu	76	3106
Maharashtra	44	2235

almost 1000 meters. As between Maharashtra and Karnataka it is a little more than 4000 meters. The performance is

*As has been mentioned earlier there was not sufficient time to check the data. In some cases the information supplied did raise some doubts. The data given in the table is provided by the states.

comparatively low in Madhya Pradesh, Maharashtra and Andhra Pradesh whereas it is high in Karnataka, Tamil Nadu, Rajasthan and Gujarat. Here again, there are no prescribed norms and hence it is difficult to evaluate. The question is, is it possible to have a set norm with regard to the number of meters that a rig should drill per year?

The idle days per rig per year were also calculated (Table IV). The number of idle days are fewer in Tamil Nadu and Rajasthan as compared to Gujarat and Andhra Pradesh. It is significant that the number of idle days at the lowest level is about 30% and at the maximum level it is 66% of the days per year.

TABLE IV

Average days not worked
per rig per year

States	NUMBER OF DAYS IN				Total Idle days 1+2+3+4
	Movement 1	Repairs 2	Inputs 3	Others 4	
Andhra Pradesh	63	72	-	58	193
Gujarat	42	109	-	89	240
Rajasthan	37	47	35	-	119
Karnataka	89 including repairs		25	54	168
Madhya Pradesh	21	154*	-	36	175*
Maharashtra	42	70	12	66	190
Tamil Nadu	33	20	11	40	140

*100 days for monsoon have been added

The reasons listed were lack of spare parts and consequently a great deal of time lost in repairs. The monsoon accounts for a number of days varying from 20 (Andhra Pradesh) to 100 (Rajasthan and Madhya Pradesh). While in Madhya Pradesh, only 10 days are lost due to movement, 71 days are lost in Andhra Pradesh. This should call for a scrutiny of the plan - the manner in which the villages are chosen for coverage. At times, the lack of inputs due to paucity of financial requirements was also responsible for letting the rig remain idle. In Maharashtra it was observed that apart from paucity of financial inputs, the insistence on 10 per cent advance popular contribution towards the cost of borewells from the villagers acted as a bottleneck for the drilling programme and increased the number of idle days of the rigs.

The number of persons per pump

The percentage of power pumps in different states varies. In some, there are no power pumps whereas in others it is quite high (Tamil Nadu 35%). Some states did not indicate the number of power pumps, hence the data with regard to the number of persons per pump should be considered more as a pointer rather than as an accurate description (Andhra Pradesh 250, Gujarat 250, Rajasthan 724, Karnataka 1087, Madhya Pradesh 271, Tamil Nadu 390, Maharashtra 202). It is estimated that a handpump can adequately

supply water for 200 people. For power pumps, different opinions are expressed. In most states the assumption is that it would benefit a population of 1000 or so.

Table IV (a)*

Number of Successful Wells, number of pumps installed

State	No. of wells drilled	No. of pumps installed	% of pumps installed to the number of wells
Andhra Pradesh	7601	7601	100
Gujarat	2730	2730	100
Rajasthan	1433	1264	88
Karnataka	4750	3647	77
Madhya Pradesh	3651	3458	95
Maharashtra	1221	850	70
Tamil Nadu	2321	1896	82
TOTAL	23707	21446	90

There is need to have systematic data regarding the number of beneficiaries per pump. For a realistic planning, it is necessary to have a norm with regard to the number of persons which one handpump can serve.

* Table IV (a) shows the percentage of pumps installed to the number of wells drilled. In some states the time lag between drilling of a well and the installation of pump is rather high. This would explain the lower percentage of installation of pumps in some of the states as compared to other states at a given time.

ORGANIZATION

Rural water supply is a state subject. However, the centre does play an important role. The Ministry of Works and Housing is responsible for the programme at the centre. There is a Coordination Committee which consists of members from other Ministries - Agriculture, Health, Planning and Finance.

The National Committee (1961-62) had recommended the setting up of independent statutory board with adequate power to promote and finance water supply. It had also suggested the setting up of independent Public Health Engineering Department. The Estimates Committee (1972-73) noted that there had been some improvement in the position with regard to independent Public Health Engineering Department since 1960 (about 17 states have such Departments). As far as independent statutory boards are concerned, only Tamil Nadu has set it up (recently Karnataka has constituted a board for urban water supply).

In the states studied, it was noted that each of them had a separate pattern of organisation.

In Andhra Pradesh, the Rural Water Supply Programme is under the Panchayati Raj Department, in Gujarat it is under Panchayati Raj and Health Department, in Madhya Pradesh, the Public Health Department is in charge. The Rural Development Ministry is responsible for the Programme in Maharashtra. In Rajasthan, the authority in charge is Medical and Public Health Department.

In Tamil Nadu, there is a statutory body under the Rural Development and Local Administration Department.

The difference in the organization does not only relate to the Ministries or departments under which the Rural Water Supply Programme functions, but the structure of the organization itself is different. In Tamil Nadu, as indicated earlier, it is a statutory body with full financial powers. The decision regarding the programme implementation rests with TWAD. The Divisional Officer can use his discretion to operate the rigs in his jurisdiction. The Chief Engineer is in charge of the programme. Under him are many Superintendent Engineers at field levels. There are Civil and Mechanical Engineers to help the SEs. There is also a Geophysical Assistant who locates the well sites.

In Andhra Pradesh, the Department is under Panchayati Department. There is a Chief Engineer who is exclusively for implementing the developmental activities of the rural areas. Policy decisions are made by the Chief Engineer. Within the District, the District Collector is responsible for the movement of the rigs. Allocation of funds and priority rests with the Government. The Department also has a Geologist, a Geophysicist and a Hydrogeologist. There is only one Civil Engineer at the district. All others at the district and at field levels are Mechanical Engineers.

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The Public Health Engineering Department is responsible for the administration and execution of the Rural Water Supply Programme in Madhya Pradesh. The policy decisions are made at the Ministry or Government level. Details of the programme are worked-out by the Department once the policy is laid down. The Revenue Commissioner can, however, request for altering a deployment of rigs - the request is generally honoured.

The Chief Engineer and the Superintendent Engineers are responsible to the Secretary of the Department of Public Health Engineering. At the field, there is an Executive Engineer at the district and Sub-Engineer at the operational level. There are no Civil Engineers or persons trained in Geology in the set-up.

The Ground Water Surveys and Development Agency has been set up as an independent body in Maharashtra. The planning is basically done at the district level and the GSDA is involved in the decision making through the District Assistant Geologist. The decisions regarding the financial allocations are taken at the state level and the GSDA has powers to implement and shift rigs once the budget allocation is made. The GSDA has a Director. There are six divisions - survey, drilling, mechanical, administration, accounts and planning. The evaluation team made the following points:

1. GSDA is more an executing body rather than a policy making body.

2. The allocation of villages by Zilla Parishads

comes in the way of long range planning.

3. Number of technical personnel, i.e. mechanical engineers appears inadequate.

The Chief Engineer is also a Joint Secretary in the Department of Panchayat and Health at the headquarters level. There are Superintending Engineers at the different circles. Executive Engineers are at the district level. At the operational level are the junior engineers and supervisors. There are hydrogeologists at the circle level.

There are two divisions in Karnataka - one in the north and one in the south (concentration of UNICEF rigs is in north division). The Executive Engineer is in charge at the divisional level. Under him are Assistant Engineers and junior engineers at the rig level. The Administration and Accounts division are located at the divisional level. The policy decisions regarding financial allocations are finalized by the State Planning Department. The Chief Engineer at the state headquarters is in charge of both urban and rural water supply.

In Rajasthan, two major departments are involved in the Rural Water Supply Programme. The Public Health Engineering Department is in overall charge of all water schemes. The Ground Water Department drills the wells for rural water supply at the request of the Public Health Engineering Department. While the Chief Engineer of PHED is located at Jaipur, the Chief

Engineer of Rajasthan Ground Water Department is at Jodhpur. At the division and the district are Executive Engineers, Assistant Engineers and Junior Geologists. At the field level, there is a drilling foreman. The department has a survey and research wing for carrying out geophysical surveys. There is a District Development Authority consisting of Collector, MLA and other district officers which decides the schemes to be taken up. The team felt that the planning and execution of programme was rather diffused. There is need for a more integrated approach.

At the rig level, the set up was similar in all the states with the Junior Engineer in charge. The other personnel consisted of drillers, assistant drillers and helpers. There were necessary personnel for the vehicles.

The pattern of organization is very varied. It is not possible to indicate what type of organization is most functional. The basic need in the organization is for it to be able to make decisions and to implement the programme by itself. In most states, the decision making is at one level and the implementation at another level of different departments. Both in Tamil Nadu and Maharashtra, there are independent organizations. However, the experience differs. The personnel at the lower level tended to feel that they had no share in the planning process. At times, the planning could be effected by the District Collector.

The National Water Supply Committee had urged the setting up of statutory bodies. The recommendation needs to be seriously considered if the programme is to be expedited. The Estimates Committee had felt that the states should be persuaded to put the organization on a more rational footing.

Coordination at the site

Three states did not make any comments with regard to coordination (Maharashtra, Rajasthan and Gujarat). In Karnataka and Tamil Nadu, there is need for close coordination with the Revenue Department. Andhra Pradesh had indicated coordination with the Geological Survey Department. In M.P. it was stated that the District Collector acts as the coordinating authority. The other departments concerned in Madhya Pradesh are Panchayat, Social Welfare, Harijan and Tribal Welfare. Some states indicated that at the execution level (boring of wells and installation of pumps) seldom was there need for coordination.

None of the states mentioned the need for working with the Health Department. In the ultimate analysis, the programme is to result in better health conditions. Health Departments need to be closely associated with the programme. Moreover, the Health Department has organization upto the village level.

The reports give a feeling that the Organization tends to operate in isolation. If the programme is to be part of the minimum needs programme, greater efforts for association with community development, Panchayat, Agriculture, Health and

Welfare Departments are called for.

THE PROGRAMME (Fifth Plan period)

The allotment of Rs.25 crores has been made for the programme in Tamilnadu for the Fifth Plan. The target is to cover about 6,000 villages with about 7,500 bores. The state planning commission sets the target which is based on the resources available with the state as well as assistance from the centre. The criteria for the selection of villages are: (i) endemic and scarcity areas, (ii) inadequate areas. The number of villages to be covered is decided upon by the TWAD. The sites are selected by the geological assistants.

the drilling and installation of pumps is considered a composite work. The time lag is eight to ten days between the boring of the well and the installation of the pump. The maintenance is looked after by the assistant engineer.

The target for Andhra Pradesh is 10,000 villages with 12,240 bores. The Chief Engineer sets the target which is then processed by the Secretary of the Panchayati Raj Department. The state planning body is the final decision making body. The criteria for the selection of villages are the same as in Tamilnadu. There is however another category which includes "villages situated in Harijan wards and tribal areas deserving special consideration". The hydrogeologist suggests the site.

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The district collector and the revenue officer are concerned in finalising list of villages to be covered.

The department floats tenders for the purchase of hand-pumps and their installation. The time-lag is between seven to ten days for installation. The platform takes another week. The maintenance is done by the department charging Rs.50 per pump from the panchayat. No clear policy for power pumps has been laid down.

The Madhya Pradesh target is 12,500 villages. The target was set by the state government. The availability of funds, the capacity of rigs and the contractors available to execute for selection of villages are based on scarcity, inadequacy and salinity of water. The priorities are fixed by the district collector. The pumps are installed departmentally. Two weeks lapse before the pump is installed after the boring. The number of power pumps installed is negligible.

The Fifth Plan target in Maharashtra is 13,000 villages. The target set is the result of planning process involving the District Zilla Parishads through the District Planning and Development Council at one end and the State Planning Department at the other. Priority is allotted to difficult villages with upto 1,000 inhabitants. The District Water Supply Committee establishes priorities. The pumps are installed by the depart-

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ment. The time-lag for installation varies from 15 days up to three months. Zilla Parishad is responsible for the maintenance. A standard design of platform has been provided.

The Gujarat programme for the second year of the Fifth Plan was a target of 4,100 bores covering 1,100 villages. The emphasis would be supplying water to the small villages. The collector of a district was empowered to select the villages. The exact location of the well is decided by the hydrogeologist. The installation of handpumps and construction of platforms are entrusted to the private agencies - however, carting of the handpumps and the lowering of the cylinder is done by the department. The time lag between the completion of the drilling and the installation of the handpump is five to six days. The maintenance was handed over to the panchayat but did not work out well. The present proposition is to have a mechanic for fifty pumps to be financed by the district panchayat. There is a proposal to have a centralised store for spare parts required for the pump. No power pumps have been installed. Platforms with drainage are expected to be constructed. The villages are selected on the following priorities: water scarcity and no source, especially backward areas, inadequate water supply, unsafe and un-wholesome water.

In the fifth Plan Rs.8 crores has been provided for the rural water supply under the Minimum Needs Programme. Only difficult and problem villages selected by the district advisory

committee are proposed to be taken up under this programme (the type of schemes to be implemented is based on the population, for example piped water supply for villages with a population of over 5,000). The maintenance is done by the Public Health Engineering Department. It also collects revenue from the beneficiaries who have been provided with piped water. The handpumps are maintained by the Ground Water Department for which funds are transferred by the PHED.

15,000 bores are to be drilled covering 10,500 villages in Karnataka during the fifth Plan. The financial allocation is Rs 15 crores. The criteria for selection of villages are (a) no-source villages (b) villages with health problems (c) villages affected by salinity. The Public Health Engineering Department furnishes a list of problem villages for the district collector, who in consultation with the BDO and the Executive Engineer finalises the list of villages where the boreholes ought to be drilled. The geologist selects the site, but rarely are any instruments used. The Public Health Engineering Division is responsible for the installation of pump which they entrust to a contractor (the executive engineer has powers to sanction upto Rs 5 lakhs for installation of handpumps). The time lag is about a month. There is provision for the platform construction. The maintenance was being looked after by the PHE Division so far, but the proposal is to employ a mechanic for 40 pumps at the block level to be financed by the Revenue Department.

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Almost all the states have sort of perspective planning covering the fifth Plan. However, whether the resources available would allow for achieving target has not been analysed by them. The discussions with the team members indicated that the financial allotments were not in keeping with the requirements to fulfil the programmes. Some states had calculated the number of rigs that would be required by the end of the fifth Plan. All the states have indicated that the programme is to be accelerated. There is need for a "mid-term" appraisal so that realistic targets can be set keeping in view the availability of funds and equipment. The evaluation team felt that the targets set were not being achieved due to various constraints. A clear time-table for covering all the problem villages is necessary. This would however call for setting up norms of performance as well as availability of resources.

The concentration of the programme is for the installation of pumps as against the supply of power pumps for water supply. The time lag between the boring of a well and the installation varies from about a week to three months. The arrangement for the installation is also varied in different states. In some it is given on a contract basis, in others, the departments themselves are responsible. It is not possible to make a clear assessment as to which is a better arrangement. The experience in the different states differs. Usually the local bodies and/or the department is responsible for the maintenance. What the

impact of installation by the contractors on breakdown of the pumps is not known. The major factor is that the time lag between the installation and the drilling of the well should be shortened. A week to ten days should be the normal time lag. At times the delay has resulted in the abandoning of the borewells drilled as the borewells were filled with stones etc.

All the states clearly are concerned with the problem of maintenance. Different means have been tried. It continues to be a serious problem (spot studies showed that nearly 70 per cent of the pumps were not functioning at a given time). The most successful approach seems to be that of Rajasthan. The department itself has taken over the responsibility including the financial obligations.

A close study of the various schemes (one mechanic for 40 pumps, one for 50, a team with a motor-bike, a three-man team with a jeep for a block) needs to be made in terms of efficiency, expenditure, organization for spare parts, etc. The assurance of a constant supply of water must be basic objective of the programme. The WHO report also urged the need for setting up a proper maintenance of handpumps.

FINANCIAL ALLOCATIONS

The overall funds for the rural water supply budgeted in the fifth Plan is Rs 5,730 million (this as against a sum of Rs 6,500 million requested). The actual allocation in the

first two year of the plan has been much less.

The per capita expenditure for rural water supply is Rs 2.4 per annum in the fifth Plan. In the fourth plan it was Re.1 (expenditure on urban water supply is Rs 5 per capita).

There is wide variation in the amounts that different states have provided for this programme. In all the states, however, there is a continuous increase in the budget provision. The information provided here, again, is not uniform. In some cases the information is for the whole programme of rural development. In some cases the amount shown refers to the amount spent or required for operating the rigs supplied by UNICEF. The allocation as given by the different states for the period 1969-74 are as follows:

	<u>Rs in lakhs</u>
Andhra Pradesh	348
Gujarat	1,169
Rajasthan	2,090
Karnataka	367
Madhya Pradesh	184
Tamil Nadu	691
Maharashtra	1,120

The information provided is not sufficient to make a comparative analysis. It could probably be done on the basis of expenditure per capita or per village or per rig. Such calculation would require more data than is available in the present study. Moreover in some of the states there is no

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exclusive budget provision for the rural water supply. It could be part of the budget for the Minimum Needs Programme or for the whole department of Ground Water Surveys and Development Agency as in Maharashtra.

In all the states the budget allocation depends on the resources available in the states plus the funds from the Centre (only in Bihar the allocation seems to be based on the number of tubewells to be bored). There is little flexibility in re-adjusting the budget once the allotments have been made. There is wide variation with regard to the financial powers of the chief executives in the programme. The powers are different for the technical schemes, administration for tenders. In some states the chief engineer has full powers for technical schemes (approved in the budget) and for tenders. In others the Chief engineer has powers varying 2.5 lakhs to 10 lakhs, the Superintending engineer around 2 lakhs and executive engineer about Rs.50,000. For repairs in one state the chief engineer has powers upto Rs.10,000 (Karnataka) whereas in others it is as much as Rs. 1,00,000 (Madhya Pradesh).

There needs to be an analysis of the requirements of the programme and the possible expenditure. The financial powers should be based on it. In some states the powers were considered adequate by the executives (Tamil Nadu, Andhra Pradesh, Madhya Pradesh) but in others it was felt that the programme had been delayed because of lack of financial powers (Karnataka, Maharashtra, Rajasthan).

The allocation of funds is sporadic in spite of the fifth Plan budget. Consequently most states felt that it was not possible to have realistic perspective plan. Financial allocations are known at best for a year only. Often this is different from the figure mentioned in the fifth Plan, although some of the states do have "perspective plans" for the fifth Plan period. In operational terms the programme tends to be ad hoc.

Only Andhra Pradesh and Madhya Pradesh are making efforts to get assistance from international organisations like the IBRD and ADB for their programme.

EQUIPMENT

Rigs

The number of rigs owned by each of the state is given in Table V.

TABLE V

Total number of rigs in the State

State	Total number of rigs	Number of rigs supplied by UNICEF
Andhra Pradesh	46	22
Gujarat	37	12
Rajasthan	16	9
Karnataka	31	14
Madhya Pradesh	39	24
Tamil Nadu	47	13
Maharashtra	50	17
Bihar	N.A.	7
Total:	266	118

There has been a steady increase in the number of rigs in the states. The UNICEF had provided 55 rigs by the end of 1972. By the end of 1974 the number was 118. This includes 25 rigs supplied during the drought emergency in 1973 (Maharashtra-6, Gujarat-6, Madhya Pradesh-4, Rajasthan-4, and Karnataka-5). Although yearwise information is not possible for the number of rigs bought by the state, the indications are that the fleet of rigs is being continually added to. All the states except for Madhya Pradesh and Rajasthan have acquired large number of rigs of their own than those supplied by the UNICEF. This could be taken as a manifestation of the interest of the state in the programme.

The efficient performance of the rig is an important factor. As indicated earlier, there are no norms set. Moreover, the number of idle days are very high. If all the rigs on an average bore 50 wells per year, the total number of wells that can be bored in five years will be 66,500. Even if this is achieved, it will fall short of the targets mentioned in the Estimates Committee, the fifth Plan and the National Water Supply Committee - which is 1.52 lakhs. The problem could be approached from two angles - increasing the efficiency of the rigs and/or adding to the number of rigs (Karnataka had estimated that they would need more than double the number of rigs to fulfil the target*).

* The plans suggest a norm of 40 wells per year. But this is considered low. In fact, in all the states the performance is higher, Andhra Pradesh having an average of 103 wells per year per rig. The age of the rig is also to be taken into consideration while setting the norms.

Increasing the number of rigs implies that the state would be able to enhance the resources so that the necessary inputs are available for the operation of the rigs. It would also mean that the management of spare parts has to be such that the number of days in which the rigs are not working are reduced to a minimum.

Another possible solution to this is that not all the rigs are being operated by all the states at all time. There could be some arrangement with the help of CPHEEO for rigs being borrowed by the state which is in dire need. (In the severe drought-situation, Tamil Nadu did borrow rigs from other states).

Geophysical instruments

The geophysical instruments which the states have are given in the table below.

TABLE VI

The Geophysical Instruments owned by the States

	<u>Resistivity meter</u>	<u>Magneto-meter</u>	<u>Bore-logger</u>	<u>Seismic Timer</u>	<u>Water lab kits</u>	<u>Others</u>
T. Nadu	/	/	/	/	/	Terrameters from State also
M.P.	/	/	-	-	-	-
Karnataka	/	/	/	/	/	-
A.P.	/	/	/	/	/	4 Res. meter owned by state.
Gujarat	/	/	/	/	-	-
Maharashtra	/	/	/	-	-	2 Res. meter state owned.
Rajasthan	/	/	-	/	/	-

While all the states have a magnetometer and the resistivity meter, the bore logger and the seismic timer are only in five states. The bore logger and the seismic timer hardly ever used. The indications were that the magnetometer and the resistivity meter were used, but not sufficiently. These instruments can be used effec-

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tively by persons who have the necessary training in geophysics (Tamil Nadu, Andhra Pradesh and Maharashtra are the only states that have geophysicists in the department). In Karnataka, there is some coordination with the Department of Geology and Mines. In Andhra Pradesh, the percentage of successful bores drilled had increased as a result of the use of geophysical instruments.

The evaluation teams generally felt that the geophysical instruments could be used to greater advantage, but this would call for an analysis of the personnel required who need to be a part of the department.

Vehicles

The position of the support vehicles for various operations seemed generally to be satisfactory. The situation was better for the UNICEF-supplied rigs. The performance of the vehicles also evinced no complaints. However, in the case of Dodge pickups some states felt that the cost of operation was prohibitive. The other problem that was mentioned by all the states was that of acquiring spare parts for the UNICEF-supplied vehicles. In some cases no manuals have been supplied with the vehicles. The states experience great difficulty in indenting for the parts of the foreign made vehicles.

Arrangement for speedy availability of the spare parts for the vehicles has to be made. UNICEF might undertake to supply the parts. The government also could speed up the process by reconsidering the procedures for getting these parts.

There is general dissatisfaction with the arrangements for repairs of rigs. The situation was slightly better for the UNICEF-supplied rigs as there was less red-tape for them to get the parts. However, the time lag was high (the number of idle days due to lack of repairs was very large). A list of the parts required frequently could be prepared and these spare parts kept in stock (there is some effort towards this for the UNICEF-supplied rigs). Some states suggested that the UNICEF could undertake to arrange for the spare parts even for the state-owned rigs. All states reported indigenous spare parts were not satisfactory.

Apart from the availability of the parts, the arrangements for repairs were not quite adequate. In Tamil Nadu, there is one central workshop and one mobile workshop. Madhya Pradesh has three workshops which can undertake complete overhauling except for crankshaft repairs. Karnataka has one mobile workshop and one base workshop. Andhra Pradesh has a fully equipped workshop for major repairs. It also has two mobile workshops. In Gujarat, private agencies undertake repairs. It also has a mobile workshop. Maharashtra has a small workshop for minor repairs.

For getting the full value of the capital investment on rigs there is a definite need for a system that could perform the necessary repairs quickly. At present, it is calculated that the lead-time for securing the necessary parts is about 18 months.

The number of breakdowns could also be reduced substantially if the number of mobile workshops increased so that servicing is more frequent and minor repairs attended to.

The arrangement with Atlas Copco for repairs of hammers was considered satisfactory at best only for the UNICEF supplied rigs which have spare hammers. (Karnataka could not make use of the arrangements although considered good because of lack of financial powers of the executive engineer). Serious attention needs to be given for the organization of a system for speedy repairs.

THE INFORMATION SYSTEM

The items on which information is necessary for a full understanding of the situation and to analyse the progress are many. Moreover, the information collected needs to be systematic and regular. The information required would be on the following aspects:

- Geophysical
- Rig performance
- Number of wells bored and depth
- Handpump installed
- Maintenance
- Expenditure

Andhra Pradesh, Tamil Nadu and Maharashtra collect data on geophysical aspects. In Maharashtra, there is probably greater

attention paid to the geophysical aspects as compared to other states. In Gujarat, the information refers mostly to the level of water and is maintained by the Hydrogeologist.

All the states reported that the information was collected by the field level personnel, mostly the junior engineers. However, the observation of the teams was that the proformae were mostly filled in by the drillers.

The number of proformae filled differ in different states -from 27 to 6. There were some items on which there were daily reports, on others it was weekly. For the state, centre, the information was sent once a month.

Only a few states reported keeping information with regard to quality of water.

The data is collated either at the division level or the state. A couple of states (Karnataka, Maharashtra) have personnel engaged full time in statistical analysis. One state complained that while the state wants to have plenty of statistics, no statistical cell had been established.

It was reported that the data gathered was used by the states for forward planning, seeking clarifications whether progress was not in keeping with the targets set, planning for the spare parts etc. The teams did not have time to study as to whether any changes in policy or procedures had taken place, as a result of the information

gathered. The general feeling was that not much use of the data was made. At the centre, it was felt not much can be done as the water supply is a state subject.

The information as it obtains today is rather confusing. While some aspects are common on which data is gathered in all the states, there are many others which are peculiar to the state. The information will be more useful if it is uniform. The need is to analyse what is the essential data that is needed at the

- field level
- district/divisional level
- centre/UNICEF

The information needed at the central and at the UNICEF level would be minimal whereas at the district level the number of details would be more. At present, statistics seem to be collected for the sake of statistics. There is no feeling of purposiveness. The record of achievements is necessary in all programmes but the question is as to whether the quantitative data is sufficient by itself. In other words, the centre, the state (and the UNICEF) should have a clear idea as to the purpose for which they require information. Some of the states said that there is no systematic organization of information. A system can develop only when the relevance of the data is indicated to a particular objective.

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THE PERSONNEL

All the states have provided information with regard to the personnel required and their qualifications, the number in positions, the tenure, training and incentives.

The organization set up is different in the states. Consequently, the personnel required would be in keeping with the pattern of organization. All the states reported that all positions were filled, i.e. 100% staff, both technical and non-technical, were in position.

For similar posts, the qualifications prescribed were not the same in all the states. This was partly due to the nonavailability of persons with high qualifications. The recruitment of technical and gazetted posts is done by the state Public Service Commission in most states. In one of the states, there is a Recruitment Committee. In Gujarat, the non-technical personnel are selected by the District Collector.

In most states, there is no tenure for the personnel (M.P., Gujarat, Bihar). A couple of states (Andhra Pradesh, Karnataka, Tamil Nadu) indicated that the persons recruited on temporary basis are to be made permanent. The states are dependent on the centre for their funds. Consequently, the personnel are recruited for the period of the grant. Mobility was mentioned in a few cases particularly of the technical personnel.

The salary scale was different for the same posts. In only two states (Andhra Pradesh and Karnataka), some incentives were given (50 paise per foot over 1000' per month in Andhra Pradesh. 0.22 in Karnataka per foot for more than 1500') for the rig crew except for the junior engineers.

There are three areas in which positive action is needed: (1) training of personnel at all levels (2) some form of incentives including accidental insurance, clothing allowance, hardship etc (3) tenure.

PEOPLE'PARTICIPATION

The picture regarding the people's participation is dismal. The organization is dominated by the technical aspect of the programme. It is more concerned with technical competence than arousing community participation. This is in a way understandable. Most states admitted that the organizational pattern did not enable them to elicit community participation. In fact, few states have given serious thought to the manner in which to involve people in the programme. Where there have been efforts at getting contributions from the villagers, the results have not been encouraging.

In Maharashtra, it was stipulated that unless the villagers contributed 10% of the cost, no wells will be bored, the result was that the programme was slowed down a great deal. In Madhya Pradesh, there is a graded levy -

nothing for the village with a population of less than 500, 25% for villages with more than 4000 population.

In Andhra Pradesh, the villagers contribute Rs.50/- per pump per year. In Bihar, the people who contribute (upper castes) tended to treat the pump as their private property.

Most states have experimented with making Panchayats responsible for the maintenance of pumps - the experiences have been disappointing. The people, when questioned, said that even after complaints, no action is taken and so they just do not bother (however, where there was no alternate source of water, the maintenance is said to be better).

The organization as it is now is not geared to undertake community education. It is essentially a technical department. There will have to be coordination with other departments like community development and health, whose functionaries have a direct relation with the public.

Part of the problem is that the advantages of potable water cannot be easily demonstrated. The situation is all the more problematic when there is no assurance of continuous supply of potable water. The economic advantages cannot also be indicated in any tangible terms. Involving the community is a slow process but serious thought has to be given as to the measures to be adopted for educating the community particularly with regard to the relation between health and potable water. The experiment being carried

out in Tamil Nadu on the process of communication with regard to the water supply programme needs to be followed carefully.

Another area which needs thought to be given is the location of pump. It was found that the handpump if located in the Harijan area is not used by upper castes groups and vice-versa. The two states (Tamil Nadu & Rajasthan) in operation provide for two pumps per village, one for the Harijan area and one for the upper castes. Most states said that as a policy, they take up villages which have a predominant population of Harijans (this is yet to be validated). Most states also agreed that to expect financial contributions from the Harijans or the tribals would be unrealistic. There is little that the community can do by way of contributing labour as the operations are mostly technical. The problem is knotty. It can be tackled only when there is more integrated approach which would involve the school, the primary health centre, the Panchayat and may be the Revenue Department.

Such a programme needs vision and sustained drive for its success. The technical aspects in the survey, design, preparation of plans and estimates for a variety of rural schemes in the different regions of the country call for a comprehensive grasp of the rural needs and resources, and competence to evolve the simple as well as complex types of

schemes in the most economical manner, to suit local conditions. The financial and administrative aspects of the programme call for skill in drawing the best out of the villagers as their own contribution, so as to get them involved and interested in the programme, and in organising the planning, execution, and maintenance of all works in a manner whereby responsibility for action and results will be undivided, and progress made could be evaluated at all times.

The statement was made by the National Water Supply and Sanitation Committee in 1961. The statement is equally applicable to the programme in 1975.

SUMMARY AND CONCLUSIONS

The purpose of the evaluation team was to appraise of the progress of the programme for supplying drinking water to the rural areas. A team consisting of nine members was divided into sub-teams of three each and they visited various states and collected information on the basis of a guideline that was worked out on the areas of enquiry. It was hoped that such an approach would provide data for a comparative analysis. The hopes were not fully fulfilled but the data was similar enough to make a comparative approach. The data was not sufficient to draw definite conclusions. However, it was adequate to sensitize the areas that need to be considered by the State Government and the Central Government.

RECOMMENDATIONS

1. Considering the numerous problems in providing water supply to the problem villages in the country and taking into consideration the existing procedures of implementation of the Rural Water Supply Programme the team recommends:

- a) that considerable advance planning for the location of bores in the problem villages should be carried out, preferably one season in advance;
- b) that proper hydrogeological, geo-physical and site surveys be carried out before the rigs are moved to the sites where bores are to be drilled;
- c) that the priority in the selection of villages where bores are to be provided be decided at 'Block Samiti' or 'Block Union' level, keeping the national criteria in view
- d) that full coordination between the Health, Public Health Engineering and Community Development Departments should be established in the implementation of the programme from the planning stage;
- e) that the Health Department be made responsible for monitoring the quality of water supplied/made available, as a routine measure, to ensure provision of safe water to the community.

2. Considering the present set-up for the implementation of the water supply and sanitation programme in the different States of the country, the team recommends:

that strong consideration be given to the formulation of Water Supply and Drainage Boards in all the States with adequate powers for the implementation of the different programmes. The Team further recommends that a separate wing within such a board, headed by an official of the rank of Chief Engineer, with adequate staff, be established for implementing the Rural Water Supply Programme.

3. Taking into consideration:

- i) the present procedure of allocation of finance for the implementation of the programme which is normally indicated at the beginning of the financial year;
- ii) the actual number of rigs available in the various States for the implementation of the Rural Water Supply Programme.

The team recommends:

- a) that advance indication of finances likely to be allotted for a period of not less than 2 years should be made available to the concerned authorities to enable them to plan the programme of implementation, recruitment and training of personnel, etc. needed based on such indications;
- b) that adequate funds should be provided to enable optimum utilisation of the available rigs with the States.

4. Considering the performance of the drilling rigs in the different States and keeping in view the Master Plan of operation for the UNICEF/WHO assisted Rural Water Supply programme--

The Team recommends:

- a) that norms relating to the performance of rigs should be established in terms of the number of hours worked during the year. The team is, however, of the opinion that due consideration should be given for the type, age and the level of maintenance of the equipment as well as the geological formation encountered for establishing such norms. It further recommends that the norms should be jointly agreed to by the States, Government of India and UNICEF.
- b) that handpumps should be fitted on the completed bores with the least possible time lag, which in any case, should not exceed 4 weeks;
- c) that the handpumps should be finished with a platform and proper drainage arrangements with a soakpit. The work should form part of the handpump installation.

5. Considering the extent of the drinking water problem in the country, the team feels that provision of handpump on a borewell represents an economical and speedy answer to the problem. However, considering the main shortcomings in the operation and maintenance of handpumps at present, the team strongly recommends:

- a) that efforts towards evolving the most suitable design for a sturdier deep well handpump on the lines already made by Government in collaboration with WHO/UNICEF should be intensified;
- b) that day-to-day maintenance of the handpumps should be made the responsibility of the community. The team feels this responsibility could be entrusted to an individual from within the community for whom a nominal honorarium could be paid, and who receives some basic instructions for the day-to-day maintenance;
- c) that advanced repair and maintenance (like changing cylinders, repair of the rods etc.) should be carried out by qualified and trained mechanics or a team of mechanics. The team feels that the provision of a mechanic at block level would be the best solution.
- d) that the financial requirements for the above maintenance procedure be met by the Panchayats/Panchayat Unions;
- e) that 'Inspection Wings' be established within the States to ensure the quality and sturdiness of the handpumps used under the programme.

6. Considering the need to optimize existing resources (both manpower and equipment) for the speedy implementation of the programme, the team recommends:

- a) that adequate number of geophysical equipment should be made available for proper selection of site for the bores. The available geophysical equipment should be utilised by employing trained persons.
- b) that for optimum utilization the geologists, geophysicist and the geophysical equipment should be attached with the department implementing the rig programme;

7. i) Taking into consideration the total number and different types of rigs, accessories and other equipment under operation in the country,
- ii) Noting that the Government of India have recently approved the establishment of a Central Stores Management Cell for UNICEF stores at Bombay,
- iii) Realising that supply of adequate spare parts in time is essential for proper implementation of the programme,
- iv) Noting that UNICEF have agreed to supply imported spare parts, if needed, for State owned rigs in addition to rigs supplied by UNICEF,
- v) Realising the limitations of the type of rigs now available with reference to geological formations in some specific areas in the country,

the team recommends -

- a) that the management for procedures of indenting, allocations, distribution and delivery of the stores/spare parts be streamlined, as many of the other recommendations made in this report have direct bearing on adequate and timely supply of spares/stores;
- b) that Central Stores be established in the States where it is not existing at present for the management of spare parts;
- c) that facilities for repair, periodical maintenance of rigs, overhauling of accessories and transport vehicles etc. be provided. The team further recommends that this can be done after considering the relative merits and disadvantages of central workshops, mobile workshops and mobile mechanics;
- d) that rigs of higher capacity capable of drilling upto 500 to 600 ft. be made available to specific areas where drilling to such depths is necessary.

8. Considering that training of the personnel employed in the various State agencies for executing the Rural Water Supply Programme should be given importance in order to maximize the use of available resources, the team recommends that existing training programmes, which at present, are inadequate to meet the

requirements of the programme in the country be expanded. The proposed training should include programmes for drilling crew engineers, hard-rock drillers, drilling rig maintenance mechanics, handpump maintenance instructors, hydrogeologists/geo-physicists and also courses for the managerial personnel.

9. Considering the importance of peoples' participation in attaining the programme for its success in the objective of providing safe drinking water to the community, team recommends:

that the Health and Community Development Departments should be involved in motivating and educating the people for their participation, at all stages of the programme.

10. Taking into consideration the present system of providing information with regard to the progress of implementation, the programme, the team recommends:

that the data to be furnished should be planned for specific use for a proper assessment of the progress, and as a basis for taking corrective action. Simple proformae which can be understood by the lowest category of staff working in the field need to be developed to enable them to furnish the necessary basic data. The team further feels that all the information collected at the field level need not be transmitted to the State/Central organisations which are responsible for monitoring the programme but can be distilled as necessary. The team feels that strengthening of the State/Centre departments for this purpose may be considered.

11. Recognising that evaluation of any programme is a periodic process, the team recommends that a preliminary study with regard to the impact of the programme should be taken up in one or two States immediately or at the beginning of the third year of the fifth Plan with a view to developing a design and methodology which could then be extended to other States if

necessary. Such a study would naturally have to be in greater depth of the various areas which the present team has highlighted. As such a 'study in depth' cannot be undertaken by an ad-hoc team like the present one, the team recommends that it be entrusted to a team or teams involving specialists in relevant disciplines in order to make the study meaningful. The composition of this team and its terms of reference as well as the broad design of the evaluation may be as approved by a joint committee of the Government of India, WHO and UNICEF.

12. The team while recognising the definitive role to be played by the Centre in guiding, coordinating, and dissemination of information, suggests closer cooperation between the Centre and the Departments of the States for fulfilling the objectives in view. The team feels that there is genuine need for expansion of the Central Organization to meet the demands on it with success.

23 April 1976

An Evaluation of Rural Water Supply

The questions that are now being suggested have to be considered along with the earlier note "Areas of Enquiry for the Evaluation Team". The present set of questions are a little more specific than in the earlier note but the questions in both are relevant. The team would have to study B and C of the broad objectives and B and D of the specific objectives. (Refer to page 2 and 3 of the earlier note).

The team will have to collect information through

- i) proforma sent by the team
- ii) discussions with the officials at the state and district level
- iii) field visits at the district level.

The team might decide to spend more time in a district to get specific data so as to get insights into the functioning of the programme. (Some proformas have been suggested. Team might want to have more proformas).

Some of the questions that are being asked are of factual nature. The information has to be collected from the state and the district levels. Some of the other questions call for an assessment of the situation. The team has to give its own view after having collected the data.

It may also be mentioned here that the data for different aspects will have to be collected at different levels - e.g. information on policy will have to be got from the Secretary/Minister concerned, organisation and programme from the Chief Engineer, operational data from the Executive Engineer, etc.

Some of the areas and some specific questions have been suggested in the following pages. It may be emphasised that these questions are only lead questions and further questions could arise out of the information given to these questions.

Background Information

Number of problems villages to be classified under:

- (a) No source
- (b) Health
- (c) Salinity, iron, fluoride

Number of villages in hardrock-area in each of the category (see table III)

Historical Background of the Programme (With a view to understand the emergence of the present programme)

Has the programme considered provision of irrigation for food production?

What is the impact of the drought in the last 5 years? (Information to be got on specific districts)

Programme

What are the targets for the Fifth Five Year Plan?

Who set the targets?

What is the basis/rationale of the setting the targets?

What was the data available with regard to the geological factors, equipment aspects, accessibility of the villages, political pressure in determining the targets?

What were the criteria for deciding on the priorities for the location of wells? Were these priorities kept to? If not, why not? (This question will require probing)

Who are involved in the selection of the villages and where the wells are to be drilled?

What are the arrangements for installing the pumps?

What was the average time-lag between the drilling of the well and installation of pumps? What are the reasons for the gap?

What are the arrangements for the maintenance and repairs of the pumps?

What is the policy with regard to the construction of platform and drainage of waste water?

What is the percentage of power-pumps supplied as compared to the hand-pumps installed?

What is the experience with regard to the functioning and maintenance of power pumps?

Accomplishment

What is the number of wells drilled?

(This should be classified yearwise as well as by depth - 80-100, 100-125, 126-150 and 151-200, 201 + - from the beginning of IV Plan). (See table I)

The number of villages covered. The number of pumps installed. The population covered. Number of platforms constructed.

If the data is available, information should be got on whether the geological data was available for selecting the site for drilling wells. What is the number of successful wells drilled and unsuccessful wells when such information was available. As mentioned earlier, the data should be tabulated yearwise from the beginning of the Fourth Plan. It would be better if the information is collected district-wise. (The proforma does not provide for districtwise data).

Policy

What is the policy of the state with regard to the rural water supply? Does it have a perspective plan?

What part has the state in evolving a national policy? Does the state have any suggestion with regard to the changes in national policy?

How does the state policy dovetail into other programmes such as - community development, minimum needs, irrigation etc.?

Does the team consider the policy adequate to meet the needs of the state?

Organisation

What is the organisational set up in the state (under what department?) (Make a chart of the organisational set up)

What are the linkages with the other concerned departments?

At what level are the policy decisions regarding financial matters, programme implementation etc. taken (e.g. can the rig be moved without the permission of the Commissioner?)

How is co-ordination affected?

- (a) within the organisation
- (b) with other organisation related to the programme - (health, panchayati raj, geology and mines, public works etc.)

What is the organisational set up for the maintenance of the pumps?

Is the organisation such it can undertake community education and evoke community participation?

Allocation of Resources

What is the allocation of resources by the state to the programme (information to be got yearwise from the beginning of IV Plan to-date)? (See table II).

What is the basis of budget allocation?

What is the break-up of the budget (establishment, equipment, transport, operational cost etc.)?

(It would be useful to have the information on the budgeted amount and the expended amount yearwise under this break-up).

- What changes are needed to make the functioning of the workshops more efficient?

Information System

- On what aspects is the data collected? Does the State feel that all items are adequately covered? If not, what more information is needed?
- Who collects the data?
- How is it collected?
- Who collates it? Are personnel engaged on this full time?
- What is the periodicity?
- What use is made of the information at the division and the state levels (also at the centre and UNICEF)?
- What is the total number of proformas that are filled in (how many for the state, the centre, the UNICEF, Etc.)?
- What is the attitude of the state regarding the collection of the statistics?
- What is the type of information available with regard to geo-physical conditions in the state. What use is made of this by the Department?

Personnel

- What is the requirement of staff? (See table IV)
- How are the staff recruited?
- Do they have tenure?
- Is there a training programme? If so, how is the selection for the training done? How many have been trained and in what aspects? (Geophysical, drilling, repair of rigs, etc.)
- What are the promotional policies, if any?
- What incentives are given to maintain morale and discipline (hardship allowance, accident insurance, etc.)?

(There is need to discuss the overall personnel policy)

People's Participation

- What is the contribution expected from the people?
- What is the experience of the state in getting the people's contribution and participation?
- What are the programmes and plans in getting the participation of the people?
- Is there any policy with regard to supplying of pumps to areas of the village which have predominant population of the scheduled castes?

Dr A.P. Barnabas

14 June 1975

What are the financial powers of the Chief Engineer, Executive Engineer and Superintending Engineer?

Do the resources allocated allow for perspective planning?

Has the state approached international organisations like IBRD or ADB for financial assistance?

Is the budget flexible and does it allow for transfer of funds from one head to another?

Equipment:

1. Total number of rigs, type, age, etc. (see proforma Table V)
2. a) Pumps - Number of handpumps installed, type (Jalna, Sholapur, etc.,)
 - cost of each
 - performance of each type
 - yield of water by type of pumps
 - most frequent problems by type (handle, cylinder, chain, etc.)
 - the time lag between drilling and installation of pumps
 - arrangements for repairs and maintenance
- b) Power pumps
 - When is a power pump supplied? (population, depth of well etc.)
 - What is the cost of its installation?
 - What are the arrangements for maintenance and repair?
 - What is the maintenance cost, how is it met?
 - Performance assessment.
3. Other equipment
 - What other equipment does the state have such as, hydrogeological, geophysical, etc.?
(well logger - seismic meters, etc.)
 - Who supplied these, what is the cost?

- What use is made by the department of this equipment?
- What advantages have accrued by its use?
- If not used, why were they not used?
- Does the state maintain any records of the use and results of the geophysical data. If yes, collect summary data.

4. Vehicles

- What is the number of support vehicles?
- Does each rig have one support vehicle?
If not, how is the working of the rig affected?
- What has the state done to overcome any inadequacy of support vehicles?
- Are there any problems with regard to inputs, repairs, obtaining spare parts for foreign vehicles, etc.?
- General assessment of the performance of the vehicles.

5. Repairs and spare parts

- What are the arrangement for repairs (workshop, etc?)
- What are the spare parts frequently required?
- What is the performance of the spare parts indigenously manufactured?
- What is the lead time required for acquisition of spare parts?
- What is the idle time due to lack of spare parts?
- What is the view of the state with regard to the latest arrangements made for repairs of hammers, compressors, etc. (Arrangements with Atlas Copco, etc.)
- Does the state have a workshop? If yes, what are the functions performed by it? What advantages have the state gained by the existence of the workshop in the state? (Less time for repairs, obtaining of spare parts, etc.)

TABLE III

Problem Villages

	No source	Health	Salinity, Iron etc.	Total
1. Total number of villages				
2. Number of villages covered upto 31.3.1975				
3. Number of villages in hard rock areas				
4. Number of hard rock villages covered				

TABLE IV(A)

Personnel (Technical)

	Designation*	Prescribed qualification	Number required	Number in position
HQ				
Division and Dist. HQ				
Field level				

*Starting from Chief Engineer to Helper at the rig site.

TABLE IV (B)

Personnel (Non-technical)

	Designation	Number required	Number in position
HQ			
Division and Dist. HQ			
Field level			

TABLE IV (C)-1

Personnel - Workshop

Technical

Designation	Prescribed qualification	Number required	Number in position	Number fulfilling qualifications

TABLE IV (C)-2

Personnel - Workshop

Non-technical

Designation	Number required	Number in position

TABLE V

Rig Performance

Rig I Rig II Rig III ... Rig x

Type of rig

Date of commission

Total Number of
wells drilled:

Average number per
year

Total footage
drilled:

Average footage
per year

Average idle time per year
(Movement
(
(Repairs
(
(No. inputs
((oil, etc.)
(
(Others
((specify)

Maximum
footage
drilled:

TABLE V(A)

Total No. of Rigs

Age of rig	Number of rigs	Number in working condition
1 - 2 years		
3 - 4 years		
5 - 6 years		
7 - 8 years		
9 years and more		
Total		