[Various papers distributed at the National Workshop on Operation and Maintenance of Rural Water Supply and Sanitation Systems, New Delhi, September 25-27, 1996]

Rajiv Gandhi National Drinking Water Mission
New Delhi, India

Contents:

APPROACH PAPER
ON
COMMUNITY BASED WATER QUALITY SURVEILLANCE
FOR
RURAL INDIA

For presentation at the
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Operation & Maintenance of
Rural Water Supply & Sanitation Programme

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The seemingly impossible task of regular water quality monitoring of all water sources throughout rural India alongwith disinfection and minor remedial measures can be easily achieved by the investment of a meagre amount of Re.1.30 per capita by the Government and the beneficiaries contribution of Re.1.11 per capita per annum.

Approach Paper
on
Community Based Water Quality Surveillance for Rural India

BACKGROUND :

More than a century after John Snow identified a handpump in Broad Street, London as the prime source of cholera epidemic then raging through the area, supplying safe water to all still remains an elusive target in most communities, particularly in the developing world.

The rural population of India are suffering the most from microbial and sometimes chemical contamination of drinking water. Their numbers are extremely high and increasing at a rate which makes it extremely difficult for water supply and sanitation programmes to achieve significant improvements over and above demographic developments.

Although it is quite obvious that pathogen contaminated drinking water is a prime source of infection, it is equally true that insufficient availability of water also hampers people's efforts to practice better personal and domestic hygiene. The inevitable consequence is high diarrhoeal and skin disease incidences. Naturally, in the last few decades the thrust of the national policies had been to supply adequate or at best, optimum quantity of water to all the population.

In recent times, improvement in water supply and sanitation, particularly in rural areas, has been emphasised and a definite increment in the status of drinking water supply has been achieved. But still there has not been any remarkable improvement in the health status of the rural population and water borne diseases continue to remain the single most important cause of morbidity and mortality. The recurrent epidemics of enteric and other gastro-intestinal diseases in different corners of our country bear evidence to this.

It would be highly modest to state that ensuring "safe" water supply to the rural population of India is a difficult target. It is a goal which is extremely difficult to achieve, and there are numerous barriers which have to be surpassed. Though it may sound over-optimistic, the hurdles are however, not unsurmountable.

But the existing infrastructural facilities can not cope up with the huge task of a continuous surveillance programme throughout rural India. The present water testing facilities, concentrated in the cities and in some district headquarters, are far less than adequate and the few city-based technical personnel in the relevant Government organisations can not be expected to cover the target of regular water testing of all the water sources. In a country like ours, the only viable option appears to be a **community based water quality management system** which can ensure safe water supply.

APPROACH :

The Pilot Project :

As it is increasingly felt that in the rural areas of the country water quality surveillance systems were urgently required, a R&D project was launched by the All India Institute of Hygiene & Public Health (AIIH&PH) in collaboration with UNICEF, Calcutta Field Office in 1993 with the objective of evolving a participatory model of community based water quality surveillance and monitoring system. It was proposed that the surveillance team would be developed with the Anganwadi workers of the ICDS programme, Panchayat functionaries, local NGOs and the water supply authorities, alongwith the active participation of the communities.

A baseline survey was carried out in five blocks of Medinipur district, where the intensive rural water supply and sanitation programme was ongoing following CDD-WATSAN strategy, to study the existing water supply status; the water use patterns; water related knowledge, attitude and practices (KAP) of the people.

It was obvious that such a programme could not be feasible without an appropriate water quality field test kit which could be easily handled by the village level grass-root workers. Different types of water quality field test kits had already been developed by various organisations / agencies, which are

portable and much simpler than the sophisticated laboratory instruments. But these had hitherto been used only for training purposes and none of the models had been operated by the grass-root workers at the village level. As such, the deficiencies of the existing models, as regards to their operational simplicity by the village level operators, were never evaluated. also there was a lack of training link between the trainers and the grass-root level workers.

Keeping the above mentioned limitations in mind, a low cost and user friendly water quality field test kit was developed by the Sanitary Engineering Department of AIIH&PH, which was subsequently tested in the project area.

An institutional analysis was also carried out before organising the surveillance teams and the surveillance network. The project was so designed to give the Anganwadi workers (AWW), who also enjoy the most intimate contact with all the mothers in their respective villages to spread the safe water, health & personal hygiene related messages ("mothers are the health teachers of the family"); the total responsibility of carrying out regular monitoring of water sources. This pilot project was launched in a cluster of 11 villages in Daspur-I block in Medinipur district (West Bengal).

Mass awareness camps were organised in the project areas with the active participation of the community, local youth clubs, Panchayat and ICDS functionaries and staffs of other relevant governments. Appropriate training was imparted to the AWWs regarding survey methodologies, water quality testing procedures and handling of field kits. Each AWW was supplied with a field kit developed by AIIH&PH and other different models manufactured by various organisations / institutions within the country.

The trained AWWs started their activities in the 11 villages of Daspur-I block during early 1993 under the close supervision of scientists-cum-trainers of AIIH&PH. A total of 71 community water sources covering 11 villages were regularly monitored. AWWs were supplied standardised schedules where they recorded the test results and submitted the reports every month to the CDPO (Child Development Project Officer). During this period all the other models of field kits, manufactured by various organisations / institutions, were rotated every three months among all the AWWs so that all of them get equal opportunity to work with all the different models of the field kits independently. From the participatory evaluation results of all the different field kits, the AIIH&PH designed kit was also modified accordingly to make it more user friendly. As many of the villages did not have electricity, an alternative to electrically powered incubator was urgently needed. So a model of **kerosene**

lamp powered Incubator was developed through extensive R&D work at the Institute, which has since proved very successful at the village level.

After a period of one year, the whole programme was reviewed jointly by the government authorities (PHED and SWD) including the district administration, ICDS and Panchayat functionaries, and there was an unanimous agreement on the feasibility of such a model. It was proposed that the model project would be replicated in 20 ICDS blocksof Medinipur district and all the concerned governement and non-government agencies agreed to full and active co-operation in this regard.

During the R&D project, the performance of the newly developed water quality field test kit was constantly monitored by comparing the water quality test results carried out at the field level using the field test kit and also at the laboratory with 98.2% matching results.

Major findings and achievements of the Pilot Project :

* *Development of low cost user-friendly water testing field kit,*
* *Success of community based approach of water quality surveillance in a pilot scale,*
* *Development of a model of community based surveillance system, and*
* *Feasibility of replication of the model in a larger area.*

REPLICATION :

The successful completion of the above mentioned pilot project highlighted the need for replicating the model on a larger scale to test the viability of such a system in diverse socio-cultural environments and on a country-wide scale, with linkage to existing institutional set-ups. It was also proposed that other than regular monitoring of the water sources, an efficient intervention-cum-remedial network infrastructure be developed, also in participatory approach with the added involvement of Panchayat functionaries

and relevant government organisations. As such a second project was undertaken with the aim of examining the economic viability and social sustainability of the model of community based water quality surveillance with an appropriate communication-cum-rapid action intervention network to develop an efficient and sustainable rural water quality management system at the grass-root level.

The project was undertaken in 20 ICDS blocks in Medinipur district, with five or more Anganwadi Centers in each block. The key persons in this monitoring-cum-intervention programme were the Anganwadi workers.

In the first phase of the project, training courses were organised in each of the 20 blocks, where the main participants were Anganwadi workers, and their Supervisors & Helpers, village level Health workers, Primary school teachers, local youth club volunteers and the Gram-Panchayat level functionaries, etc., who were supposed to form the Village Level (water) Committees (VLC).

Each VLC was provided with its own water quality field test kit to monitor in an average of 15 to 20 public water sources in their respective areas. They were also encouraged to test water quality of any private sources as well after collection of a fixed amount, usually Rs.10/- per sample.

A "three-tier" model was developed with active co-operation and help of Panchayat functionaries, NGO and government organisations at the district level. The key persons at the village level (first tier) were trained and given the responsibility of carrying out minor remedial actions whenever any fault or deficiency was detected in the water quality.

The key persons were also trained to diagnose the magnitude of remedial action, if necessary. If the remedial action was assessed to be more than a minor one, the Panchayat Samity at the block level (second tier) was immediately informed of the same. Three persons per block from among the Panchayat functionaries, alongwith the RWS Engineer, were selected and trained, as well as given the responsibility of carrying remedial actions of a moderate magnitude.

If the remedial action necessary was found to be of a still bigger magnitude, the Zilla Parishad at the district level (third tier) was immediately informed about the same where the District Engineer and the PHED Engineers were adequately trained and equipped to carry out any major remedial actions.

In this project people spontaneously showed great response. The easy operation yet simplicity of the field test kit caught the imagination of all the participants proving its high degree of efficacy.

Impact of the Project on Community :

It was experienced that implementation of this water quality surveillance programme could certainly create a positive impact on the community as a whole and it was most heartening to note a discernible change in villager's perception about safe drinking water and awareness about importance of water quality testing for their own well being, which had been reflected in their coming forward for a financial contribution **en masse.**

It must be emphasised that a lot of interset could be generated amongst the beneficiaries of the project villages and they were found to be eager to be involved in the whole process. This was thought to be partly due to the already felt need of the villagers for safe water and partly due to the involvement of grass-root level workers in the functioning of the project, i.e., Anganwadi and Health workers, members of local clubs, mahila samities, teachers, etc.

The spontaneous interest generated amongst the residents in the area where training camps were organised or the programme was impl[illegible], was reflected through the ample media coverage wherein they were [illegible]vide publicity.

Community Contribution & Revolving Fund :

VLC members were appraised of the need for raising funds for making the programme self-reliant and self-sustaining. It was ideally conceived that without any financial contribution on part of the villagers no such rogramme could be successful. This was thought to help develop the much desired "sense of belonging" and a demand for safe water amongst the user community. The people were motivated to contribute @ Re.1/- per family per month (i.e., Rs.12/- per family per year) to create a revolving fund to be utilised towards the refilling cost of reagents (which is Rs.1,200/- for chemicals and Rs.500/- for bacteriological strips), bleaching powder (when in short supply), and annuity for the field kit.

Institutionalisation of Community Contribution :

The community contribution strategy for self-sustenance of the project at the village level was a regular topic of discussion in the weekly meetings at the Anganwadi Centers, Panchayat Offices as well as, in the village contact drive meetings / discussions. Being convinced of the possible outcome of the present project, people in most areas either came forward with a token financial contribution or principally agreed to contribute. **The CDPOs issued formal orders for opening of Savings Bank Account in the local Post offices or Rural Banks.** It was most encouraging to note that in some cases sufficient funds could be generated in a very short time which, in turn, were utilised for the purchase of refills, etc. resulting in self-sustainability of the entire programme.

Major findings and achievements during programme implementation period :

* *Grass-root workers (VLC members) were trained to use the field kit proficiently,*
* *VLC members were also trained to undertake remedial measures, especially disinfection of water sources,*
* *The programme had a positive impact on the community creating the much desired awareness about safe water and the importance of water quality testing,*
* *Simultaneously with the training programme and awareness campaigns the communication-cum-intervention network had been built-up,*
* *The programme, though implemented in only 20 ICDS blocks, had amply demonstrated its replicability and emerged as one of the viable alternatives for providing safe water to the community and thus improving public health,*
* *That any community based programme should necessarily be a participatory one in order to make it successful and sustainable was evident,*

- *Studies have been initiated to find out whether there had been any improvement in public health due to the improvement in water quality surveillance programme; however, prima facie it appeared that there was a decreasing trend of diarrhoea and other water borne diseases,*

- *This model could be replicated all over the country with minimum support but lot of enthusiasm from the government authorities.*

A SUSTAINABLE AND COMMUNITY BASED APPROACH FOR WATER QUALITY SURVEILLANCE IN RURAL INDIA :

The pilot studies conducted by AIIH&PH in collaboration with UNICEF, Calcutta Field Office helped to make the following observations :

(i) *With proper user-friendly water quality field test kits, community grass-root members could easily assess the water quality with respect to potability of water.*

(ii) *If the community could be empowered sufficiently to comprehend the relation between water quality and health, the programme would be sustainable both socially and economically.*

The observations of the pilot project and it's subsequent replication in a comparatively smaller scale helped to formulate the present proposal for a *nation-wide community based water quality surveillance programme.*

Water Quality Field Test Kit :

The low cost and user-friendly water quality field test kit has been developed keeping in mind the disadvantages of the existing ones so that it could be manufactured locally and **the chemicals required as reagents, detailed as given the manual, could be procured from the local chemical**

shops wihout dependence on the original manufacturer (of the field kit). The field kit also has a **separate kerosene lamp powered incubator for operation at the village level.** Even the **container bag** has also been designed in such a way that it **can be easily carried by both male and female workers.**

The following water quality parameters can be analysed by this field kit

(i)	**Turbidity,**	(ii)	**pH,**	(iii)	**Hardness,**
(iv)	**Chloride,**	(v)	**Iron,**	(vi)	**Nitrate,**
(vii)	**Fluoride,**	(viii)	**Residual Chlorine,**		
(ix)	**Arsenic,**	(x)	**Bacteriological quality.**		

Human Resource Development :

There are 516 districts in India. For this programme 3 to 4 key persons from each district would be identified and trained to become "District Level Key Trainers" (DLKT) of the districts. The state and the district administration would select the DLKTs, who may be College Teacher, NSS / NGO volunteer, Engineers from PHED / Zilla Parishad, Medical Officer, District Planning Officer, etc.

DLKTs would be responsible for training of "Block Level Key Trainers" (BLKT). At least 5 ersons from each block would be trained. The members of the BLKTs would preferably be NGO / NSS volunteers. District authorities, in consultation with the BDO or other responsible Block level officers would select the BLKTs.

The BLKT groups in turn would train the village based grass-root workers. One person would be trained from each village. These persons may be Anganwadi worker, Health worker, Auxiliary Nurse Midwife, Panchayat member, Local youth club member, etc.

Training :

About 2,000 DLKTs identified from all the districts of the country need to be trained initially. These trainings can be organised by the respective and appropriate state level institute, viz., SIRD (State Institute of Rural Development), TTI (Teachers Training Institute) or any Engineering College / Polytechnic, for two days each course with 40 - 50 articipants. These training courses for DLKTs would require approx. 5 months.

BLKTs would be trained by DLKTs in the respective districts. About 55,000 BLKTs would be required to be trained for covering all the blocks in the country. Considering 50 articipants per course, there would be 11 thousand courses which may be held simultaneously. All the identified BLKTs would be trained approx. within a period of 4 months.

The BLKTs in turn would simultaneously start training the grass-root level workers, the total number of which would be around 5,76,000 for all the villages. Each training would be of two days duration. At least 40 training courses could be conducted simultaneously, each course having 50 participants.

Thus a total of 11,520 (5,76,000/50) training courses would be required to be conducted by the 55,000 BLKTs.

If 40 training courses are conducted simultaneously, a total of 560 to 600 trainig days would be required. Taking other factors into cosideration (like travel, etc.), approx. 23 months would be required for completion of training activities.

Course contents :

Basic contents for the training courses would be :

(a) Water, Sanitation & Health linkages,

(b) Demonstration of Field Test Kit operation,

(c) Disinfection of tubewells, dugwells and ponds,

(d) Methodology for development of rapid communication and intervention network.

Though sanitation intervention is not a directly related component of this project, the training courses would try to develop sanitation awareness among the community.

Programme Implementation :

Grass-root workers (GRW) would analyse the water quaity of all the community water supply sources, at least 4 times in a year, and as and when required. In situations of water quality problems particularly in cases of deterioration of bacteriological water quality, they would take steps to disinfect the sources. In cases of chemical contamination GRWs would immediately inform the Block level Liason Officer (eg., BDO or RWS Engineer). If the problem is a major one, information would now be transmitted to District Level Co-ordinator (eg., CMOH, or District Engineer, Zilla Parishad / PHED). A Surveillance Co-ordinator would be placed in each district who may be District Programme Officer of ICDS or person of similar rank. Teaching faculty from appropriate institutions may also be identified for the post. This person would co-ordinate the total water quality surveillance programme in the district and make liason with the State Administration. Co-ordinators would get a monthly honorarium for supervising the whole programme in the district.

It is envisaged that a **National Information & Communication Network** would be established to facilitate water quality monitoring through out the country and to create an **Information Database System.** The **Ministry of Rural Affairs & Employment, Government of India** may be the nodal ministry for the total programme.

Financial Feasibility and Sustainability :

For this programme **one field kit would be provided for every five villages** and therefore 1,12,000 field kits would be required. After completion of training activities and supply of field kits to the villages, the programme could be developed as a self-sustainable one. From the experiences of pilot studies it has been observed that a very nominal amount would be required from the community to sustain the programme (**10 paise / capita / month**).

The following is the budgetary estimate of the proposed model project (**village level water quality surveilance of 25 sources / 5,000 population / year**), taking into consideration the annuity of field kit, honorarium to grass-root workers and minor remedial expenses :

Number of water samples that can be tested with each refilling : 100 Nos.

Test frequency : Quarterly (4 times a year)

Therefore, **25 Nos. of sources can be monitored in a year with a single field kit, or with a single refill of reagents.**

Considering one source each for 200 population, approx. 5,000 population (25 X 200) could be served by one field kit.

Again considering 1 GRW for 1,000 population, 5 nomber of GRWs need to be allottedfor 5,000 population.

An additional honorarium of Rs.300/- would be given to each GRW per annum.

Capital Expenditure :

Cost of field kit :		7,500.00

Annual Recurring Expenditure :

1.	Honorarium to GRWs : 5 X Rs.300	1,500.00
2.	Refilling cost per field kit :	
	a) cost of chemical reagents :	1,200.00
	b) cost of bacteriological strips :	600.00
3.	Cost of disinfectants, minor remedial expenses, mobility, etc. (lumpsum) :	1,500.00
4.	Annuity :	750.00
	Total Annual Recurring Expenditure :	**5,500.00**

Therefore, the estimated contribution per capita per year works out to be (Rs.5,500.00 / 5,000) **only Re.1.11.**

The estimated contribution per capita per month would be approximately 10 (ten) paise only.

As per the budgetary estimate given below, the total investment required would be approx. Rs.110.168 crores. As per the 1991 census, the population of India is 84.4 crores. **Therefore, the per capita investment required would be around Rs.1.30. This is an one-time investment, as when the trainings are completed and the field kits are supplied / distributed, the project will become totally self-sustainable.** Thus the seemingly impossible task of regular water quality monitoring of all water sources throughout rural India alongwith remedial measures can be achieved if the Government authorities can invest a meager amount of Re.1.30 per capita and the beneficiaries contribute another Re.1.11 per capita per annum.

BUDGET :
Non-recurring expenditure :

	Item / Particulars	Amount
1.	Cost of field kit 1,15,000 @ Rs.7,500	86,25,00,000 **Funding : Central Govt.**
2.	Training for DLKTs, including TA/DA for the resource persons 50 trainings @ Rs.50,000	25,00,000 **Funding : Central Govt.**
3.	Training for BLKTs 1,100 trainings @ Rs.20,000	2,20,00,000 **Funding : State Govt.**
4.	Traing for GRWs 11,520 trainings @ Rs.12,000	13,82,40,000 **Funding : State Govt.**
		TOTAL : 102,52,40,000

Recurring expenditure for five years :

1.	Travel & transport	1,50,00,000 **Funding : State Govt.**
2.	Database reporting	1,00,00,000 **Funding : State Govt.**
3.	Stationeries, Report Preparation, Contingency	50,00,000 **Funding : State Govt.**
4.	Honorarium to district level Surveillance Co-ordinator 576 district X 5 years X 12 months @ Rs.1,500	4,64,40,000 **Funding : Central Govt.**
		TOTAL : 7,64,40,000

TOTAL BUDGET : 110,16,80,000

Share of expenditure : Central Govt.(84%): 92,14,40,000
State Govt.(16%) : 18,02,40,000

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CASE STUDY

on

Community Based Tara Handpump Maintenance Project

District : Bahraich, Uttar Pradesh

Kuckreja, M. Vanangana, UP.

Nestled at the foothills of the great Himalayas, about 80 kilometres from the district headquarters, is Sirsiya Block of District Bahraich which faced an acute drinking water problem. The government run water programme could not provide adequate facilities for the people living in some of the most remote and difficult areas of the district. The **Community Based Tara Handpump Maintenance Project** was therefore undertaken from **November 1992 to November 1994** to provide safe drinking water to the people of Sirsiya Block.

The PROJECT PARTNERS included

Uttar Pradesh Jal Nigam(UPJN),
UNICEF and
Akhil Bhartiya Gramudyog Sewa Sansthan (ABGSS).

While **UP Jal Nigam** was responsible for installation of handpumps, construction of platforms, supply of spare parts, technical training of caretakers and mechanics, the **NGO (ABGSS)** was involved in the process of community mobilization. **UNICEF** provided financial support, IEC material for training / orientation programmes, material support likeTara handpumps, spare parts, kits, tools, etc. and co-ordinated and monitored all the project activities from time to time.

The TARA HANDPUMP is a low-cost pump designed for use in areas with a shallow/medium depth water table ranging from 6 to 15 metres. Its simple design and ease of maintenance make it ideal for use in the Terai districts of Uttar Pradesh. The discharge from this pump is twice that of India Mark II handpumps. The Tara handpump is much lighter in weight and needs no priming. It lifts water on the buoyancy principle and the tubewell construction ensures that water from the second strata is made available to the users.

SIRSIYA BLOCK has 107 inhabited villages. **99 Tara handpumps were installed in 11 villages comprising of 38 hamlets** and one handpump was installed at the Jal Nigam store in Bhinga. Of these, there are 12 Tara handpumps where boring failed at the time of installation. Details of the number of handpumps installed in each hamlet of the 11 villages are given in **Annexure II**.

The VARIOUS ACTIVITIES undertaken in the project were as follows :

* One-day meeting with Gram Pradhans, Panchayat members, yuvak mangal dal members, teachers, ANMs and other influential people in each of the 11 villages to inform them about the community based handpump maintenance project.

* Orientation of teachers and students regarding safe water, personal hygiene and sanitation.

* A one-day village meeting in each of the 11 villages to inform people about the community based maintenance of Tara handpumps.

* Door to door contact to identify beneficiaries. During these personal contacts, a preliminary identification was made of WATSAN committee members.

* A village level meeting of these beneficiaries was held in each of the 11 villages. During this meeting, information was provided about community based maintenance of Tara handpumps, safe water, personal hygiene and sanitation and their relationship with health.

* WATSAN committee members were selected. This took some time.

* Sites were selected for the installation of Tara handpumps with the help of WATSAN committee members that were finally approved by experts from Jal Nigam.

* A caretaker was selected for each Tara handpump.

* The WATSAN committee members and caretakers were trained simultaneously.

* Tara handpumps were installed in all the 11 villages.

* Caretakers for India Mark II handpumps were also trained.

* 13 schools were whitewashed and messages regarding safe water, personal hygiene and sanitation were painted on their walls (once by hand and once by a professional painter).

* Participation fee for maintenance of Tara handpumps was collected.

* Repairs have been carried out on almost all the handpumps.

SALIENT FEATURES OF THE PROJECT

- Out of 100 Tara handpumps that were installed a total of 21 are out of order including 12 handpumps where the boring has failed.

- The working handpumps provide water all throughout the year.

- On an average, members of about 10 households in the immediate vicinity of the handpump use the water for drinking, cooking, bathing, washing clothes/vessels and for animals. Those handpumps that have been installed on the roadside or on the main village paths are used by passers-by too.

- In areas where Tara handpumps have been installed, people have stopped using water from unimproved sources viz. open wells.

- The main reason cited for using these handpumps was their proximity to the households which saves time and since pumping is easy water can be filled by all members of the family (young children, women and old people) whenever needed.

- In many cases, some parts of the handpumps like the handle retainer, washers,etc. have broken,but community members have used some locally available material to ensure that the handpump continues to function.

- Community members come forward to help the caretaker in undertaking repairs.

- The mechanic for the Tara handpumps in the Block (a functionary of the NGO) is well-known and people appreciated his efforts to repair the handpumps.

- During a meeting with the Block Development Officer of Sirsiya, he mentioned that people from other villages of the Block had expressed a keen interest and desire that Tara handpumps should be installed in their villages too.

- Simple problems with regard to the handpumps are sorted out and repaired within 3 to 4 days but where spare parts are needed, repairs take a long time (fortnight to a month).

- The main problem is obtaining spare parts. There is lack of understanding between the NGO and the government department as to who is responsible for providing the spare parts, whether they will be provided free of cost or whether the WATSAN committees can buy them. The Project Proposal states that U.P. Jal Nigam will arrange for spare parts and supply them to the village WATSAN committees on payment. The village committees have not been clearly informed about this aspect.

- Maintenance of the handpumps and platforms has not been successful. Users believe that the handpump is government property and should be maintained by it. Some believe that maintenance is the sole responsibility of the caretaker who they think is being paid a salary for this purpose.

- The caretakers say that maintenance is a problem as people just do not listen; they bathe and wash animals at the handpump sites and when told not to do so, there are conflicts (sometimes even physical harm is done) which has scared the female caretakers.

- At some sites, parts of the Tara handpumps have been stolen. Security and responsibility of maintenance of handpumps installed at public places like primary schools is absent.

- In some cases, sites were changed just before installation due to local pressures. It is at such sites that people are prevented from filling water or the new site is so far away/not easily accessible that people are continuing to use unimproved sources of water.

- Drainage of excess water emerged as a major problem in many handpumps. In some cases, drainage is a problem due to construction failure while in other cases people who had earlier agreed to allow water to flow out through their land have now refused to give permission. This has resulted in either water collection around the handpump or parts of the handpump have been removed/barricades have been erected to prevent usage.

- The training for caretakers has not empowered women sufficiently. Out of the few caretakers who could be contacted, only one (Vidyawati) confidently said that she could open

the handpump (See photogragh no. 5) and carry out small repairs. Some caretakers mentioned that they had forgotten what they had learnt during the training programme.

- WATSAN committees are inactive. Members do not know as to who the other members of the committee are. No meetings have been held. Those members who could be contacted did not know what these committees were meant for.

- People are not clear as to why money (participation fee) is being collected from users.

- No attention is being paid to personal hygiene among school children. Even though messages painted on the school walls during the project period still exist, teachers have been transferred. The new incumbents have no knowledge about the activities undertaken during the project.

- Follow-up activities were not undertaken by the government department and the NGO. Both became indifferent once the project duration was over. This is one major cause why the project could not become sustainable.

RECOMMENDATIONS FOR SUSTAINABILITY

Village drives can be repeated to mobilize and sustain community participation.

WATSAN committee members can be sensitized from time to time about water and its relationship to sanitation, health and the environment.

Re-orientation of WATSAN committee members and re-training of the caretakers is essential to maintain the continuum between motivation and participation.

The physical capability of women chosen as caretakers should be duly considered. Even though older women enjoy easy acceptability, younger ones will be more enthusiastic and willing to learn and will have the physical capacity to undertake repairs of handpumps.

Rural illiterate women are still a part of a male dominated society and need skills training that are economically viable to help them gain acceptability in their society. Thus, the training should not be the end; it should be followed up by utilization of the skills of these women.

The most crucial aspect of any empowerment process is to make spare parts available to trained women. Repairing of handpumps cannot be done by trained women in the absence of spare parts.If spare parts are provided, a caretaker can feel responsible for repairs. Delays caused by non-availability of spare parts will discourage the trained women.

Men should be encouraged to participate in the project . Besides, the support from influential people of the area will strengthen the project. Both will provide great encouragement to the continued participation of women.

Any project activity loses its momentum once it is over. To make a project activity self-sustaining, there is a need for systematic follow-up action. A good intervention can be to use the system created for another related project with a component of follow-up of the previous project. Immunization, Mother and Child Health, Literacy, etc. are isssues that can be linked with water and sanitation. In Bahraich, such projects need to be taken up at the earliest.

Where water is easily available through ponds, wells and especially private pumps, handpumps are not easily accepted by the community. Awareness should be created about safe water vis-a-vis health in such areas to build up support for community based maintainance projects.

A deliberate effort should be made by the government and NGO sectors involved in such time-bound projects to co-ordinate and co-operate in harmony with each other.

Discussions should be held between the community and experts on technical aspects of the Tara handpumps in order to minimize frequent breakdowns, reduce wear and tear of parts and simplify repairing procedures even further.

Selection of installation sites should be ideal if usage and maintenance has to be sustained. No amount of pressures should affect the selection of acceptable and technically feasible sites.

Details regarding villages visited for the study are given in the following pages (pp.4 to 10).

National Conference on O&M in

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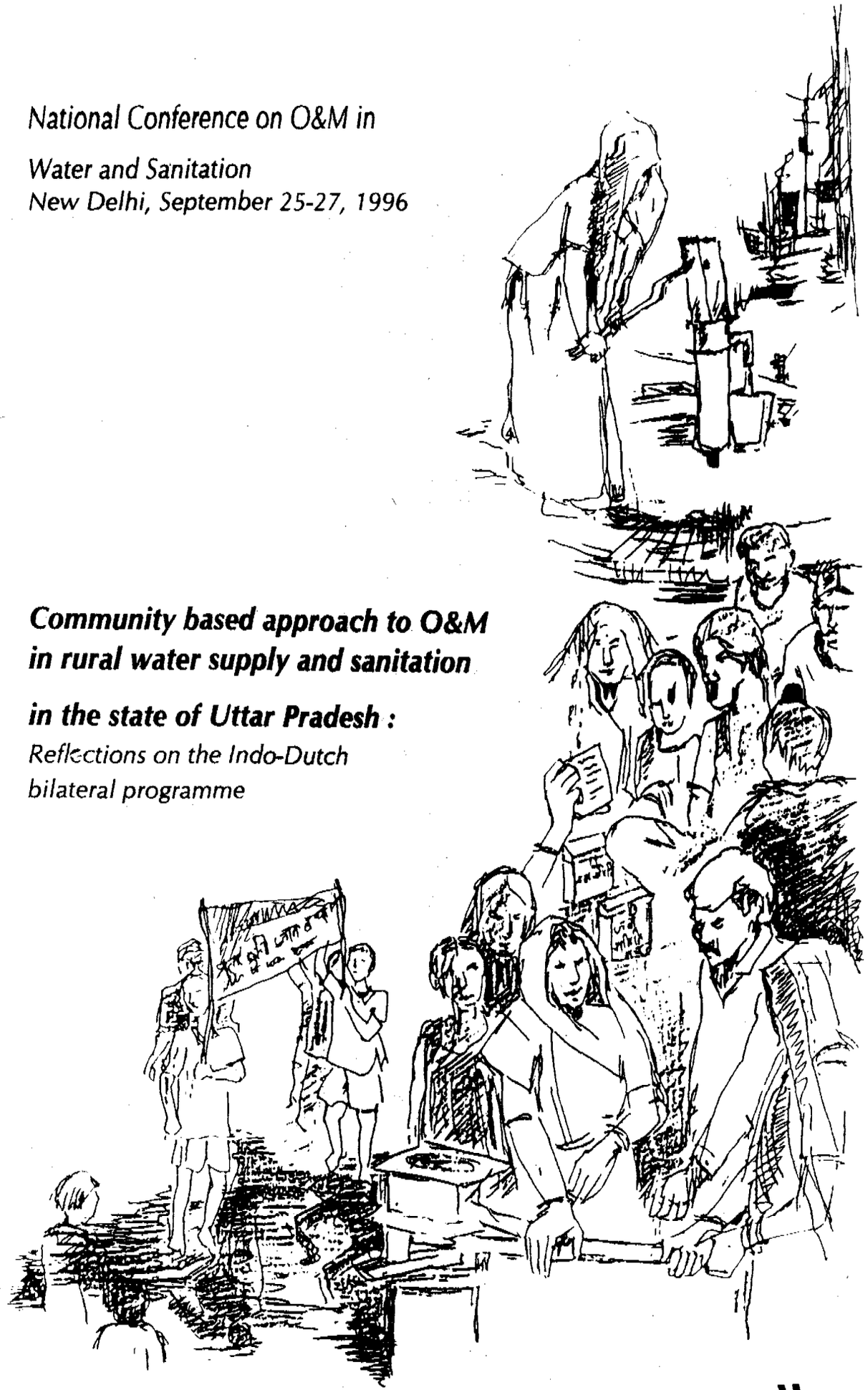
New Delhi, September 25-27, 1996



Community based approach to O&M in rural water supply and sanitation

in the state of Uttar Pradesh :

Reflections on the Indo-Dutch bilateral programme

PSU FOUNDATION

September 1996

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Community based approach to O&M in rural water supply and sanitation in the state of Uttar Pradesh : Reflections on the Indo-Dutch bilateral programme

The water supply programme was initiated in Uttar Pradesh in 1967 in response to severe drought conditions in the rural areas. Subsequently, the programme was expanded to include new areas and components when a survey undertaken in the year 1972 indicated that out of a total of 1,12,600 villages in the State 35,306 were problem villages in terms of water scarcity, or endemic presence of cholera and dracunculiasis or where water was unfit to drink because it contained excessive fluoride, chloride or iron substances. By 1980 however, safe drinking water could be supplied through various piped water supply schemes to only 7001 of these villages. Financial and other resource constraints were the main reason for the slow progress. In the subsequent, years because of a re-definition of problem villages as well as because of a greater degree of exactitude in the surveying techniques and partly by the political impetus that the programme had developed, the list of problem villages in the state continued to be alarmingly high at 78,050 as stated in the (draft) Eight Five Year Plan of the state.

At present out of a total of 2,74,641 habitations in the state, 1,74,129 are fully covered and 74,851 are partially covered with safe water sources. The safe water sources include 4,84,910 handpumps and approximately 6000 piped water supply schemes (the figures include the urban and rural areas).

The first programmes for construction of sanitary latrines on the other hand was only started in 1984-85 with the Department of Panchayati Raj (rural local government) being responsible for its implementation. During the Seventh Five Year Plan period (1985-90) 1,16,831 household sanitary latrines were constructed under various programmes like the UNICEF assisted sanitation programme and the Intensive District Coverage Schemes, Rural Landless Employment Guarantee Programme, National Rural Employment Programme and the Central Rural Sanitation Programme. An additional 2,08,925 latrines were constructed during 1990-1992 and motivation and creation of awareness was also brought within the scope of the programme. However, in spite of these efforts the problems remain to be daunting and only 2% of the rural population has been covered so far under various programmes.

Although the rural water supply and sanitation has been established as a priority sector for development where the investments, specifically in drinking water projects, in terms of technology and time have been considerable, the results have not been commensurate with the efforts. What seem to be the major gaps are the failure to establish the need for safe water and sanitary conditions in the context of health and enhanced quality of life, to instill a sense of responsibility amongst the users, and most of all the need to establish a viable system of operation and maintenance.

This paper attempts to delineate the evolution of alternative strategies, which have addressed the issues related to sustainable operations and maintenance of water supply, primarily in the handpump based projects, under the Indo-Dutch bilateral programme (IDC) in the State of Uttar Pradesh. The approach has been to increasingly involve the community at every stage and support the development of a strong and viable institutional framework with a self supporting system of resource generation.

Section I : O&M status[1]

Any assessment of the operation and maintenance situation in the rural water supply sector in Uttar Pradesh invariably focuses on issues related to appropriate institutional arrangements and adequate funds which in turn has implications on the adequate supply of water.

The maintenance of rural water supply in the state is primarily in the hands of a centralised agency, which incidently is also the agency which executes the works. Although, from time to time proposals have been drawn for the provision of separate maintenance divisions with separate funds at the district level, in reality a separate division exclusively for maintenance does not exist in most of the districts. ***Hence, maintenance, which is carried out as an additional task by the staff of the construction divisions, does not receive priority.***

The problems of an inadequate institutional arrangement, is compounded by insufficient fund flow for maintenance. The existing norms for fund flow is not only inadequate but is also rarely met ***thus widening the gap between investment and maintenance and hence leading to a policy whereby only the most essential maintenance is attended to. This in turn leads to restricted water availability and a breakdown approach rather than a preventive approach to operations and maintenance.***

1 Existing institutional arrangement

1.1 Prevailing systems

All rural water supply schemes and facilities in UP are maintained by the U.P. Jal Nigam (UPJN) with 3 different kinds of system prevailing across the State. The systems include (i) a 3-tier structure wherein the local community, mainly through the *pradhan*, can report the defects with UPJN's block level mechanics undertaking the minor repairs and the district level repair teams the major repairs; (ii) a 2-tier structure where the community plays a passive role with the local mechanics undertaking minor repairs and mobile team the major repairs; and (iii) a system where the repair work is undertaken by private mechanics .

1.2 An initial attempt at decentralised maintenance through the *Panchayati Raj* (1986)

Early in 1986 the GoUP took a decision to hand over the maintenance of handpumps to the *Panchayats*. Under the new situation, money was to be made available by the government for repair and maintenance of handpumps. This fund was to be kept at the nearest post office in the name of the *Gram Pradhan* (GP) and the *Gram Panchayat Adhikari* (GPA). The repair work was to be approved by the executive body of the panchayat and payment made accordingly. The provision of a mechanic and spares at the block level was also proposed. Detailed guidelines regarding the training of mechanics ,their scope of work, the role and function of *Panchayat Udyog*, each of which would look after one or two blocks, the process of reporting and monitoring of the repair works by GP and GPA as well as the method of maintaining accounts, cleanliness of platforms and surroundings were issued by the *Panchayati Raj* department. Emphasis was also laid on the importance of the *gaon sabha* bearing the

[1] This section is largely based on the information and comments from the reports of successive Review and Support Missions.

expenses on repair of platforms and drainage. Finally publicity to the arrangement was to be given by the *Panchayati Raj* department.

The transition period however, was prolonged and the programme could not be implemented in its entirety. In fact, during the period, in a large number of cases UPJN continued to carry out the repair works as the *panchayats* did not have the requisite back-up organisation for the O&M activities. ***In retrospect the success of the venture was doubtful at the initial stage itself because firstly, although the intention of the strategy was to bring the O&M responsibility closer to the villages at that time the Gram Panchayats were functionally inactive with most of the control still resting in the hands of the block administration and secondly, as stated earlier, they did not have the requisite skilled manpower. Under these circumstances a state of disrepair in the future was inevitable.*** A total of 20,410 handpumps had to be repaired by UPJN when they were handed back to them.

1.3 Reversion to an agency based system

In the mid 1987, therefore, the responsibility of maintenance of handpumps was reverted back to UPJN. Fresh guidelines were again issued in November 1987 for setting up of necessary norms and assigning various functions at different levels for the maintenance of IM II handpumps. The guidelines defined the strategy for a feedback system (self addressed postcards, complaints registers etc.), the role of the block level mechanics and his responsibility, (one semi-skilled mechanic provided with tool kit and bicycle to cover 50 villages or 200 handpumps),and the role and function of mobile units consisting of one Junior Engineer (JE), one mechanic, and one helper deployed at the tehesil level to monitor and support the block level mechanics. As per the guidelines a District Level Monitoring and Control Unit under a Assistant Engineer (AE) for over all supervision of the maintenance works was also to be set up at the district level. At that time embossing the project details, handpump specifications as well as the date of installation was also introduced. This system, with certain marginal modifications, continues in the State with Rs. 300 per handpump earmarked for maintenance. The actual amount received is however much less and has no relations to the maintenance requirement!

In June 1991 a draft plan for comprehensive maintenance was prepared, by a UPJN. The draft plan stated that any maintenance model has to take into consideration the total number of handpumps per block per district, average annual repair percentage which varies from district to district, percent of handpumps remaining out of order during two weeks or more, socio-economic factors of the community, data regarding status of handpumps including drains, strata chart, embossing, etc. However, the variations in the maintenance system existing across the state did not allow for the adoption of a uniform system. Therefore, 3 systems were suggested under the draft plan to be adopted in 3 geographical areas:

(a) relatively affluent western region could work with the mechanic-system whereby the village *panchayat* could be given the responsibility of maintenance;

(b) in the south-west with greater scarcity problem the 2-tier system could be introduced

(c) in the eastern and central regions with a larger number of handpumps and poorer population the 3-tier system was proposed .

The draft also pointed out that the proposed system will work only if all formats and responsibilities are well defined and supported by UPJN and the local authorities. The main

stumbling block in introducing the decentralised system as visualised above was the reluctance of the state government to transfer responsibility of the handpumps to the panchayats with full backup support.

2 Fund Flow

2.1 Growing gap between fund requirement and fund availability

Another critical structural problem which exists with the operation and maintenance of rural water supply schemes including handpumps in the State is that they are not financially self-sufficient even if repayment of loans and grants or depreciation is not taken into consideration. In 1986 the Central Government had recommended that 10% of the planned budget in the water and sanitation sector should be reserved for O&M. However, even this 10% allocation of the implementation budget is insufficient as it is fixed against the initial capital cost estimates without taking into consideration the growing rate of wear and tare as well as the impact of inflation.In case of handpumps the actual O&M costs including overheads are estimated at Rs. 300 to 350 per handpump per year against which normally Rs. 150 is made available by the State Government. A Dutch Review and Support Mission (RSM) (UP Mission 23 : November, 1989), noting these gaps, had pointed out that such a status inevitably lead to a situation of crisis management where only the most essential repairs were undertaken.

The actual O&M expenditure of JN is thus, largely based on the amount of funds that is made available by the State government rather than actual requirements . Forced by the relative paucity of funds UPJN has often to undertake the most essential maintenance with funds from the implementation budget. Thus, there has been a tendency to book O&M expenditure against construction budgets where both the activities are being carried out by the same division. Moreover, this situation may also lead to the cost of the supervisory staff as well as that of running and maintenance of vehicles being booked against budgets that do not differentiate between O&M and other types of costs. ***The, RSM had from time to time reiterated that O&M revenue and expenditure/cost therefore needs to be made more transparent for which information on actual O&M as well as revenues from water sales needs to be generated.***

2.2 Fixation of norms for maintenance cost

In October 1986 the first attempt to rationalise operation and maintenance activities in UP was made when a special departmental committee of the UPJN recommended norms for maintenance cost of rural water supply schemes. The Committee recommended 5% of the scheme cost for piped water supply, excluding energy charges and Rs. 400-500 per handpump per year. The norm for gravity flow schemes was fixed at 7.5% in hilly areas and at 8-9% of the scheme cost in desert areas. Further for handpump schemes UPJN issued instructions to its field staff on the organisational set up of the 3-tier system and about the financial bookkeeping system. The practice had been that the total budget calculated for O&M consisted of cumulative calculations submitted by zonal Chief Engineer. These however showed wide variations in methods used.

Then again in June 1991 a special committee to fix the norms for maintenance in rural areas was constituted by UPJN. In its report[2] the Committee observed that during the last decades huge capital investments had been made to create water supply assets and the ***major concern now was not to create additional assets but ensure fuller and better utilization of the existing assets.***

Fixed norms for the annual expenditure on maintenance were again established based on data collect d in the field. A standardised system for allocating O&M budget based on fixed cost per handpump or scheme per year was thus proposed. It was observed that at that time the overall range in repair of handpumps varied between 3% -117% per district amounting to an average of 35% for the whole State. Due to certain considerations the Committee had adjusted and adopted an overall annual repair percent of 25%. For piped water schemes model calculations were worked out for 4 types of piped schemes as there were wide variations in recorded expenditure due to lack of consistent field expenditure records, incorrect bookings, etc. The 4 schemes pertained to the plains with tube well source, plains with surface source, hills with gravity springs, and hills with pumping schemes. The committee also emphasised that the agency for repair and maintenance should not be changed again and again and there should be continuos efforts within the concerned agency to improve the maintenance system. These recommendation are yet to be implemented and meanwhile the fund situation for O&M continues to be dismal.

The reasons for O&M of water supply not receiving sufficient attention can hence be attributed to insufficient O&M funds being available to the field staff; lack of proper O&M schedules, directives and plans; focus on construction rather than maintenance; lack of appreciation by consumers who often vandalise the standposts. Further, the issue of revenue from water supply system will remain complicated as long as water tariffs are politically sensitive issue and no concerted efforts are made to realise the revenue.

It can therefore be concluded that over the years the O&M situation has not shown much improvement in terms of implementation in spite of the formulation of certain sound policies and guidelines, largely because of a lack of unanimity on the strategy and ceratin backup support from the government.

[2] Actual maintenance cost of rural water supply schemes in Uttar Pradesh: Recommendations of the committee constituted for working out norms for maintenance.

IDC PROJECTS IN UTTAR PRADESH : COVERAGE & STATUS (MARCH 1996)

LEGEND

- INTERNATIONAL BOUNDARY
- STATE BOUNDARY
- DISTRICT BOUNDARY

	Subproject IV *Piped water supply* Bhadohi, Varanasi, Allahabad	SP IV : Status of piped water supply — Status of private connections (Villages, Households, Pvt. connections)
	Subproject V *Rural sanitation* Rae Bareli, Varanasi	SP V : Rural Sanitation (March 1996) — Status of target and achievement (No. of units constructed, Thousands)
	Subproject VI *Handpump installation* Bahraich, Ballia, Basti, Gonda, Lakhimpur Kheri, Siddharthnagar	SP VI : Status of handpump installation (No. of handpumps, Thousands)
	Subproject VIII *Handpump installation* Aligarh, Badaun, Ballia, Kanpur Dehat, Moradabad, Unnao	SP VIII : Status of site selection & handpump installation

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Section II : Indo-Dutch cooperation in UP

3 Coverage of IDC

The IDC projects are being formulated and implemented since 1978 against this background with the overall objective being the provision of an adequate and improved and drinking water supply system in the rural areas of the state. Several sub-projects are being implemented simultaneously with each sub-project having a specific area of coverage and technological options, ranging from installation of deep bore handpumps and piped water supply facilities to household and school sanitation units. Until 1988, when the social component was first introduced in SP V and subsequently in SP VI, it was a purely technical programme. The programme now takes into account the need to build community based institutions and involve women in order to ensure sustainability of the facilities with information sharing, awareness generation and an expanded base for community participation being the key to success.

At present the various IDC projects (completed and ongoing) are together covering over 6000 villages spread across 19 districts of the State.

4 Milestones in community participation under the IDC

The IDC programme has been sensitive and flexible in responding to specific situations with constant attempts being made to resolve issues through strategic interventions. The interventions have been more in the nature of an approach and strategy which over the years has lead to the evolution of a comprehensive, community based programme encompassing such issues as environmental sanitation and hygiene, gender integration and sustainable structures .

In order to improve the situation from time to time a number of alternatives were thought of. These included, ***reducing O&M cost by enhancing the involvement of the consumers and thereby switching from break down to preventive maintenance, charging the consumer for the services rendered, etc. The setting up of a separate fund for operation and maintenance of completed IDC schemes, which could be replenished as per the amount sanctioned for maintenance by the government, was also advocated.*** This would not only enhance the accountability for O&M of the IDC schemes and increase the visibility of deficits, but would also improve thereof through specific measures aimed at reducing water wastage and increasing revenues (such as metering).

The following section is a chronological account of the major landmarks of the IDC with focus on the O&M strategies.

Successive IDC Review and Support Missions, mainly based on the community participation experience from the field, consistently, advocated O&M by local community. ***However, major obstacles for introducing a community based system where UPJN would only provide technical monitoring support were flaws in the overall monitoring and control system, absence of a decentralised spare parts storage, difference of opinion on the role of preventive caretakers and not having enough hands for curative maintenance while there was an excess of muster role staff who could not be engaged for effective maintenance. These obstacles made it imperative for the IDC programme to aim for a change in the behaviour pattern of***

the community with consumer orientation and community participation becoming a part of all ongoing and future projects. Gradually, with the setting up of the Programme Support Unit (PSU) the community's role in O&M was defined and alternatives were identified to involve them to a greater extent while assigning specific repair and maintenance tasks to them. This approach to a community based O&M under the IDC is embedded in the strategic evolution of the programme itself.

4.1 Choice of technology

Indo-Dutch Co-operation (IDC) in the rural water supply and sanitation programme in Uttar Pradesh dates back to June 1978 when UP Jal Nigam submitted a Project Profile comprising of 22 piped water supply schemes in the districts of Rai Bareli, Allahabad and Varanasi and on the basis of which the side letter was exchanged in November 1978. The first project under the IDC programme, Sub-project I, was thus initiated to provide piped water supply to a design population of 912,100 (Design year 2011) in 724 villages spread across three districts.The sub-project was designed to be a purely technical project as at that point of time sound and effective technical facilities alone were considered to be sufficient to solve the existing water problems in the rural areas.

Since then the programme has expanded in terms of geographical and population coverage to include 8417 villages spread across 19 districts of the State and in terms of *approach from a technical project to a community based one where the gradual focus has been on improving the quality of service vis-a-vis improvements in the O&M of systems.* Further, in response to both the policy of the GoI as well as the assessment of the situation by subsequent Dutch missions over a period of time handpump based projects came to be favoured, except in those areas where installation of handpumps were not feasible or where the quality of water was not suitable from a chemical point of view. Thus, the piped water supply project, SP I, was followed by only one another piped water project, SP IV (December 1987) and several handpump based projects - SP III (January 1986) SP VI (mid 1990) and SP VIII (October 1994).

4.2 Inclusion of environmental sanitation

A significant addition to the programme was made in the year 1988 when an action oriented project - SP V - focusing on the provision of sanitary latrines and environmental sanitation was brought within its scope.The formulation of SP V was the result of the realisation that piped water supplies and handpumps aggravated the already existing problems of drainage and sanitation in the villages. The high population densities, the absence of sanitation facilities and often poor drainage conditions of the alluvial soil of the villages where the IDC was first initiated, emphasised the urgency of the matter.

After protracted debate on issues related to the components and implementation structure the project acquired a final shape to include the construction of 14,101 household sanitary latrines and 48 School sanitary latrines as well as tank type standpost together with hygiene education with emphasise on training and community involvement. *Hygiene promotion was given priority and the emphasise was on bringing forth a behavioural change rather than a mere transfer of knowledge. Women were central to the entire process of mobilisation and awareness generation.* The project was to saturate a total of 46 villages spread across the districts of Varanasi and Rae Bareli. An integration of the construction activities and the social inputs was to be effected through a collaboration between UP JN (*vis-a-vis* its specially set up Rural Sanitation Division and PSU Foundation.)

4.3 Strategic guidelines for the optimisation of operation and maintenance in piped water supply

From the inception of the first IDC sub-project i.e. SP I, a definite strategy for the operation and maintenance of the schemes was part of every project proposal. At the stage of project preparation itself emphasise was placed on selecting and appraising certain parameters of the schemes like the design period, population growth rate, water consumption pattern willingness and ability to pay for services etc., in terms of their financial and economic viability as well as their effect on the operation and maintenance.

4.3.1 Separate structure and funds for O&M

Further, in line with the IDC policy, separate maintenance units were to be set up by UP Jal Nigam in all those IDC project districts which did not have such an arrangement at the time when the programme was initiated. ***The programme laid great emphasis on not only the quality of water being supplied but also its quantity and frequency and in subsequent projects took care to provide for water testing laboratories, generator sets and other one- time capital investments required for effective operation and maintenance.*** The funding agency and its Review and Support Mission assumed that the State government would establish a system of procuring, on a regular basis, funds for the operation and maintenance of rural water supply schemes, in order to reimburse the UPJN for any losses incurred in operating and maintaining such schemes at the initial stages of the project. ***Eventually, however the schemes were expected to become self - sustaining.***

4.3.2 Adequate supply hours

Further, the IDC programme placed emphasis on the issue of supply hours and the monitoring of the functioning of the works in total. The IDC schemes have been designed -on the basis of a 16 hours pumping per tube well and continuous hours of supply throughout the day. Again and again consecutive RSMs had observed that in practice this was not so as the supply hour were deliberately restricted partly to reduce the cost of operations and partly to reduce wastage at public standpost. Added to this was the fact that power supply through regular rural feeder lines was restricted to no more than a few insufficient hours a day. The transmission and distribution system therefore remained pressureless for a major part of the day leading to back syphoning of potentially contaminated shallow ground water or surface run off so that the distributed water is no longer bacteriologically safe.

The variation in the actual supply hours from that used in the design leads to a reduction in the available capacity because actual peak loads are higher than those taken into account at the time of designing the scheme. In such cases the technical life of the scheme are at stake.Moreover, it also jeopardises the supply to consumers in the sense that public standposts may not be able to cope with the demand in the limited time that the water is supplied. Experience in the field indicate that even 10-12 hours of supply per day would probably be acceptable to the community provided that the hours are fixed and the supply regular. ***The issue of involving the community, through the Panchayats and community based organisations (cbo), in the water project and the need to respond to the felt needs of the users while optimising the operations and maintenance of facilities again seemed to be the ultimate answer for sustainibility.***

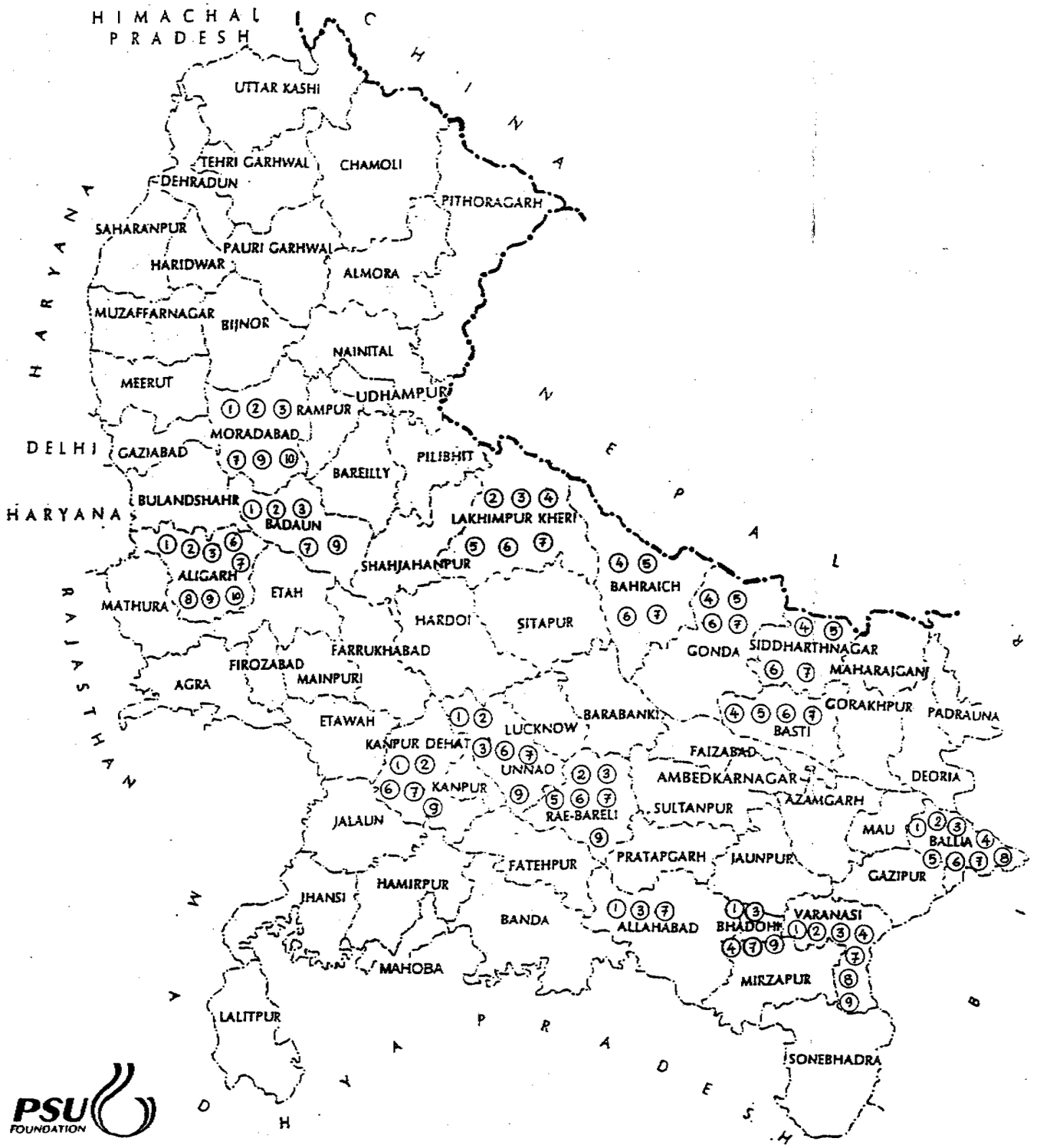
4.4 Integrating community participation and gender

At around the time that SP V was being conceptualised it was realised that the programme objectives of supply of potable water, sanitary facilities and improved health situation in the villages could not be achieved by the construction of facilities alone. Successive Review and Support Missions pointed out that to keep a water supply system functioning satisfactorily several issues needed to be considered. ***This included site hygiene and site management, regular preventive maintenance, quick reporting of breakdowns and finally quick repairs.*** It was thus imperative to involve the community in order to ensure the optimum use and reliable functioning of the water sources as well as encourage better hygiene practices. The then proposed sanitation programme could also be only possible with the consensus and the active participation of the community. Further, the participation of women, greatly concerned with safe and reliable water supply as well as sanitation should specially be strengthened.

Therefore, the objectives of the rural water supply programme in the state was expanded to include guaranteed long-term and reliable functioning of facilities in such a way that it satisfies the socio-economic and cultural patterns of the community; that all community members have asses to clean water throughout the whole year and use this in a hygienic way; and that health risks that are related to the use or non-use of clean water are eliminated. ***The concept of community participation, hygiene education and institution building thus emerged and gradually acquired a definite shape with the formulation of SP V and the consequent creation of the Programme Support Unit in March 1988.***

With community participation becoming central to the programme, efforts were made to identify the areas and process of integrating the social component with the technical one. The involvement of the community, was initially conceptualised by PSU Foundation (then known as the PSU) through critical pilot projects focusing on community based maintenance, in selected villages in Allahabad and Rae Bareli (including the villageof Tanghan). The experience in the pilot projects were the basis of the formulation of definite goals and strategies in SP V and SP VI which in turn was the model for planing of the present community based strategy in SP VIII and the ongoing efforts to optimise the system of operation and maintenance in SP IV.

IDC PROJECTS IN UTTAR PRADESH : EMERGING TRENDS



LEGEND

- INTERNATIONAL BOUNDARY
- STATE BOUNDARY
- DISTRICT BOUNDARY

①	Resource/situation analysis
②	Site selection
③	Review and corrective intervention
④	Community based maintenance
⑤	Training and capacity building
⑥	Cost sharing and institution development
⑦	Interfacing with grassroot and district administration
⑧	Hygiene and environmental promotion
⑨	Reaching out : Participatory communication
⑩	Information sharing and management

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Section III : Community based O&M initiatives under the IDC

Alternatives for sustainability, which emerged in the course of the IDC programme all lead towards the increasing participation of the community and an integration of efforts at the grassroots level. Thus, sustainable institutions and structures became the focus of activities.

5 Evolution of an institutional arrangement

5.1 Conceptual evolution of Pani Panchayats at Tangahan (1989)

A pilot project at Tanghan initiated in 1989, was the first community based attempt under the IDC where the focus was on community management of the water points and improvements in environmental sanitation. This first tentatively structured attempt by the two implementing agencies lead to the formation of the village level water committees and the evolution of the *Pani Panchayat*, consisting of a selected group of women representatives from among the users of facilities in the village. These rudimentary structures were quickly mobilised into taking care of not only the village drains and pavements but also into spreading some amount of hygiene awareness among the community. However, it was observed that the non-involvement of the community at the time of planing and implementation of the project and the failure to asses their felt needs diluted attempts at mobilising their participation at a latter stage of operation and maintenance. It was also noted that interventions planned in isolation lead to a peculiar situation where the community lacked confidence in the agency and the latter in turn was sceptical about the potential for cooperation from the former.

5.2 Creating a community resource base of caretakers and mechanics at Allahabad (1989)

At about the same time, at the end of 1989, another pilot project was initiated in 3 villages (Mandri, Kadirpur and Bhagwatpur) in the block of Chail in district Allahabad. The project, with the goal of ensuring maintenance of the handpumps through participation of the community had the specific objective of bridging the gap between the technical implementing agency and the community. This was to be achieved through improved rapport as well as improvements in the channel of communication to dispel the existing state of wariness and doubt between the implementing agency and the community. Local level participatory structures with focus on the participation of women were to be developed for facilitating the process.

5.2.1 The structured strategy...

The strategy undertaken by PSU Foundation and UP Jal Nigam for reaching the goal therefore included:

(a) creation of a village resource inventory;

(b) monitoring the performance status of the handpumps installed and its surroundings and the monitoring of the quantity and quality of water discharge;

(c) involving the community during the process of corrective technical interventions undertaken;

(d) constituting participatory structures with well defined functions and ensuring at least equal participation of women in order to facilitate the process of site selection, monitoring of the quality as well as the quantity of water, for ensuring early repairs of handpumps, and maintaining cleanliness around handpumps;

(e) formulating guidelines for selection of appropriate caretakers and thereafter selecting and training them to improve the system of reporting and accountability (selection of women caretakers was emphasised);

(f) making special efforts to ensure effective women's participation in the programme by initiating health and community participation campaign through group meetings and other innovative communication techniques;

(g) supporting the water committees to generate funds from the panchayats for social forestry around the handpumps, for constructing bathing and washing platforms from uniform contribution from the beneficiaries and for maintaining cleanliness and hygienic conditions around the handpump sites.

5.2.2 *... and the transition to the concept of Jal Samitis*

Thus, the initial efforts to mobilise the local community lead to the formation of water point based committees, now termed as *Jal Samitis* and identification of a caretaker for each handpump. Subsequently, the caretakers were trained and during the process of training and orientation of the caretakers a local mechanic was identified to undertake major repairs. The mechanic being local was easily accepted by the community. As UPJN was also ready to experiment with this structure the approach was extended to the rest of the block and a total of 40 mechanics, including 9 women, were eventually trained. Eventually most of the mechanics, including 5 of the women were assigned repair jobs on a contract basis. The mode of payment was determined on the basis of the nature of repair as well as the mandays spent. Information regarding the repairs to be undertaken was kept at the community centre and payments were made after the *Jal Samiti* had certified the work done. JN provided tool kits on loan to groups of mechanics who were allotted a cluster of village convinient to their place of location.

The experiment in itself was successful and had resulted in the evolution of possible alternative community based structure and institutional arrangements which could ensure sustainibility to the programme. However, the system could not be sustained much after the withdraw of the direct project inputs as UPJN did not get the required support to institutionalise the process.

5.3 Concretisation of the community based structure for O&M of handpumps

Thus, when SP VI was re-formulated in the districts of Gonda, Bahraich, Basti, Siddharthnagar, Lakhimpur and Ballia, to include a "social paragraph", the formation of handpump and village based Jal Samitis was a critical component. A policy document defining the concept, structure and functions of the Jal Samiti was prepared by PSU towards the end of 1989 .

The document stated that *Jal Samiti* were to play a supportive role to the existing *Gram Panchayats*. It was in fact emphasised that they were in no way to assume any conflicting functions with the *Gram Panchayats* and in order to avoid any misconceptions they were

renamed as *Jal Samitis* instead of *Pani Panchayats*. The *Jal Samiti* were to provide voluntary services to the community whereas their recommendations to the GP were advisory in nature. ***Although, unlike the Gram Panchayats, they held no legal status, UP JN had accorded them the recognition of the main facilitative structure at the grassroots level and the GoUP had accepted the concept in principle.***

5.3.1 Structure of Jal Samitis

Initially, the *Jal Samiti* were proposed to be 2- tired with village and hamlet/water point based committees to be formed in every project village. The village based committees were to be formed at a meeting of the *Gram Sabha* and in the presence of the *Panchayat* and the *Pradhan*. The strength of these committees were to be not less than that of the *Gram Panchayat* and the *Gram Pradhan* or a nominated member of the *Jal Samiti* was to function as the link person. Every hamlet and social group was to be duly represented. ***The hamlet/water point level committees were to be formed after the selection of sites and the installation of the handpumps and their strengths was to be determined by the village committee in consultation with the gram pradhan.*** The members were to be nominated by the potential users. The handpump/ward level committee in turn was to nominate a caretaker for each handpump who would be responsible for organising meetings and other water point level activities. UPJN was to train the caretakers in aspects of preventive maintenance and on the establishment of an effective feed back system.***The financial status of the water committees were to be based on user contributions and the right to raise such contributions was vested in the Jal Samiti. The money collected was to be deposited in a saving bank account either in the Bank or Post office.***

5.3.2 Handpump level Jal Samitis

However, in the course of the Pilot Project at Allahabad it was realised that the *Jal Samitis* need to be further decentralised to the water point level for very pragmatic reasons related to the existence of social segregation in the villages as well as peoples interest in upkeep of a water point being limited to the one nearest to their dwelling place. SP VI thus, saw the formation of handpump level water committees together with the installation of ***handpumps.Iinitially the formation of Jal Samiti were necessarily limited because the social component itself was introduced into the project well after 60% of the handpumps had been installed.*** This had several implications:

(a) Firstly the priority was to complete the physical targets and undertake necessary corrective interventions on those handpumps which had been installed prior to the inclusion of the social component. At this stage therefore, the involvement of the community took the form of "site selection" rather than "site management". Further, as per the strategy adopted at that point of time, the *Jal Samiti* were to be formed after the installation of the handpumps thus relegating the institution building process to the second place.

(b) Secondly, the isolated and scattered distribution of the village across administrative blocks required that each village be taken up as an individual case making it difficult to adopt a comprehensive approach at least at the level of the block .

(c) Moreover, the status of the rural local bodies - the *Panchayats* - at that time was not conducive to the institutionalisation of the process.

In spite of these inherent drawbacks however, *Jal Samiti* were being formed all over the project villages, especially in those areas where the installation of handpumps were taking place. *The act of involvement of the community in the process of site selection as well as the efforts that were made by UPJN to rectify the technical faults in those handpumps already installed, facilitated the formation of these Samitis. In fact some remarkable cases of improvement in maintenance were witnessed in several of the project villages.*

Consequently, after the completion of the installation process the Sub-project was extended to incorporate a phase wherein the objective was to establish a comprehensive system of decentralised community based maintenance and therein identify the elements of sustainibility.

5.4 Creation of a trained resource base

5.4.1 Training strategy...

The initial proposal for "Training for Decentralised Maintenance Approach" approved in early 1993 had visualised the establishment of a system of decentralised maintenance wherein caretakers identified from the community for each handpump would be trained to be responsible for its upkeep and preventive maintenance. The caretakers duties included the checking and monitoring of the above ground status of the handpumps and its surroundings and promptly reporting the defects to the concerned JE. *This, while making minimum preventive maintenance resource available locally, would take a substantial amount of burden off UPJN.* The training was to be implemented on a pilot basis in some of the selected blocks of the six SP VI districts with UPJN and PSU being jointly responsible for the training as well as the operationalisation of the system.

Thus, it was visualised that by the end of the training period a skilled resource base of caretakers and 100 Cluster Level Mechanics (CLMs) were to be prepared to look after around 5000 handpumps. The project also had the defined objective of ensuring maximum participation of women.

(a) Two-pronged approach: Caretakers and Cluster Level Mechanics (CLMs)

Subsequently however, another dimension was added to the programme when the training of 100 Cluster Level Mechanics (CLMs) was also incorporated with the logic that in a system where lack of funds and skilled resources had severely effected the provision of preventive as well as breakdown maintenance, *a two pronged approach whereby handpump based caretakers would look after the above ground maintenance and skilled CLMs the breakdown maintenance would be more effective and was also likely to sustain. It was contented, that when finally the community themselves would also pay for the maintenance work undertaken, the process of establishing a community owned, managed and maintained water supply system would be completed.* However, due to the nature of the project(pilot basis) as well as budgetary constraints, the second level of training was restricted to only one block in each of the six districts.

(b) Identification and training of caretakers with a gender perspective

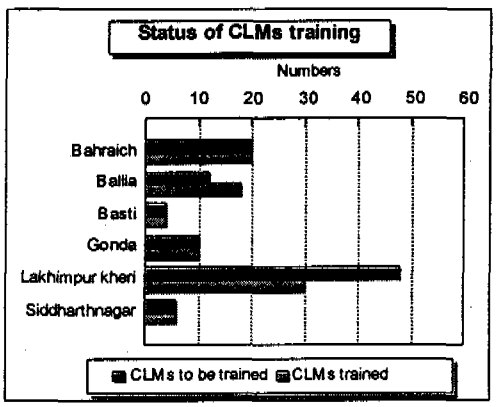
The project was finally started in mid 1994, and is presently being implemented in distinct phases. The first phase focused on the training and establishment of caretakers for every handpump. Under this phase the existing *Jal Samiti* were consolidated and new ones formed

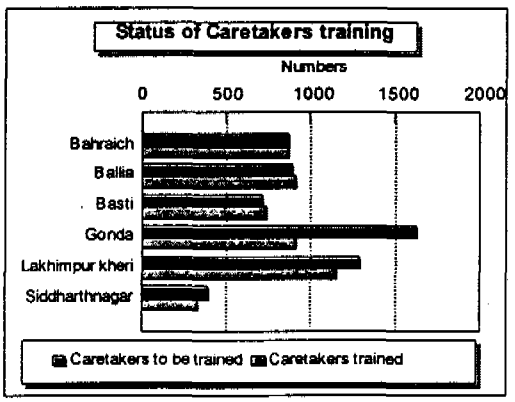
wherever necessary. Further, the handpumps installed were reviewed with the objective of rectifying all the major and minor defects as well as upgrading the drainage facilities and the disposal of waste water. Finally, caretakers were selected on the basis of specific criteria from handpump based *Jal Samiti* with more than 90% of a total of 4907 caretakers being women. Thereafter, a series of two-day training workshops were organised for groups of caretakers wherein the focus was on issues like safe water, hygiene awareness, environmental sanitation, duties and responsibilities of the community, the *Jal Samitis* and the caretakers as well as demonstrative lessons on preventive maintenance. The sessions were participatory and practical. A total of 4907 Caretakers have been trained upto the month of August 1996.

(c) Training of CLMs

The caretakers training was followed by the next phase wherein initially a team of two mechanics for each convenient cluster of villages was identified along with the initiation of dialogues with the community for evolving a system of community based fund generation and management for maintenance. Thereafter, the identified mechanics, a total of 88 spread across six blocks and covering handpumps, underwent 4 weeks of rigorous hands-on training undertaking actual repairs along with the block mechanics of UP JN.

The training have been completed in all the districts and the entire system has been evolved in carefully planned stages with the emphasise being on both training and motivating the community to generate its own funds as well as manage it to meet the expenses of maintenance.





5.4.2 ... and operationalisation of the system

During the present stage of operationalising the system under the close monitoring of UP JN and PSUF, certain aspects which are being addressed are :

(a) Cost sharing and fund management

Cost sharing is an important attribute of operation and maintenance system in the Indo-Dutch water and sanitation projects. In the handpump projects the cost of maintenance of handpumps is borne by the community. This has got four major implications as far as the sustainability of the water and sanitation facilities are concerned:

(I) Fund is mobilised from the community and managed by the *Panchayats*. This has rendered transparency in fund management which was difficult in agency-based maintenance system.

(ii) Community based management of water facilities has increased the efficiency of the community in terms of developing technical skill for maintenance within the community. This has increased the employment potential within the community.

(iii) Community based maintenance has reduced the responsibility of the UP Jal Nigam as a result of which total cost of maintenance is reduced owing to the reduction in the monthly establishment cost used to be incurred by the UPJN.

(iv) Labour for any repair work is now mobilised from the community and hence, total cost of maintenance has been reduced.

Therefore, the process of cost sharing and fund management under the community based operation and maintenance system has made the system very cost effective as compared to the agency based maintenance system.

The amount of fund to be collected from each of the user is decided at meetings by the community once they are appraised of the amount of money required on an average per handpump, per year. The money is kept in the nearest post office or bank in the joint account of the caretaker and the *Gram Pradhan* in the case of the blocks being covered under preventive maintenance. In the blocks where CLMs have also been trained the pattern at present varies with Districts of Gonda, Basti, Siddharthnagar and Lakhimpur opening accounts in the name of caretakers and *Gram Pradhans*, Ballia in the name of *Gram Pradhan* and *Panchayat Raj Adhikari* and Bahraich in the name of the CLMs and *Gram Pradhan*. Account of the funds collected and expenditure incurred is maintained by each *Jal Samiti* and the account holder. Each district has developed its own formats and systems with some variations.

The process of collection of funds as well as decision making on the expenditures to be incurred needs to be further streamlined so as to ensure *effective transparency and accountability at all levels*. Further, efforts also need to be made to ensure that all members of the community pay the user charges. The strategy being adopted is to change the concept and process of generating funds at the handpump level to that at the ward level so that the funds thus collected can then also be utilised for other village sanitation related activities. As on June, 1996 over Rs. 2 lakhs was generated from the community in the SP VI districts.

(b) Corrective intervention and information flow

The rates of payment are decided by UPJN and PSUF in consultation with the community and payments are made after the community and the GP have verified that the corrective interventions have been made. Each CLM is issued with an identity card entitling him to undertake repairs in the area allotted to him. The process of reporting of handpump defects and taking the necessary corrective interventions need to be further streamlined. The process being effected is that of the community reporting to the concerned CLM who in turn will directly undertake the repair work . As the rates for the repair has already been fixed in all the districts, the community and the account holder is only expected to verify the work done and thereafter make the payment to the CLM from the ***amount collected and deposited in the Bank or Post Office.***

A decision has been taken (jointly by UPJN and PSUF) to the effect that the spares will continue to be supplied by UP JN until such a time that the system has proved effective and some arrangement has been made for the open-market purchase of standard spares at the local level. Spares are thus issued by the UP JN and detailed inventory is maintained by both

UPJN and the CLMs. However, it is imperative for the success of the programme that the spares are made readily available. As a number of villages are at a great distance from the divisional headquarter of UP JN, from where the spares are issued efforts are being made to identify an ***alternative storage and issuing structure at the block/ tehsil level*** through the formation of an appropriate nodal committee.

(c) Transfer from an agency based to a community based structure: institutionalisation of the system

Finally, the most critical intervention that is being carried on at the ***moment is that of institutionalising the structure and process vis-a-vis the Panchayat Raj system so that any ad hocism in the system can be gradually eliminated and it could be uniformly implemented in the entire state.*** A systematic process of issuing the necessary directives through the channel of the District Magistrate (DM) - Block Development Officer (BDO) and the District *Panchayati Raj* Officer (DPRO) - Block *Pramukhs* - *Gram Pradhans* is being followed. Further, information regarding the system is constantly shared with the community and the district and block administration as well as the pradhans and crucial decisions are also taken after joint consultation with them. To facilitate the process of disseminating information about the structure to the village level a series of ward level meetings are being organised through the office of the BDO. This, will also facilitate in streamlining the process of transfer of activities from an agency to the community.

The project is at a critical juncture at present wherein the process of consolidating the activities through identification of gaps and establishment of a comprehensive and self sustaining system is underway.

5.5 O&M : Integration within the framework of the Panchayati Raj (SP VIII)

Towards the end of 1994 a new sub-project - SP VIII - was initiated in the districts of Ballia, Kanpur (Dehat), Unnao, Aligarh, Badaun and Moradabad. A handpump based project, the SP had several unique features, the most significant being that it was the first instance where UPJN and PSUF had been involved right from the time of project planing. ***Hence, the process of community participation could be initiated from the inception of the project, unlike the earlier SP where it was introduced at a much later stage.***

(a) Framework document on community based use and maintenance modalities

During the preparatory phase UPJN and PSUF prepared a "Framework Document for Implementation, Use and Maintenance and Training with Community Participation" detailing the modalities for implementation and underlining the importance and process of maintenance. the Framework document also indicated that one of the ultimate objective of the SP was to transfer the O&M of handpumps to the community. As such the document also spelt out the modalities for the same.

(b) Provisions under the 73 rd Amendment to the Constitution

Further, the passing of the 73rd. Amendment to the Constitution in 1994 and the long awaited Panchayat elections with 33% reservation for women, in 1995 provided a conducive environment for the initiation of a community based system in SP VIII districts. Thus, a major change in the approach was effected whereby corresponding to the physical implementation (site selection) institution building at the community level was attempted within the

framework of the *Panchayati Raj*. The earlier experience in community based maintenance were thus sought to be consolidated in SP VIII.

As by then the important need to ensure the sustainibility of water committees was very apparent, therefore the provisions and viability of the long established system of local bodies - the *Panchayati Raj* - within the framework of the 73rd Amendment ment and the concept of community managed water systems were examined. Specific clauses were identified to support the formation of sub-committees, their composition and functions, the oraganistaion of meetings, the levy of taxes, the miantenece of funds, the auditing of accounts and the maintenance of hygiene and cleanliness around handpumps. (The sections of the Act referred to were Section112 (1) (A) and Rules 243,244 and 245 for formulation of by-laws, Section 29 (6) for formation of sub-committees, Section 37 (h) for levying of water charges and section 40 for auditing of accounts). Simultaneously a process was intiated where major responsibilities of the *Jal Samiti* were re-examined *vis-a vis* the the functions to be performed and the powers that needed to be delegated so that they could discharge their regulatory functions within the provisions of the *Panchayati Raj* Act.

(c) Ward level Jal Samitis

The *Jal Samitis* are thus now formed at the ward level to facilitate their incorporation into the structure of the *Gram Panchayat* with the *Gram Pradhan* being ultimately responsible for their functional and financial operations. Significantly the possibilities of the samitis sustained involvement in operation and maintenance is also enhanced as they are now being formed prior to the process of site selection and hence are vigorously involved in identifying the sites, monitoring the process of implementation (basic technical information related to the selection of sites, depth of bore, materials used are also being shared with the community) and mobilising resources for immediate on-site construction of structures like bathing and washing platforms as well as for seed money for future maintenance. As in the case of SP VI the amount to be collected per household was also decided by the community once the volume of maintenance requirements was made known. Under this structure within a short span of time (within six months of starting the implementation phase) a total of Rs. 4 lakhs was collected from the districts under SP VIII. The funds are thus collected at the Ward level and deposited in a bank account at the village level. The account is jointly operated by the *Pradhan* and a member of the Committee as required under the *Panchayat Raj* Act.

Thus the major difference in the approach to setting up an institutional structure as ell as generating funds, lies in the existing constitution of committees as well as the level at which the funds are being generated. In SP VIII handpump level jal samitis were formed whereas in SP VIII ward level Samitis are being formed. Further, fund generation at the ward level for the village water and sanitation related activities has been initiated from the start whereas in SP VI this was done at a later stage and at present funds are generated in the form of handpump based user funds. The significant inputs of the approach under SP VIII can thus be summed up as institutionalisation of a sustainable structure for O&M at the local level and resource generation under the a "user pays" concept through an intense process of information sharing and consultations with all concerned parties. The concept of subsidy and the burden of maintenance on UPJN is hence being gradually reduced. Over Rs. 3 lakhs (as on August, 1996) has been generated from these villages taken up in the initial phase of SP VIII.

5.6 New initiatives in piped water supply schemes

Although piped water supply schemes was the first initiative under the IDC, their execution and more so their O&M has been a greater cause for concern than the handpump based projects.The constraints have been identified by various review and appraisal Missions as certain ***inherent anomalies in the technical designs, a persistant lack of O&M resources and an inadequate support structure of the implementing agency besides a lack of awareness and motivation on the part of the community.*** So much so that a decesion was taken by the Government of Netherlands to reduce future investments in new piped water supply schemes and as a policy only support the installtion of handpumps. To improve the situation the social component was introduced into the ongoing SP IV in mid 1992.

As th O&M situation continued to be grave inspite of the introduction of community participation, in December 1995, the UPJN along with the PSUF initiated a pilot study to establish a community based maintenance system. The salient objectives of the pilot phase is to initially undertake corrective measures in order to ensure the technical viability of the schemes, to generate resources by regularising illegal connections and motivating the community to opt for private connections, and to develop institutional support at the village and scheme level.

The project so far has yielded encouraging results in terms of its financial viability and positive response of the community. Voluntary community labour was mobilised for leakage repair, thereby not only reducing the cost of repairs but also ensuring sustained participation in the O&M process. This was further strengthened by establishing a community based maintenance system *vis-a vis* scheme level committee in two of the schemes (Awajapur and Jansa in the district of Varanasi) on a test basis. These committees comprise of village pradhans, consumers and some respected local resource persons. However, as yet these are informal groups and need to be structured within the framework of the panchayat system.

Further, in order to ensure recovery of the O&M costs special revenue collection drives were emphasised in the process of which a total of Rs. 2,60,000 was collected within a period of 3 months. The camps focused on the legalisation of existing connections and the promotion of new ones.

5.7 Use and maintenance of sanitation facilities

Although the IDC programme largely consists of several water supply projects, its activities in the field of sanitation is of conceptually critical importance. As has been stated earlier in the document the sanitation component was introduced into the programme to fill a felt gap in those areas where water supply was being provided under the IDC programme. The integration of the community participation and the technical component was initially effected here.

Regular monitoring of the project and some mid- project evaluation by independent outside agencies brings into focus the high rate of use and maintenance of the household latrines constructed under the project. However, the approach to mobilisation as well as the maintenance of facilities differed from that under the water programme as the provision of facilities was at the household level unlike that of the handpumps.

The project has acquired a distinct identity, with a significantly high rate of acceptance of the concept as well as the facility, manifested in the high rate of use and maintenance across the

community. The factors which contributed to this success are :

(a) **Acceptability of design**

The design features include both below the plinth construction and the superstructure. The superstructure, besides being complete with door and roof, has been modelled on the basis of feed back from the community generated during the preparatory phase of the project when a number of demonstration units were built at vantage points. The designs were evaluated on the basis of their functionality, adaptability and cost effectiveness with their acceptability being reflected in the regular use and maintenance.

(b) **Sharing of cost and responsibilities**

Individual ownership of the facility and the contribution made by the owner towards the cost of construction have further consolidated the use and maintenance pattern. The amount of subsidy has been determined on the basis of the economic category of the household. Moreover, the household is also involved in selecting the site for selection, carting and guarding the material as well as the monitoring of the construction activity. This ensures a sense of ownership and consequent maintenance. The mobilisation efforts, both prior to the construction as well as thereafter, also ensure subsequent upgradation of the units at the owners cost.

(c) **Intense mobilisation and information sharing**

Construction of latrines being provided by an agency at a subsidised rate does not imply the regular use and maintenance of the same by all members of the household. Under the IDC the emphasis has been on sanitation as a wholistic package with community participation as the strategy. The strategy relied more on house to house contacts with the ultimate objective being the use and maintenance of the household sanitary units by all the members of the household. House to house contacts and the support of Group Organisers, mainly women beneficiaries of the project facilitated the acceptance of the facilities. An intense system of monitoring the use and maintenance, to continuously identifying defaulters and the reasons thereof enabled the gradual increase in the number of users.

Use and maintenance of the Household Sanitary Latrine Units (HSL units) have registered positive trend over the years both in Phase A and Interim Phase villages. Almost 90-93% HSL units are in regular use in these two phases. Of the units which are in regular use well maintenance too has registered a positive trend over the years. Around 90% of the units are maintained well in these two phases. Even where HSL units are not well maintained scarcity of water is the principal reason. In Phase B too use and maintenance of the HSL units is showing positive trend over the years.

Section IV : Major Lessons

The preceding description of the status of rural water supply in Uttar Pradesh and the efforts made under the IDC schemes highlights certain emerging issues which also form the basis of an overall future strategy to be adopted. The most critical factor to be kept in mind is that a transfer of a system from an agency to the community is in itself a process requiring a step by step approach and careful planning wherein both the community as well as the concerned agencies for monitoring need to be gradually oriented into the new system:

- Separate organisational structure and dedicated resources

  The very nature of operation and maintenance of the rural water supply, both piped water supply as well as handpumps warrant an organisational structure which is separate from the one responsible for the construction and execution of the works. The structure should be equipped with the necessary manpower and regular flow of funds, the norms for which needs to be fixed within certain given parameters.

- Generating user charges

  The community, whether serviced by handpumps or piped water supply, has the willingness and the ability to pay, provided regular and safe supply of water is ensured. Further, the community within the framework of the elected local bodies also has the ability to generate revenue and take decisions on expenditure and could eventually evolve as the sustainable alternative structure for O&M. The critical element here is that water tariff should not be viewed as a politically sensitive issue but as a necessity for ensuring the regular provision of a basic service.

- Planned strategy: information sharing, accountability and transparency, political will

  A community based O&M has better chances of acceptance and survival when the community is involved from the time of planning and siting of facilities. In the case of handpumps the entire process of O&M can be handed over to the community institutions created under the constitutional framework of the rural local bodies (the Panchayats). However, to ensure the sustain ability of the process and structure it is imperative to implement the process in carefully planned stages wherein the critical inputs are awareness generation and sharing information with the community, creation of readily available trained mechanics at the community level, ensuring the availability of standard spares and development of a transparent system of decision making and financial accountability. The technical agency executing the project should continue to give technical monitoring support until ultimately a "service agency -client relationship" is established between the technical agency and the *Panchayats*.

  A similar process, needs to be initiated for the piped water supply schemes which however may require a longer time of technical supervision from the side of UP JN.

  In early 1996, following the guidelines issued by the Rajiv Gandhi Water Mission on converting existing sources to the required standards (Refer letter dated December 14, 1994 on Operation and Maintenance of Water Supply Schemes in Rural Areas) based on water users committees at the habitation and panchayat level, introduction of the concept

of SEMs or Self Employed Mechanics a system of support services at the block level the UP JN issued similar guidelines to its field offices with the instructions to collect Rs. 5 from each of the households in the rural areas serviced by UPJN. However, the experience of UP JN and PSUF in the IDC indicates that a structure and system which is based on the community, through its representative institutions, taking up the major part of the responsibility for O&M will only sustain when the entire process incorporates an element of information sharing, accountability and transparency backed by a political will, failing which it will remain a concept.

Scaling-up of the pilot projects

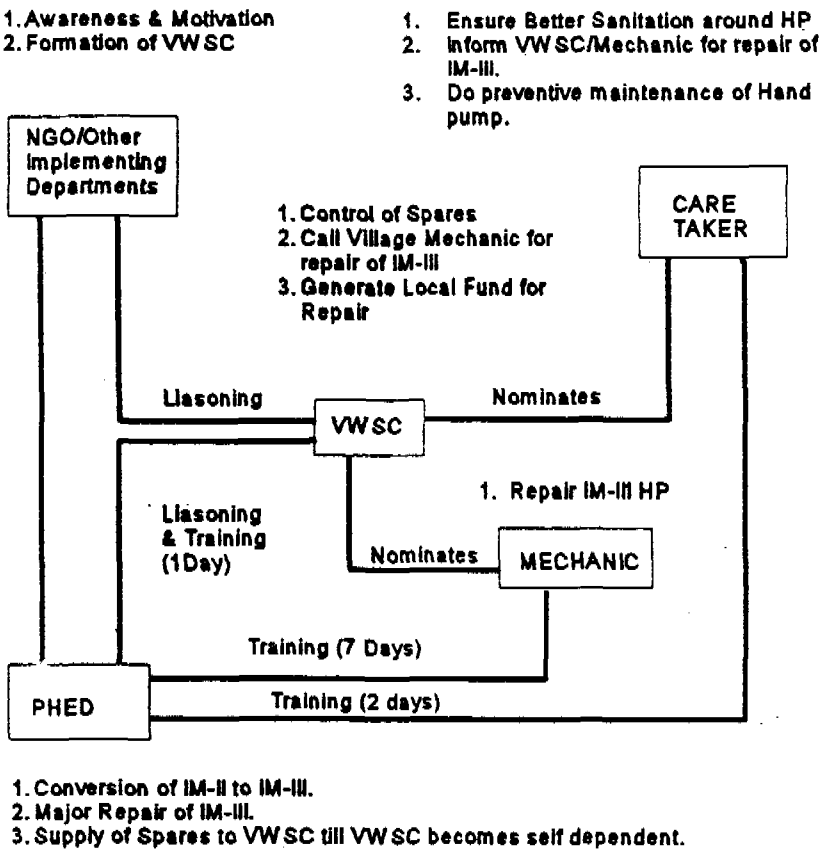
The success of the pilot projects now needs to be scaled up with the entire process of establishment of the alternative community based model being effected over a period of time with the gradual withdraw of the present agency. During this period however the state government should ensure a steady flow of funds for O&M, the subsidy element being gradually reduced as the major requirements are met from the funds generated from the community.

Community Based Hand Pump Maintenance
Case Study : State of Bihar[1]

Case Study I

Community Based Hand Pump Maintenance integrated with CDD-WATSAN strategy in Ranchi district (UNICEF:GOB cooperation)

Mechanism Adopted



1. Conversion of IM-II to IM-III.
2. Major Repair of IM-III.
3. Supply of Spares to VWSC till VWSC becomes self dependent.

Types of Hand pumps : Mix of IM II + IM III HP with about 80% IM-II HPs.
Proportion of Private HP : Nil
Population : Predominately tribal

Key Processes adopted / experiences

- Capacity building of PHED Engineers/Mechanics
- Formation of Village level committees, called as VWSC, as core group to manage the maintenance issues.
- Involvement of PHED engineers/mechanics in training the village mechanic (most of them women).
- Conversion of IM II to IM III (VLOM) HP.
- Gradual ownership of maintenance :
  - Initially quality spares provided as rolling stock.
  - Community collecting funds for repair from users and opens pass book. (Initially village wise funds collection was started which faced problem in recycling, switched to handpumpwise collection - helped the community in identifying with the particular handpump).

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[1]By : S.N. Singh, Consultant, UNICEF, Bihar Field Office

- Availability of spares linked through RSM. Quality spares made available through the manufacturer.
- Has resulted in emergence of individuals who are called beyond their village area for repair and maintenance of HPs.

Lessons learnt

- Cluster approach in conversion of IM II to IM III
- Going for combined IM II + IM III training for 12 days.
- Process to be supported till emergence of strong community group at least for a year after the initial social mobilization and capacity building exercises are carried out.

Scaling up

The mechanism shown above being adopted for transferring the maintenance of IM III Hand pumps (13060 Nos) in 67 blocks of the plateau region being installed under the World Bank aided Bihar Plateau Development Project under implementation by the Public Health Engineering Department, GOB.

Case Study II

Capacity building of existing Community Group (Women's group) towards maintenance of handpump : West Champaran District

Type of Handpump : **TARA Handpump**
Population : **Tharus**

The Women's groups formed through Thrift & Credit mechanism have emerged as a strong group in 164 villages of West Champaran district. Having realized the virtue of "community", the community issues such as maintenance of HP, and even individual latrine construction, 100% with their own contribution through a group loan mechanism, have been taken up by them.

Key Processes adopted

- Orientation training of representative of Community Group (All women) on water and sanitation.
- Evolving the process of community participatory latrine construction and handpump maintenance system, assimilating with the structure of women's group.
- Training of women masons/women handpump mechanic nominated by the group.
- Rolling fund provided for construction of latrine and rolling stock provided for quality spares.
- Availability of quality spares linked with the manufacturer.
- Involvement of PHED engineers/mechanics in training.

Lessons Learnt

- Supportive role of PHED to continue for some time till the groups come out on its own.
- Emergence of new areas : Linking up of TRYSEM training on handpump maintenance, wherever the functional community groups are existing constituted under various programmes. There is a need for suitable modification in the norm of TRYSEM for operationalizing the community based handpump maintenance system.
- The "community groups" need to be provided an identity as true representative of the particular group, may be at hamlet or sub hamlet level, very much distinct from existing community level institution i.e. Panchayat.

Situation Analysis:

1. Total Population: 7,50,21,453
   (As per 1991 census)

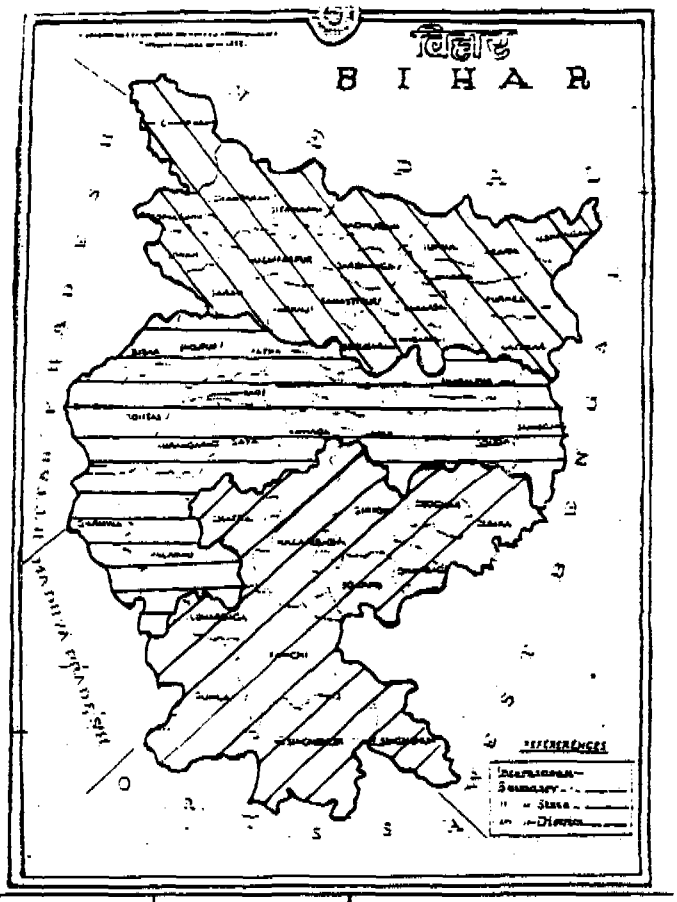
2. Total No. Of Villages: 67503

3. Total No. Of drilled tubewells fitted with IM II/III Hand pumps 172142

4. Total No. Of shallow well Hand pumps* : 759507
   (*Shallow well Hand pumps + Shallow well hand pumps Fitted with cylinders)

5. Spatial distribution of handpump & Population

Zone I Zone II Zone III



Sl. .No.	Zone	No. Of Dists	Population	Type of Handpump	Proportion of private Hand pumps	Socio-Technical Preparedness for community based handpump maintenance	Ongoing effort in decentralized maintenance of HPs
01	I. Plateau Region	12	12839029 (1.26 crore)	IM II/IM III Deep well handpump only	Negligible	Very good	Community based handpump maintenance integrated to CDD WATSAN, Ranchi
02.	II Sub Plateau Region	17	21356731 (2.14 crores)	SWHP HP + SWHP fitted with cylinder +IM II HP in isolated areas	Fairly large no. Of Private. HPS.	Mixed ones	CBHPM under World Bank aided Bihar Plateau Dev. Project in 67 blocks. (PHED to maintain the HPs in other areas).
03	III North Bihar Gangetic Plain	24	40825693 (4.08 crores)	SWHP	Approx. equal to those provided by Govt.	Other issues need to be integrated for social mobilization.	Funds for maintenance spent through Mukhiyas with the help of PHED Mechanics. No. Role of community.

INTEGRATED RURAL SANITATION & WATER SUPPLY PROJECT

COMMUNITY BASED HANDPUMP MAINTENANCE

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PURPOSE OF THE REPORT

The general purpose of this report is to give a brief summary of experiences of the origin, organisation, planning, execution, management and monitoring of a community based handpump maintenance system being implemented in the Integrated Rural Sanitation & Water Supply Project, assisted by Danida, in Tamil Nadu.

INTRODUCTION

An agreement was signed between Government of India and Government of Denmark regarding a pilot phase for an Integrated Rural Sanitation & Water Supply project in Tamil Nadu. The project area comprised of only two coastal blocks in the then South Arcot District. The Project implementation started in October 1990 and will complete in the two blocks in September 96. The Project's development objective was to develop an integrated approach to drinking water and sanitation through health promotion and community involvement. Project activities including establishing of handpumps and sanitary latrines were implemented by Government of Tamil Nadu through the Department of Rural Development and Tamil Nadu Water & Drainage Board with a Project Advisory Group attached. At the field level, Village Councils consisting of former panchayat council members, villagers and local government functionaries were formed and were involved in the implementation of the project activities through participatory approach.

OPERATION AND MAINTENANCE OF WATER SUPPLY SYSTEMS

During the first phase of the project, 1990 - 95, maintenance of handpumps, standposts and other safe sources of water was not part of the project activities. Maintenance of handpumps was primarily looked after by the Block Union Fitters, supported by Additional Fitters who were financially helped by the Project. Since the Fitters could not handle the maintenance of the handpumps entrusted to them, the net result was that an increasing number of handpumps fell into disuse due to mechanical problems. Besides the user groups were not motivated for thier involvement in the operation and maintenance. During project reviews in 1992 and 1994, the need for a suitable user financed handpump maintenance intervention was greatly emphasized and in 1995, a community based handpump maintenance pilot project was introduced.

OVERALL GOAL

To promote sustainable, community based water supply maintenance system.

GENERAL OBJECTIVES

To sensitize the user groups about the importance of community involvement in the use and maintenance of handpumps.

To establish sustainable community groups/organisations to be involved in planning, implementation, management and monitoring of community based handpump maintenance.

To increase the capability of the handpump mechanics for effective preventive and break down maintenance of power pump system.

To mobilise community funds and other financial support services required for the establishment of community based handpump maintenance system.

To develop appropriate data base for effective and systematic monitoring of community based handpump maintenance system.

STRATEGY

Only communtities with a genuine interest and willingness to contribute cash and labour will be eligible for project support. The handpump maintenance service will be established on panchayat basis. The panchayat will choose their mechanics, based on the broad criteria set by the Project Advisory Group and each panchayat will contribute a certain amount for the Maintenance Tools kits (Rs. 1000 for India Mark II tool set and Rs. 500 for the Shallow pump Tool sets). The user groups are also expected to pay (a) for the minor spares including washer, bolts and nuts and (b) service charges of the Maintenance Mechanics. The training is to be preceded by inventory studies and community meetings to establish the attitude among users and to motivate them to accept the system.

The Block Development Office will provide spares for the major replacements including raiser pipes, cylinder, connecting rods etc.

SEQUENCES OF ACTIVITIES

I SYSTEM ESTABLISHMENT

Study of the status of the existing handpump maintenance system.

Hold community meetings and obtain their views and observations about their involvement in community based handpump maintenance.

Finalise the list of panchayats willing to implement the system.

Mobilise community funds for handpump maintenance.

Determine levels of responsibilities of Village Council, Block Development Office, Maintenance Mechanics, Tamil Nadu Water and Drainage Board, Project Advisory Group, District Rural Development Agency.

Conduct the first planning meeting of the Village Council and Maintenance Mechanics and brief them about their roles and responsibilities..

Finalisation of the curriculum design for the training of the Maintenance Mechanics in preventive and break down maintenance of power pumps.

Conduct training course for the Maintenance Mechanics.

II SYSTEM OPERATION

Orient Village Council Members and stress the procedures of future maintenance of handpumps.

Monitor preventive and break down activities to be undertaken by the MMs, Village Councils and Block Development Office.

Assist the MMs in carrying out systematic preventive and break down maintenance.

Formulate indicators, methods and source for evaluation.

IMPLEMENTATION OF COMMUNITY BASED HANDPUMP MAINTENANCE SYSTEM

TRAINING OBJECTIVES

To create awareness among the users on the importance of community based hand pump maintenance.

To motivate the users on proper usage of a handpump and its maintenance.

To assist in regular preventive maintenance services of the hand pump.

To carry out break down maintenance services of the handpumps.

To maintain up to date preventive and break down maintenance records and reports as needed by the project.

RESOURCE PERSONNEL

Resource persons from Project Advisory Group along with TWAD Assistant Engineer, Union Fitters and Additional Fitters were involved in the training. The Field Organisers were also used as Group Guides for effective group dynamics.

TRAINING METHODS & MATERIALS

Learning activities centered on short lecture, class room demonstrations and discussions to introduce specific topics, together with written handouts provided to the participants. The initial discussions were followed by group work in class room and field situations. In order

to facilitate effective learning process, the participants were divided into sub groups and each group was assigned to an Additional Fitter who demonstrated the process involved in (a) dismantling and assembling of handpumps (b) carrying out necessary preventive and break down maintenance and (c) user education methods.

To reinforce better learning process, daily revisions, quiz programme, short group tests, with objective type questions, individual assignments, role plays and social games were conducted.

A detailed manual on 'Preventive and Break Down Maintenance of India Mark II handpumps' was developed in Tamil. The manual covered all the important contents of the training including water and health, India Mark II handpump components and functions, Special Tools, procedures of dismantling and reassembling of a handpump, preventive and break down maintenance, user education, break down maintenance records and role of Maintenance Mechanics in preventive and break down maintenance.

MARAKKANAM

First batch (14 Mechanics covering approximately 184 India Mark II pumps)

To begin with, the Field Organisers were actively involved in creating awareness about the importance of community based handpump maintenance system. A handbill, in Tamil, was developed which highlighted the drawbacks of the existing maintenance system and the advantages of user financed handpump maintenance system. Initially the user groups were motivated to select a Mechanic for 30 to 40 handpumps, covering more than two or three panchayats. But most of the Village Councils and user groups preferred a MM on panchayat basis for better coordination and control. The system was first introduced in Marakknam Block where fourteen village panchayats (out of fifty six) volunteered to implement the user financed handpump maintenance system. The Village Councils selected the MM and contributed Rs. 500 towards the cost of Maintenance Tool kit. They also created separate funds for the future maintenance of handpumps. The first batch MMs, numbering seventeen, including three from Town Panchayats, were trained in August 95.

Second batch (17 Mechanics covering approximately 166 India Mark II pumps)

Subsequent to the first batch training, in Marakkanam, efforts were also taken to motivate the remaining panchayats to join the handpump maintenance system. The Union Fitter was actively involved in the motivation programme. Also, on seeing the successful experiences of the neighboring panchayats, few user groups requested the Block Development Officer to expand the system to their areas. The contribution towards the tool kit was raised to Rs. 1000 (for the first batch the amount was Rs. 500). A total of seventeen panchayats joined in the second batch. The second batch training was held in Tindivanam, (since most of the panchayats were close to this town), during March 96.

Third batch (15 Mechanics covering approximately 190 India Mark II pumps)

After seeing the successful outcomes of the handpump maintenance, a few more panchayts had sent their request to Project Advisory Group to extend the community based handpump maintenance project in their own panchayats. Subsequently the Project Advisory Group along with Rural Welfare Officers and Union Fitter organised mass awareness camps in the remaining panchyats. Altogether sixteen panchyats (including one from Porto Novo) had sponsored their mechanics and the training was held in August 96. The contribution amount remained as Rs. 1000 per panchayat towards tool kit.

MAINTENANCE TOOL KITS

The Project Advisory Group made arrangements with the Project Officer, District Rural Development Agency to procure India Mark II tool kit from TANSI, Madras. There was undue delay in getting the tools kits, for the second batch. Therefore the second batch MMs of Marakkanm were not given the tools on the final day of the training. The delay has affected the process of carrying out suitable post training activities. Few MMs could borrow the tools from the first batch MMs of adjacent panchayats. Finally the tool sets, except connecting rod vice, bearing fixing tool and axle punch, were received after a gap of three months. The Project Advisory Group identified alternate agencies who could supply the India Mark II tools, for the third batch.

PORTO NOVO

First batch (17 Mechanics covering approximately 233 Shallow pumps)

The experiences of community based handpump (IM 2 handpumps) maintenance system introduced in Marakkanam was widely shared among the user groups of Porto Novo block and efforts were taken to mobilise the Village Councils for implementing the user financed handpump maintenance system. Since most of the handpumps, in Porto Novo, are Shallow Suction pumps, the training exclusively dealt on the preventive and break down maintenance of suction (Kumar) pumps. Altogether seventeen (out of 41) indicated their willingness to join in the system and they contributed Rs. 200 towards the tool kit. A four day training was conducted during December 95.

A manual on 'Preventive and Break Down Maintenance of Suction handpumps' was developed in Tamil. The manual covered important topics including water and health, suction handpump components and functions, tools, procedures of dismantling and reassembling of a handpump, preventive and break down maintenance, user education, record maintenance and role of MMs in preventive and break down maintenance.

Second batch (15 Mechanics covering approximately 250 Shallow pumps)

Subsequent to the training of MMs, efforts were taken to expand the user financed

handpump maintenance system to the remaining panchayats of Porto Novo. The motivation strategy was further modified to (a) actively involve the field staff of the Block Development Office (b) involve the trained MMs for mobilizing community awareness and support (c) increase greater community awareness through public address system. The second and final batch training was held in August 96. Fifteen panchayats had deputed their mechanics. The contribution amount was raised to Rs. 500 and the list of tools were further modified according to the field situation. Keeping in mind the problem of delayed delivery of tools, Project Advisory Group initiated action for purchasing the tools directly from a private concern.

POST TRAINING FOLLOW UP VISIT AND REVIEW TRAINING

In order to assess the strengths and limitations of handpump maintenance system and identify the effectiveness of the MMs, post training follow up visits were made. The MMs, in general were contributing break down maintenance services. Wearing of bucket washers was one of the major break downs and in most of the cases, the user groups contributed for the purchase of spares, while the Block Development Office supplied major spare parts. A Few MMs expressed their concern for the repair of handpumps by the Union Fitters without any involvement of the MMs. Therefore necessary instructions were given to the Block staff to avoid carrying out break down services without the knowledge of the local MMs. We also came across a few instances where a few MMs had not given the handpump maintenance cards to the local user groups and break down services were carried out without active involvement of the user groups. Therefore, the Project Advisory Group developed monthly monitoring formats and the MMs and the Union Fitter were asked to send this format every month.

PROBLEMS ENCOUNTERED BY THE MMs

When asked to list the important problems encountered, the MMs indicated the following:

* A Few user groups showing less interest to report the break down of HPs to the MMs.
* Delay in payment of service charges.
* Union undertaking break down repair services without the involvement of MMs.
* Conflict of interest among the user groups in repairing the HPs.
* Adamant attitude of a user group in not paying for the spares.
* Union Staff taking away a few tools without the knowledge of the MMs.
* Lack of interest and awareness about the user financed HP maintenance System

A handbill explaining about the list of panchayats who have been implementing the user financed handpump maintenance system and the name of the MM was circulated during the meeting and the MMs were asked to circulate the handbill for creating increased awareness among the user groups.

MONITORING VISITS BY PAG & TWAD

The effectiveness of the MMs are being monitored by the monthly reports sent by the MMs and Union Fitter. The PAG staff used to combine the field visits, related to other activities, and observe the performance of the MMs through discussion with the user groups and on the spot observation of the handpumps. These visits enabled the team to offer on the field suggestions for improvement. Apart from the combined trips, exclusive supervisory visits have also been made to study the effectiveness of the system. The following are the observations of the monitoring visits:

* Break down services are carried out without any delay and the user groups, in general, contribute for the purchase of spares including washers, bolts and nuts. Major spares including cylinder, raiser pipes, connecting rods are supplied by the Union.

* Most of the MMs receive service charges from the user groups and the amount vary according to tasks to be performed and indiviual negotiations.

* A small number of handpumps are still not working either because of major defects, source failure or indifferent and adamant attitude of the user groups (who feel that the MM should undertake the repair free of cost and also purchase the spares).

* Most of the User Groups have maintained separate funds for the maintenance, but this fund has not been used for the purchase of spares. The user Groups contribute on handpump basis and pay the MM.

* In some places, there was good inter action and sharing of work experiences through letters and personal discussion. The first batch MMs also shared their tools with the second batch MM, who could not get the tool kit on time. A Few MMs, living in adjacent panchayats, also undertake break down repair works jointly and share the service charges offered by the user groups.

* Few MMs do not carry out preventive maintenance routine related to user education on cleanliness of the surrounding of the handpump site, soft handling of the handpump etc. The MMs consider this as a tough and challenging task.

* The quantum of support offered by the Block Development Office, especially in the supply of spares and break down repairs have come down drastically.

* Panchayats who have less number of handpumps still prefer the maintenance system on panchayat basis. They are very reluctant to accept one Mechanics for more than one panchayat because of the fear of incoordination and less support from the other user groups.

Paper distributed at National workshop on O&M, New Delhi, Sept. 25-27

COMMUNITY OWNERSHIP .....Key to Effective Maintenance

Background

India has made massive investments in the Water Supply sector, with remarkable improvements in water supply coverage (currently around 82 percent), but the long term sustainability of the achievements continue to be a matter of serious concern. Significantly, there are over 2.3 million India Mark II deep well hand pumps in the country. As new hand pump installations continue to increase, the Operation and Maintenance infrastructure under the existing centralised maintenance teams, is excessively strained.

As the focus is gradually shifting from coverage to sustainablilty, the Government of India has placed great emphasis in evolving a strategy for effective maintenance of hand pumps.

The changing scenario is leading to transformation of the roles and perceptions of the users as well as implementing agencies, especially with regard to community involvement ..... focussed around repair and upkeep of the water facilities.

Most often, maintenance is seen purely in terms of BREAKDOWN maintenance i.e. action required after a source or facility has stopped functioning or has broken down. Professional help is needed for repair and it is generally assumed that only a centralised maintenance team can fulfil this need.

*However, both **community ownership** and **upkeep maintenance** are important aspects of anycost effective or sustainable maintenance system, and it is here that users of the facility have a major role to play.*

Some Perceptions :

Field perceptions on " Maintenance of hand pumps"..... at the district level varied significantly at different levels. Some of the responses studied are mentioned below:

Sr District Official:		Yes.....we (PRED) have the establishment to maintain hand pumps very (most) effectively. We are already doing this withpover 90% hand pumps in working condition. The department is well equipped to handle any situation. We run a two tier system of maintenance. Records are maintained and breakdowns are attended to within a few days, sometimes weeks. Well, community participation and NGO involvement need to be there, but given necessary funds, transport, we can manage (the maintenance) very well.
AE/Jr Engineer	:	I (with my mechanic team) attend to breakdowns in some 50-75 hand pumps per month. To do more, all I need is a Jeep and a few more men.
Gram Panchayat	:	Successes in the provision of safe water are small in comparison to need. We have some 10 -12 hand pumps, but we need PWS. We also need more hand pumps. Our village is growing fast and we need more water. We don't have funds for this purpose but we require Govt funding. Maintenance is not a problem, they (PRED) will maintain. If we have more money, we can also do it. Our priority is PWS.
NGO -1	:	We want to serve the people. We can work in Ranagreddy but we want direct funding. You tell us what to do, we will do it. Give us a chance and see.

NGO - 2 : We will work for this project as we have experience, having earlier worked with Health, environment and social forestry. As drinking water is a priority, we want to do this now. Training of mechanics is no problem for us as we have a polytechnic trained engineer. Many agencies have appreciated our work.

NGO - 3 : We are a registered NGO. We have worked for establishing self-help (thrift and credit) savings groups, comprising entirely women members. We have trained hand pump caretakers before. Community based maintenance is necessary for hand pumps.For this it is essential to help build community capacities, using effective communication as a strategy. Womens empowerment and environmental concerns will be prioritised. Above all, we will make a determined effort to promote organised team work ..... you may call it CCA!

Bicycle mechanic : Given some training, I too can repair villlage hand pumps. Can I then get a government job? I earn Rs 100/- per day, but it is 12 hours hard work.

HP User(women): This hand pump installed a year ago, has already broken down many times. For months it has remained un-attended. Lalloo (a village mechanic) tried to repair itonce, but failed. We are badly affected. Yes, th eplatform is dirty, but what can I do? So many people use it, water has to collect here. Pray..... you help us.

Analysis:

1. Hand pump maintenance is largely perceived as a complex task..... to be handled by the government. Apparently, this impression is there whenever maintenance is viewed in terms of "BREAKDOWN" repairs.
2. The importance of "PREVENTIVE" maintenance is not adequately reflected as long as hand pump repair work is seen in terms of breakdowns only.
3. Misleading perceptions are responsible for the ill-defined role(s) of the community in the Upkeep and Preventive maintenance of hand pumps. .
4. Ill-defined community roles in upkeep and maintenance lead to lack of community OWNERSHIP.
5. Lack of community ownership undermines the sustainablilty and viability of maintenance systems.

Proposed Maintenance Structure

Responsibility level	Type of Maintenance	Role
User(s) Hand pump Caretaker	Upkeep	(includes ownership..... looking after the HP, care, protection, damage/theft control, clean surroundings, reporting breakdowns)
User(s) Hand pump caretaker Village Mechanic	Preventive	Geasing, alignment, change of washer, tightenning nuts and bolts , Minor repairs etc.
Village Panchayat Village mechanic(s) Centralised repair team	Breakdown	Major breakdown repair(s).

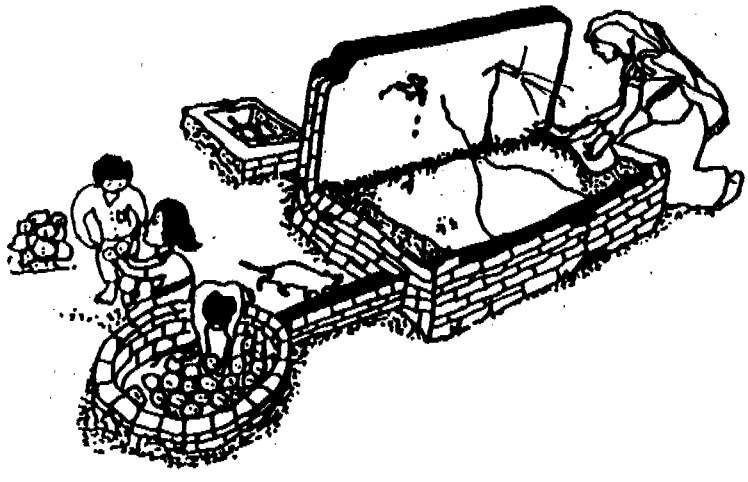
D P Vaish: Project Officer (Water Supply) , UNICEF, Hyderabad.

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi



Compendium of Papers

RAJIV GANDHI NATIONAL DRINKING WATER MISSION

Ministry of Rural Areas and Employment

Government of India

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi

Decentralised Concept of Operation & Maintenance and Policy Environment

K Mazumdar and **Jagdish Chander

A. Introduction

According to the 1991 population census, about 692 million of India's population lives in rural areas. During the pre and immediate post independence era, villages were traditionally dependent on conventional water sources such as open wells, village ponds, rivers streams, canals etc. for their requirement of water for drinking, bathing, washing and all other purposes including provision of water for animals.

Owing to the fast pace of development all over the country, and specially in the rural areas since independence in 1947, there have been ever increasing demands on the available water sources in the rural areas. On the one hand the quantity, once easily and conveniently available, has been progressively decreasing. On the other hand, the quality of water available has become a cause for urgent concern. The available water resources are increasingly becoming vulnerable to pollution mainly from open defecation, domestic activities, agricultural run off etc. and these pose serious health hazards such as diarrhoea, cholera, typhoid, amoebic infections, etc.

Morover, being a tropical country, the summer season in India is specially severe. Most of the surface sources dry up during the summer or become depleted causing hardship to the people, apart from carrying health implications. It was against this scenario that an ambitious programme was taken up by the Government to provide safe and reliable drinking water supply to rural areas by tapping ground water through tubewells and handpumps.

The handpump became an effective measure of the efforts of the Government to provide safe drinking water to people in rural areas. During the late seventies and eighties, the handpump became the living symbol of resurgence in rural areas.

With the growing demand for extensive coverage within a specified time frame coupled with limited sustainable water resources, enhanced frequency of drought, contamination of surface sources in certain areas, water supply schemes based on ground water or river/lake sources (with conventional water treatment plants) were extensively taken up and implemented during the late eighties and nineties.

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B. Operation Maintenance System in Vogue

I. The traditional sources developed by the community and those constructed by the Government agencies viz. dugwells and rainwater harvesting structures are sustained and maintained by the community itself.

II. Handpump Maintenance System

Different approaches have been adopted and attempted with the aim of keeping the maximum number (approximately 2.6 million) of handpumps in working order. Broadly, the approaches fall into the following categories:

(i) Government organised maintenance

(ii) Community or local body maintenance

(iii) Varying combination of these types.

Most handpump maintenance systems can be characterised as one-tier, two-tier or three-tier systems.

One tier system

A one-tier system is one where all maintenanace tasks are the responsibility of a central organisation or where these are undertaken entirely by the community at the village level.

Three-tier System

(a) *Village level* - With the general consent of the villagers, a person who may be an artisan, a literate farmer or a social worker is selected for the job and given a two-day orientation course to enable him/her to attend to minor repairs. The person is also supplied with the basic tools necessary for carrying out repairs. In case a breakdown occurs, the caretaker indicates on two post card the type of repairs needed and posts one to the block level fitter and the other to the district mobile team.

(b) *Block level* - One fitter is appointed at the block level for every 100 handpumps, under the administrative control of the Block Development Officer and the technical supervision of the water supply implementing agency.

Upon receipt of a request from a caretaker, the fitter proceeds to the concerned village and attends to repairs.

(c) *District level* - In case of a major repair, it is the district level team which proceeds to the village immediately upon receipt of the card. The district level team comprises a mobile team with adequate tools and plants and trained personnel (7 to 8 members) capable of repairing the whole handpump at the site itself or replacing the damaged handpump with a new or reconditioned pump. The old pump is taken to the workshop for servicing and repair. One mobile team for 500 handpumps has been recommended. This system for maintenance of handpumps was first introduced in 1976 in Tamil Nadu .

Two-tier system

In some States such as Karnataka, the two-tier system maintenance of handpumps is being followed. After evaluating the working of the three-tier system in some States, we have reached the conclusion that the two tier system may be considered an improvement over the three tier system. The reasons for this are that : a. The increase in number of handpumps at Block level and the number of breakdowns which increased accordingly were beyond the capabilities of the handpump mechanics at village level.

b. Nor was it feasible for the district level mobile team to cover large number of handpumps in a district in terms of time, space and manpower.

C. Norms

Rajiv Gandhi National Drinking Water Mission has adopted the following norms for providing safe drinking water to the rural population :-

a) 40 litres of drinking water per capita per day for human beings.

b) 30 LPCD additional water for cattle in desert districts (under Desert Development Programmes)

c) One handpump or standpost for every 250 persons.

d) Water sources should exist within 1.6 kilometres in the plains and within 100 metre elevation difference in hilly areas.

D. Expenditure Norms

The following expenditure norms were prescribed in 1986 for maintenance of drinking water supply schemes:

a) ***Hand pump Schemes*** : Rs. 400-500 per pump per annum for India Mark II hand pumps and Mark III hand pumps. This has been enhanced to Rs.600/- per hand pump.

b) ***Piped Water Supply Schemes*** : 5% of the cost of the capital cost of the scheme excluding energy charge.

c) The expenditure norm can be suitably enhanced for difficult areas such as desert and hilly areas.

d) ***Gravity flow schemes*** : 7.5% of the cost of the schemes in hilly areas and 8 to 9% for desert areas.

e) ***Shallow tubewells*** : Direct Action Pump (Tara pump) wroks out to Rs.45.00 to Rs.60.00 per pump per annum.

In view of the escalation in costs and the Statewise variations in methodology/agency adopted for O & M, the States may adopt their own norms for expenditure on O & M without seeking approval of the Central Government.

Operation Research Group's Findings on Handpumps

The Operation Research Group, Bhubaneswar carried out a survey on the performance of India Mark II Deep well Handpumps, in 18 Districts in six States of Bihar, Andhra Pradesh, Tamil Nadu, Madhya Pradesh, Rajasthan and Uttar Pradesh. The study was sponsored by UNICEF, New Delhi in 1986 and covered 4840 handpumps in 1864 villages.

The report mentions that a great deal of divergence was noticed in the repair system prevalent in different States surveyed. In fact, differences, although minor, were also observed between districts of the same State.

1) In **Bihar and Madhya Pradesh** Public Health Engineering Department is incharge of maintenance of handpumps.

Observations :

a) In a large number of small villages with scattered habitations and undulating terrain, communication is a major problem.

b) The reporting system envisaged for recording the break down of handpumps does not function properly. c) The hand-pump mechanics available with the institutions are also engaged in installation of new installation and 80% of their time is consumed in such activities, thus affecting the repair work to a great extent. d)Due to fund shortage, purchase of spare parts is greatly restricted.

2) In **Uttar Pradesh** a separate agency called Jal Sansthan has been created to look after the maintenanace of handpumps in hilly terrain. Another agency, namely Jal Nigam, is responsible primarily for installation, but is also involved in maintenance work in non hilly areas in the State.

Observations :

(a) The maintenanace staff including the JEs and AEs are located at the divisional headquarters of Jal Sansthan. Thus they are far from the users of handpumps. There is an acute communication problem in reaching remote villages, even by jeep, especially during the rainy season.

(b) Non-existence of a post office in a large number of villages poses a problem in sending a request for repairs when a pump breaks down.

(c) There is a shortage of manpower at all levels for maintenance of hand pumps.

(d) Non-availability of funds is a major problem.

(e) Lack of coordination between Jal Nigam and Jal Sansthan is also a hurdle for effective O & M of the installations.

3) In **Rajasthan**, the main role of the PHED is to install handpumps and provide back up support to the main repair system, which is organised with the help of self employed handpump mechanics and controlled by the Panchayat Samitis.

Observations :

a) In a rural setting most of the part time workers are seasonal workers. In such cases, the handpump mechanics find it very difficult to leave their main occupation and attend to repair and maintenanace of pumps. This prolongs the breakdown time of the pump.

b) Considering the geographical low pump density, a handpump mistry may have to cover 25-30 villages and travel 15-20 kms. on a bicycle carrying the tools — a process which he finds very arduous. Therefore, there is a tendency to avoid visiting far away villages.

c) Repair of the pump assembly below ground level requires the help of 2-3 local villagers, which the Mistry finds very difficult to mobilise without remuneration. This he finds too costly and hence tries to avoid. The Mistry is paid Rs.8000 per annum to cover 40 hand pumps at the rate of Rs.200/H.P./year.

d) The handpump Mistry is expected to purchase spare parts to the extent of Rs. 100/- To make purchases, he has to go to urban centres which are far away from villages and involve a considerable amount of expenditure, which the Mistry isgenerally reluctant to incur.

4) In **Andhra Pradesh** rural water supply is handled by the Panchayati Raj Department of the Government and implemented through Zilla Parishads of which the District Collector is the Chairman. Maintenance of handpumps comes under dual control in the State.

Observations:

a) Since the pump mechanics are also saddled with the responsibility of installation of handpumps, they are not able to carry out the repair work on handpumps in time.

b) Reporting system is not effective.

c) The Block level mechanics tend to call for the district mobile team more often than necessary, even if they could have managed at their level.

5. In **Tamil Nadu** the maintenance system is entirely under the control of Panchayat Unions. The three-tier system still prevails in the State.

Observations :

(a) Bifurcation of responsibility for installation and maintenanace has created a lot of resentment, uncertainty and confusion among the staff who are transferred from TWAD Board and brought under the control of the Collectors, Divisional Development Officers and the BDOs.

(b) The District and the Block Development Officer are already over-loaded with other Centre and State developmental programmes and do not find time to attend to O & M of handpumps.

(6) **West Bengal** has a full fledged functional Panchayati Raj System. The operation and maintenance of handpumps is the responsibility of Zilla Parishads which get it done through the Panchayat Samitis and Gram Panchayats. There is an exclusive O & M group consisting of a Sub-Assistant Engineer, two mechanics and two labourers at the level of Panchayat Samiti. The spare parts are procured by the Zilla Parishad and handed down. Funds are devolved to Zilla Parishads for maintenance and distributed among the Panchayat Samitis and Panchayats.

Observations:

a) There is hardly any difference from a governmental system as the involvement of the community is non-existent.

b) Close monitoring and proximity to the handpumps enables members of the Panchayat and Panchayat Samitis to get better service from the mechanics.

c) The system is handicapped by shortage of funds.

d) There is a growing realisation among Panchayats that the present system is not sustainable. So several Panchayats are now opting for training of local people and paying them either piece rate or daily wages, whichever is required. The tool kit is maintained at the Gram Panchayat and is available to the mechanic when he is on duty. Initial feed back shows that this system is more effective.

III. Piped Water Supply Schemes

In most of the States, O & M of piped water supply schemes is carried out by the PHED, but in some cases, it is handed over to the local Panchayat after construction, especially when the schemes cover a part or whole of a single Panchayat alone.

Observations :

(a) Local Panchayats are not able to operate and maintain the piped water supply schemes satisfactorily because of

(i) lack of trained personnel to carry out daily routine maintenanace.

(ii) paucity of funds

(iii) lack of institutional facilities

(iv) not being able to engage people to carry out timely and necessary repairs, especially in case of break down of pumping machinery, sluice valves, air valves etc;

(v) non-payment of electricity bills results in power supply cuts and closure of the water supply systems.

(vi) Purchase and storage of chemicals viz. alum, lime, bleaching powder is not carried out on time. (vii) lack of competency in carrying out civil structure repairs and (viii) not being able to enhance cost recovery for O & M.

(b) (i) P.H.E maintained P.W.S. are better off than those maintained by the local Panchayat, but as an institution, the sector thrust is more on funding for new projects. Capital intensive development works have always received priority over O & M of the schemes.

(ii) O & M is neglected during planning and design phases of the project development.

(iii) inappropriate technology adopted without considering the O & M aspects.

(iv) lack of ancillary facilities (e.g. workshop , vehicles etc.)

(v) the job of O & M is not given due recognition and credit.

(vi) backlog of rehabilitation grows year after year and becomes unmanageable at a certain point of time.

(vii) routine and preventive maintenance is non-existent.

(viii) frequent break down maintenance sometimes leads to complete collapse of the system resulting in new capital investment schemes.

(ix) non-implementation of tariff at least for maintenance results not only in paucity of sufficient O & M funds but also develops an indifferent attitude towards the system/amenities provided to the community.

(x) training, management, provision of supplies, applied research and development are neglected in this sector.

(xi) lack of updating and maintaining records of O & M activities makes obtaining information on O & M performance, costs and benefits an arduous task.

Decentralised O & M Finds Expression Through Panchayati Raj Institutions (PRI)

It is evident from the preceding sections that planning, implementation and O & M are being carried out by different institutions, mainly the water supply implementing agencies, the PHEDs and the PRIs.

In a country as vast and diverse as India, it is obvious that a centralised O & M by theGovernment cannot adequately ascertain the specific requirements of the people, involve and motivate them to participate in all rural development activities including provision of water supply systems.

At a time when the country is undergoing major changes in terms of rapid development, there should be more emphasis on grass root initiatives and less on centralised control. The people's right to demand better performance from Government institutions needs to be encouraged. It is only Panchayats which can make that happen more meaningfully. It is this deep seated desire to empower the village masses that has led to the emergence of the new Panchayati Raj underthe 73rd Constitutional Amendment, which was passed as an Act in 1992.

All the major States in the country now have a three-tier Panchayati Raj System i.e. at village, middle and district levels. At the district level there are the Zilla Parishads; at the middle level are the Panchayat Samitis and at the village level there are Panchayats.

The shortcomings of the Panchayat institutions indicated in the preceding paras can be overcome by taking the following steps:

a) ***Devolution:*** Having constituted Panchayats, steps should be taken to make them functional through devolution of adequate powers of planning, implementing,operating and maintaining the water supply system.

b) ***Financial Support :*** Mere transfer of subjects would not make much sense, unless these are backed up by adequate financial support. There is, therefore, an urgent need to devolve adequate finances to PRIs, pending the recommendations of the State Finance Commissions in this regard.

c) ***Mobilisation of Resources :*** Panchayats must be empowered and mobilised to raise their own resources — initially for total O & M cost recovery and subsequently for rejuvenation of the old system.

d) ***Administration Strengthening :*** Keeping in view the increased flow of funds and the responsibilities bestowed on Panchayats, they need to be strengthened administratively and technically. For theinitial phase, administrative and technical staff from the parent department can be recruited on deputation.

e) ***Planning :*** Appropriate mechanisms will have to be evolved for preparation of water supply project/system plans including O & M system keeping in view the socio-economic requirements, the resource availability and the affordability aspect vis-a-vis the community.

f) ***Training & Awareness :*** Newly elected members of Panchayats should be oriented to their new responsibilities through information and education which will equip them fully to take up their new roles of planners and implementors who can sustain the infrastructure developed, (in this case water supply systems). For this purpose all mediums of communication should be used and the process should be a continuous one.

g) ***Transparency*** : The Panchayats must ensure transparency and accountability in their functioning to strengthen the faith of the people in the institutions of self governance.

Social Mobilisation : Panchayats must mobilise people for social development, in particular, health, water supply, sanitation programmes with emphasis on women and child welfare etc.

Recommendations

1) To begin with the Panchayats should be entrusted with all aspects of O & M of water supply system. When the system has been strengthened and equipped, Panchayats should be involved in the implementation of the total water supply schemes and in the process of sustaining the system.

2) National norms for cost recovery need to be formulated and implemented taking into consideration the community below the poverty line and the type of water supply system provided. The norms should be based on the following approach:-

   a) 100% cost recovery for O & M.

   b) For new water supply schemes which are in accordance with the norms laid down by the Union Government, PRI should at least provide land free of cost or contribute 10% of the capital cost of the project, whichever is more.

   c) For water supply schemes in which the PRI desires additional facilities in terms of quality of water and / or installation of drinking water supply points in relaxation of the norms laid down by the Union Government, the PRI should bear the cost difference in addition to the condition mentioned in the preceding para.

3) Water user committee at the Panchayat Level should be formed immediately for proper O & M of the schemes and forawareness creation.

4) Action Plan for sustaining the existing water supply systems should be prepared well ahead of time for effective implementation, especially during the summer and drought periods.

5) The community, particularly women, should be encouraged to participate in the planning, site selection, implementation, completion and O & M of the water supply systems.

6) An effective user friendly information system for public knowledge should be developed.

7) At the National/State level, an award scheme and issue of certificate of excellence should be introduced (annually) in recognition of the outstanding performance of Gram Panchayats in the sector to generate motivation among the other PRIs.

8) Annual workshop at the District/State/National level should be held to discuss the various models adopted in the O & M of the water sector and discuss threadbare the advantages & disadvantages of various systems adopted.

Issues to ponder upon

1. It is an undeniable fact that provision of water supply to people in difficult areas where water sources are scarce and existing sources are biologically and chemically contaminated requires highly specialised technical expertise.

2) Even though PHED is a very strong technical institution, it has not been able to do justice in terms of quality of water in many areas, leading to crippling and lethal diseases such as fluorosis and arsenical dermoteris (due to excess fluoride and arsenic in drinking water). The PHE Departments need reorganisation and reorientation with more focus on software activities.

3) In the light of the 73rd Constitutional Amendment, it is worth pondering upon the line of demarcation between the PRI and PHED, or rather the extent of inter linkage required between the two institutions in terms of their functions, implementation, O & M and financing of schemes.

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

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Finance and Cost Recovery for O&M of Rural Water Supply & Sanitation Systems

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The operation and maintenance (O & M) of the rural water supply and sanitation systems in the country has over the years become a vital issue and calls today for urgent attention. Faced with a resource crunch on the one hand and several sectors competing for limited resources on the other, the Government has to contend with a difficult and challenging set of factors. In the present scenario — in which Rs. 9000 million is required for O & M of existing facilities, while the allocation is only Rs. 2250 million — it may not be possible for the Government alone to finance the O&M water facilities.

Since the First Five Year Plan, there has been spectacular improvement in water supply coverage (83 percent according to the 1991 census). However, with the recent change in norms from 40 to 55 lpcd, distance of water source not more than 1660 to 500 M in the plains and 500 to 100 M vertical height in the hilly areas, the coverage figures are bound to slip down. To achieve full coverage under the new norms, an investment of Rs. 105890 million will be needed. How can financial resources be mobilized through community participation ? Will decentralization of O & M improve efficiency and cost effectiveness ?

This paper discusses the present situation and focuses on O & M funding needs, allocations, cost recovery, case studies involving cost contributions from communities, constraints, and other related issues and suggests a strategy for resource mobilization with particular attention to the limitations and needs of the low income groups.

1. General

Water supply is a State subject and the programme is implemented by the States through their own agencies such as Water Supply and Sewerage Boards, Zilla Parishads, Public Health Engineering Departments. The Government of India has also given adequate importance to this subject and introduced the Accelerated Rural Water Supply Programme (ARWSP) in 1972-73 to assist States and Union Territories with 100% grant-in-aid to implement schemes in villages.

2. Operation and Maintenance of Rural Water Supply Schemes

For smooth operation and maintenance of the water supply systems, it is essential that adequate importance is given to various constraints. Inspite of huge investments, the schemes are not functioning as desired, because of a number of constraints.

These include :-

- Increase in population

- Depletion of underground water table due to excessive drawals
- Lack of co-ordination and planning in execution of rural water supply schemes
- Deficiencies in quality of execution
- Deficiencies in designs
- Rising expectations of the public
- Inadequate financial provisions for capital expenditure
- Lack of institutional arrangements and inadequate financial provisions for operation and maintenance.

3. Sources of Funds for Operation and Maintenance

Even though full financial responsibility for execution of capital works is shouldered by the Government of India / State Governments, operation and maintenance constitutes a challenge which is difficult to meet without help from other sources such as the beneficiaries themselves, coupled with new strategies for cost recovery. The responsibility of operation and maintenance lies with the respective village/Panchayat, but because of lack of adequate finance, technical backup services, etc, many of the schemes are not functioning in accordance with their designed out put.

4. Central and State Government Assistance

The Government of India has assessed the need of financial assistance for maintenance of the rural water supply schemes and accordingly, 10% of the Annual Plan allocations are earmarked for operation and maintenance of rural water supply schemes.

In addition, 10% additional funds are to be allocated by each State for O & M of rural water supply schemes from the State funds allocated for MNP programme.

In Maharashtra State, directives have been issued by the Government of Maharashtra to Zilla Prishads (district level administration) to contribute 20% of their income to the maintenance repair funds for O & M of water supply schemes in their district.

5. Categories of Rural Water Supply Schemes

The categories of rural water supply schemes include:

a. Hand pumps/water pumps

b. Individual village piped water supply schemes

c. Regional rural piped water supply schemes covering more than one village.

d. Schemes under special programmes such as desalination, deflouridation, iron removal etc.

6. Classification of Expenditure

The operation and maintenance expenditure can be mainly classified under the following heads.

a. Establishment

b. Chemicals and lubricants

c. Power consumption

d. Expenditure of repairs and maintenance

A. Establishment

For hand pump operation, the pumps are operated by the villagers according to the necessity for water. Therefore, the need for designating or appointing a special person specifically for operation of the hand pumps does not arise. The services of a self employed mechanic (SEM) are naturally however, required to ensure that hand pump breakdowns are attended to immediately.

B. Chemicals

Chemicals such as bleaching powder, alum etc., are required for disinfection and treatment of water. Lubricants are required for maintenance of pumping machinery, valves,etc. In addition, chemicals of a specified nature are required for special processes like deflouridation, removal of iron etc.

C. Power consumption

This is a major expenditure in individual, as well as regional rural water supply schemes. Several State Governments have offered concessions on power tariff, which is based on connected horse power and not on actual hours of running of motors. These charges are substantially low.

D. Repairs and maintenance

Broadly, repairs and maintenance can be further classified into two categories.

i) Ordinary repairs

ii) Special repairs

In case of hand pumps and in the case of piped water supply schemes, ordinary repair are not a major component of expenditure. Special repairs form the major component which drains the M & R funds.

The special repairs component mainly covers replacement of hand pumps, rewinding of motors, or replacement of the same, replacement of pipelines, which may be due to defective material, or repeated leakages and replacement of sand from filters in treatment units, etc.

7. Financial Constraints

The requirement for capital expenditure as well as maintenance expenditure is increasing day by day. The main objective of the Government is to provide the entire population with a safe and reliable water source. However, the capital works cover not only the uncovered villages, but also improvement and augmentation works. As the schemes are 100% aided, there is a constant demand for augmentation of schemes,for improvements, additional lines etc. — a factor which combines to stretch the financial resources even further.

8. Cost Recovery

The water supply programme approach is based primarily on two principles that were developed by the Nordic donor community and endorsed at the 1992 International Conference on Water and Environment in Dublin. These principles emerged at the end of the International Drinking Water Supply and Sanitation Decade when the sector began to agree that projects must focus to a greater extent on demand and sustainability. The principles are as follows:

a. Water is an economic as well as a social good and should be managed as such.

b. Water should be managed at the lowest appropriate level, with users involved in the planning and implementation of projects.

Managing water as an economic good also implies that the project must be *designed to provide incentives for the efficient and effective use of facilities. There must be a balance between the economic value of water users, the cost of providing services to users, and prices charged for these services.*

9. Sharing of Capital Cost

a. The Rural Water Supply Programme is a 100% subsidised programme. Under the Accelerated Rural Piped Water Supply Programme 100% grants are given by the Central Government and for Minimum Needs Program MC (MNP) 100% are given by the State Governments.

b. If water is to be managed as an economic and social good, it is essential that some burden of the *capital cost is shared by the community* for whom the scheme is designed and implemented. However, the present *political scenario is not favorable* for acceptance of a proposal of cost sharing by village Panchayats towards capital costs for water supply schemes.

c. Moreover,there is a general feeling in the community that supplying drinking water (even at their door step) is the *responsibility of the Government*. Water is regarded as a *free commodity*.

d. In the case of the State of Maharashtra, upto 1985, 10% of the capital cost of the scheme was to be shared by the village Panchayats. But the village Panchayats were not ready to share the financial burden because of their poor financial position.

Further, during times of acute shortage of water, the responsibility of supply of water by tankers to the villages had to be shouldered by the Government of Maharashtra. The expenditure on tankers was quite substantial.

There was a suggestion from Rural Panchayats that funds could be collected as a contribution from such consumers to whom services (house) connection would be given. As the schemes were designed with only *40 LPCD norms*, the house connections could not be accommodated.

The Government of Maharashtra then offered a reduction in the percentage of the capital cost contribution. It was directed that village Panchayat should contribute only 2% of the cost and the remaining 8% would be given to village Panchayats as a loan. However, the villagers did not come forward to bear the burden of even 2%.

The execution of water supply schemes was delayed for years together, as the people declined to contribute 2%. The price escalation in the estimated cost of the scheme due to non payment of 2% cost of the schemes was substantial. It increased the estimated cost of the scheme, of which 98% was

to be borne by Government of Maharashtra. Considering all the pros and cons, the Government of Maharashtra revised the policy, and the *precondition of sharing of capital cost by the beneficiaries, was withdrawn*, (even for C-1 class municipalities).

Therefore the re-introduction of the criteria of contribution by the village Panchayat for the capital works of water supply does not seem to be feasible at this stage.

e. The introduction of A.R.P. programme with 100% grants from the Government of India made the cost contribution more difficult in the State funded programme. Some villages under ARP were executed with 100% GIA (grant in aid) and some villages under MNP were executed with 90% GIA and 10% contribution (2% cash +8% loan) from the local village Panchayats. This disparity, which was not based on any sound principles, could not be justified by the Government.

10. Operation and Maintenance Cost

As water supply is a State subject, there is no uniform policy on the O & M costs in all the States . In some States O & M expenditure is undertaken/incurred by the State Government, in some States by Zilla Parishad, by State Boards, and also by the village Panchayat.

With the introduction of the 73rd Constitutional Amendment, the responsibility of O & M will vest with the rural Panchayats only. However it will take a few more years for the rural Panchayats to actually shoulder this responsibility, which will depend upon the political will, apart from various other factors.

Cost recovery estimation

For estimate of the cost recovery the main classification will be:

a. hand pump and

b. piped water supply.

Hand pumps

Statewise data on hand pump population is available only for the period 1993-96. The age composition of the pumps is unknown, hence no adjustment can be made either for depreciation or for accounting of hand pumps which might have crossed the life span.

The total number of hand pumps in India as in 1994, is estimated to be of the order of 25.8 lakhs of which only about 90% (i.e. 23.28 lakhs) are in working condition. This would mean that the rate of source becoming defunct, due to different reasons, is about 10.8% per annum.

For arriving at the rate of recovery, the life of the hand pump, population covered with the hand pump, the cost of the hand pump and the expenses on operation and maintenance of the system are required. It can be assumed that the life span of the hand pump is 10 years, approximate average is 250 persons per hand pump, the capital cost is @ Rs. 15000/- and the direct operation and maintenance cost is @ Rs. 600/- per pump per year.

Based on the above figures the rate of recovery per pump is calculated as follows:

i)	Annual capital cost recovery (Rs. 15000/10)	Rs. 1500.00/ year
ii)	Annual operation & maintenance	Rs. 600.00/ year
iii)	Total annual recovery	Rs. 2100.00 / year
iv)	Number of benefactors who can contribute	250 persons
v)	Per capita cost / per year for full cost recovery	Rs. 8.40
vi)	Per capita O & M cost/ year	Rs. 2.40

The requirements of funds for O & M with full cost recovery and without full cost recovery is indicated in Table 1.

Table - 1

State/UT	Number of working handpumps	O&M cost (Rs. in lakhs) @ Rs. 2100 per pump	O&M cost (Rs. in lakhs) @ Rs. 600 per pump
Andhra Pradesh	186493	3916.35	1118.96
Arunachal Pradesh	20	0.42	
Assam	100050	2101.05	
Bihar	606584	12738.26	
Goa	206	4.33	1.23
Gujrat	54644	1147.52	327.86
Haryana	55	1.15	
Himachal Pradesh	4069	85.45	
Jammu & Kashmir	330	6.93	
Karnataka	134016	2814.34	
Kerala	3635	76.33	
Madhya Pradesh	248265	5213.56	
Maharashtra	104066	2183.39	
Manipur	1558	32.71	
Meghalaya	684	14.36	
Mizoram	537	11.27	
Nagaland	23	0.48	
Orissa	134822	2831.26	
Punjab	323	6.78	
Rajasthan	113270	2378.67	
Sikkim	–	–	
Tamilnadu	132778	2788.34	
Tripura	6018	126.38	
Uttar Pradesh	374056	7855.17	
West Bengal	120450	2529.45	
U.T.S.	2226	46.74	
All India	**2329178**	**48912.73**	13975.07

It will be seen from Table 1 that for O & M alone (without considering the cost required to replace the hand pumps) Rs. 139/- crore are required. The cost of O&M would be Rs. 600/- for 250 persons i.e. Rs. 2.40 per person per year. Assuming that 20% of people are below the poverty line, the cost per capita per year would work out Rs. 600/ 200 Rs. 3.00 per persons per year.

12. Piped Water Supply Schemes

Systematic and consolidated data on piped water supply schemes is not available. The ceiling cost criteria of investment per capita, have been issued by a number of States. On an average, 4% of cost can be set aside for O&M of the pipe water supply schemes. If the per capital cost is Rs. 800/-, the O&M cost will work out Rs. 32/- per person per year i.e. Rs. 13.33 per family per month. Since the Government of India, and the State government are giving subsidy, the actual taxation expected is much less. Number of financial models can be worked out to make the scheme self supporting for O&M.

13. Actual Cost Recovery

The position of actual cost recovery, even with 100% cost subsidy from Government for capital works, is not satisfactory. A sector plan study carried out for Tamilnadu State is indicated in Table 2.

Table - 2

Cost Recovery in Rural Town Panchayat

(Rs. in Lakhs)

Year	Water Charged	Annual Maintenance	Deficit
1990-91	33.16	178.78	145.62
1991-92	36.36	217.47	181.11
1992-93	38.21	288.67	250.46

It can be observed that the revenue assessed is grossly inadequate for meeting the maintenance charges.

Further, there is a gap in recovery which is indicated below :-

Year	Water Charges in lakhs		Recovery
	Billed	Collection	%
1990-91	33.16	21.37	64.40%
1991-92	36.36	23.65	65.00%
1992-93	38.21	24.88	65.10%

The above figures clearly indicate how poorly this sector is managed as far as the recovery part is concerned.

14. Cost Recovery in Latur District of Maharashtra State

For familiarization with the ground situation, the author visited Latur district in the second week of July 1996. The observations on some important schemes are as follows:

Regional Rural Water Supply Scheme to 20 villages in Latur and Ausa Taluka

This regional rural water supply scheme was undertaken under World Bank Assistance and was sanctioned in August 1991 with an estimated gross cost of Rs. 3,69,98,100.00. The cost was revised to Rs. 9,96,20000/0.

The scheme has been designed according to World Bank Norms, with adequate provisions for house connections. The scheme was designed with an irrigation dam as the source, and a filtration plant was provided to treat the raw water. In short, filtered and disinfected water was supplied to the villagers.

The scheme was operated by Maharashtra Water Supply and Sewerage Board for a period of about 6 months including the summer season of 1995. Normally, schemes are not taken over by Zilla Parishads immediately after the trial rural. However, in this case, since the quality of work was quite good and the people were happy with the level of service, the scheme was taken over by the Zilla Parishad, Latur, for day to day maintenance with effect from 24.08.1995.

The proposed taxation was :-

Water supply tax per house for total 2780 houses at the rate of Rs. 150/-	Rs. 5,67,000.00
House Connection 1620 numbers at the rate of Rs. 350 per connection per year	Rs. 5,67,000.00
	Rs. 11,34,000.00

15. Taxation Introduced by Zilla Parishad Latur

After taking over the scheme for day to day maintenance, the Zilla Parishad is yet to introduce taxation. All the expenditure which may actually be more than the above proposed recovery of Rs. 11.34 lakhs per year, is being met from the funds of the Zilla Parishad.

Regional rural Water Supply Schemes of latur district being maintained by Maharashtra Water Supply and Sewerage Board

Table - 3

Details the regional rural water supply schemes being maintained by Maharashtra water supply and sewerage board on behalf of Zilla Parishad Latur

All Figures in Lakhs

Sr. No.	Name of Scheme	Number of Villages Covered	Year of Commissioning	Expenditure in 95-96 (excluding power) with ZP (Rs. in lakhs) Estt.	Other	Total	Total outstanding dues	Remarks
1.	RRWS Scheme for 47 villages	47	1976	11.88	4.54	16.42	143.87	Expenditure on power consumption is not included.
2.	RRWS Scheme to 6 villages (KINGAON)	6	1988	5.08	1.33	6.41	23.56	Raw Water charges to be paid to Irrigation Deptt. are not included.
3.	W.S. Scheme to Chakur village	1	1988	1.48	1.86	3.34	14.50	
4.	RRWS Scheme 5 villages (Walsangi)	5	1988	3.46	2.49	5.95	25.26	
5.	M&R to Asundi Dompuri	1	1979	3.23	0.83	4.06	35.97	
	Total			25.13	11.05	36.18	243.16	

Bills for power consumption were paid to Maharashtra State Electricity Board (MSEB) by Maharashtra Water Supply and Sewerage Board (MWSSB) a few years back.

However, since the power connection is in the name of the Zilla Parishad, MWSSB stopped paying the bills to MSEB and the bills received are passed on by MWSSB to the Zilla Parishad for payment. The Zilla Parishad is not paying the electrical energy charges either. Similarly, the raw water charges which are to be paid for using raw water from notified rivers, are also not paid to the Irrigation Department by the Zilla Parishad.

The dues outstanding on account of maintenance of the scheme by MWSSB from Latur Z.P. are Rs. 2.43 crores. The Z.P., State Govt. and MWSSB are aware that these arrears cannot be recovered.

This is the picture of one district of Maharashtra State. Maharashtra Water Supply and Sewerage Board is maintaining 104 such schemes (all over the State), on behalf of Zilla Parishads and the outstanding dues on this account are 71.00 crores as on 31/3/1996.

Further, it is interesting to note that although MWSSB is incurring this expenditure in many districts, the M&R grants received from the Government of India and the State Governments are passed on only to Zilla Parishads and not to the MWSS Boards. Zilla Parishads utilise the M&R grants for schemes and hand pumps being maintained by them (which are either handed over by MWSSB or which are constructed by ZP). MWSSB has appealed to the State Government to allocate some amount of M&R funds to the MWSSB as well. Besides, a demand that ZPs/VPs be made to take over the schemes has also been raised.

The grants released to Zilla Parishads by the Central/State Government for maintenance of Rural Water Supply Schemes are given in Table 4.

Table - 4

All figures in Lakhs

Sr. No.	Financial Year	Grants for State Schemes	O&M Govt. of India ARP Schemes	Total
1.	1986-87	400.00	–	400.00
2.	1987-88	470.39	–	470.39
3.	1988-89	500.00	273.00	773.00
4.	1989-90	392.00	228.63	620.63
5.	1990-91	608.71	331.00	939.71
6.	1991-92	564.00	298.00	862.00
7.	1992-93	478.00	285.54	763.54
8.	1993-94	478.00	549.00	1027.00
9.	1994-95	660.00	618.00	1278.00
10.	1995-96	1021.00	802.00	1823.00

A point of interest is that even when a total of Rs. 8957.27 lakhs has been given so far by State/ Central Governments, no money is passed on to MWSSB for schemes maintained by them.

What has been described above is the picture of only one district of Maharashtra State, where only a few schemes are maintained by MWSSB. Similarly, in other Districts too MWSSS is maintaining RRWSS on behalf of ZP. But the MWSSB is not in a position to recover the cost of M & R from the ZPs. The total scenario of Maharashtra State for the schemes maintained by MWSSB is given in Table 5.

Table - 5

No. of R.R.W.S.S.	No. of villages covered	Av. yearly Expenditure (in Rs. Lakhs) done by MWSSB	Total outstanding arrears as on 31.3.96 (in Rs. Lakhs)
104	930 + 27 Padas	838.59	4722.06

O & M of individual WSS by Village Panchayat

In an individual WSS, W.P.s have a good sense of belonging i.e. feeling that the scheme is owned by them and the responsibility of maintenance is also their responsibility.

A study of 16 individual schemes maintained by VPs in Solapur district was carried out and it was found that the results are very encouraging. The water tariff has been fixed by the VPs on their own. Even though the schemes have been designed for a standpost supply, the GPs have given individual house connections. Water supply per capita per day, in excess of 40 LPCD, is obtained by increasing the pumping hours.

The table below shows the expenditure and income for the year 95-96 and also the tariff.

Sr. No.	Name of	Population 1996	Total No. of taxable	No. of house connection	No. of standposts	Expenditure for O&M for 1995-96 Rs.	Revenue collected in 1995-96 Rs.	Loss or Profit	Tariff structure Rs. per year per No.		Remarks
									1/2" Conn.	Gen. Water tax	
1	2	3	4	5	6	7	8	9	10	11	12
1.	Shirwal Dist. Solapur	3637	391	257	6	18360	37390	19030	125	9	
2.	Aurad Dist. Solapur	3680	270	270	6	53201	53817	616	270	0	
3.	Wagadari Dist. Solapur	6642	1088	394	10	34692	43042	8350	101	18	* For population
4.	Tadawal Dist. Solapur	3940	258	0	6	5981	4656	-1325	0	24	* For Backward classes
5.	Baramani Dist. Solapur	7310	510	420	12	38310	99342	61032	200	18	
6.	Bhandarkawathe Dist. Solapur	5955	670	364	10	56920	70638	13718	150	18	
7.	Darganhalli Dist. Solapur	2405	239	94	5	11700	13722	2022	101	18	
8.	Hattur Dist. Solapur	6220	501	300	9	11666	19811	8145	1500	18	
9.	Kumbhari Dist. Solapur	10780	1537	539	4	49180	72370	23190	101	18	
10.	Mandrup Dist. Solapur	11110	1510	200	21	111753	128819	17066	200	18	
11.	Borgaon Dist. Solapur	3198	120	120	7	24605	26936	2331	150	24	
12.	Batode Dist. Solapur	3221	448	150	5	25500	7984	-17516	150	10	
14.	Ghodeshwar Dist. Solapur	4170	230	210	6	23706	38787	15081	150	24	
15.	Savaleshwar Dist. Solapur	2832	596	139	10	13988	25761	11773	150	24	
16.	Ankoli Dist. Solapur	3532	488	110	10	9100	19450	10350	100	18	

It can be seen from the above table that the GPs are able to maintain the schemes and to recover the cost.

Maintenance of RRWSS by ZP

(Case study of R.R.W.S. for 3 villages Ashti, Modnimb, Shetphal in Solapur district)

This scheme was initially maintained by the MWSSB and subsequently handed over to the ZP without MWSSB's staff, as ZP was reluctant to absorb the staff of MWSSB. The point to highlight is that ZP did not employ any staff for day to day maintenance but entrusted the work of O&M to a private contractor. The tender cost is Rs. 2.00 Lakh/year approx. The private contracter is supplying water in bulk upto the service reservoir of the VP. Further distribution is done by the VP. The contractor is supposed to fill up the service reservoir normally once in a day and obtain the signature of the VP. The ZP is charging the VP on the quantum of water supplied by the contractor. The present rate is Rs. 1.10/1000 lit. which is now proposed to be increased to Rs. 1.70/1000 lit.

The contractor's total bill per year is roughly to the tune of Rs. 2.00 lakh, and the bill charged to the GP is also nearing Rs. 2.00 lakhs/year. The shortfall if any in recovery from the VP is met by ZP from its own resources. The ZP also recovers the balance cost (unpaid water bills by VP) from the other grants payable to VP.

VPs are charging individual connection holders and have also introduced general water cess on the lines given in the table.

Willingness to pay

Willingness to pay is dependent on the following factors:

1. Level of service
2. Family status/income
3. Recovery Administration
4. Time factor

1. Level of Service

It is generally noticed that if the level of service is satisfactory there is a general willingness to pay water charges.

2. Family Status/income

Willingness to pay also depends on the status and income of the family. People nowadays are reluctant to go to the standposts and collect water because of their status.

People prefer to have house connection, and to pay, because of the better facility. Payment is also timely due to the fear of disconnection for non payment.

3. Recovery Administration

Where the recovery administration is prompt in submitting bills and strict in recovery, more willingness to pay is observed.

4. Time factor

Nowadays, because of Government schemes such as Nehru Rozgar Yojana/EGS all the eligible family members get employment. Therefore, they have no surplus time to spend in collection of water from a distant source. Time has become more valuable to them. Therefore, if there is saving of time, they are willing to pay for the services.

Observations

1. Individual schemes are generally well maintained and adequate taxes are levied by the VPs to meet the day to day operating expenses.
2. In the case of R.R. Schemes legally owned by the ZP, but which are maintained by other agencies viz. State Govt./Boards, the ZPs have a tendency not to pay the water charges to the maintainence agencies.
3. Where R.R. Schemes are maintained by the ZPs, it is possible for them to recover at least the partial cost from the VP.
4. ZP can also entrust the work of O&M to a private agency, which can be more effective in case of R.R. Scheme.
5. Political will, community participation, training of the persons at grass root level are the essential ingredients for success of the schemes, not only from technical point of view but also from financial point of view.

Conclusions

1. **O & M of Rural Water Supply**

   In view of the 73rd Constitutional Amendment, the responsibility of maintenance of individual WSS should invariably vest with the VP. The responsibility of a scheme for a group of villages should be with the ZP.

2. Privatisation of O&M activity should be encouraged and scope of privatisation should include water billing and recovery.
3. Political will is an important landmark in effecting cost recovery.
4. The present pattern of allocating O & M funds by GOI should have some relation to the actual recovery of O&M charges collected by the state.

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

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Current Rural Water Supply O&M Systems in Madhya Pradesh

V. K. Jain

1. Preamble

Madhya Pradesh, the largest state of India in geographical terms, has 45 districts with 71526 inhabited villages. As on 1-6-96 , 292833 hand pumps (mostly India Mark-II) had been installed in the rural areas of Madhya Pradesh. Excepting 283 villages, at least one hand pump has been installed in each village for 250 population, and one hand pump has been installed for a population of 100 in SC/ST Tolas. The total inhabitations(Majra/Para/Tola) excluding main habitations are 87688, out of which 14063 are yet to be provided with a safe source. Thus a total of 14346 inhabitations inclusive of 283 main villages and 14063 majra/para/tola are proposed to be covered during the current plan period.

As regards per capita supply of water, there are 25143 villages where water supply is less than 40 Lpcd and therefore, additional water sources need to be created.

For villages having a population of 2000 and more, 3320 piped water supply schemes have been completed. In addition, 183 schemes are partially complete, while work is in progress in 114 villages. In the case of small villages with deep water tables,a distant successful source i.e. spot source with power pumps has been developed in 1141 villages.

2. Present O & M Systems including Financial & Institutional Aspects

2.1 Construction

The state Public Health Engineering Department has been entrusted with theresponsibility of planning, preparation and execution of all rural water supply schemes. Except for some large districts i.e., Bastar and Bilaspur, which are looked after by two Executive Engineers, all remaining 43 districts are managed by one Executive Engineer each. For two to three blocks in each district, there is one Assistant Engineer who is supported by a team of about 5-6 Sub Engineers, in construction and execution of the rural water supply and sanitation programme. The mechanical wing headed by a Chief Engineer undertakes the drilling of tubewells with a fleet of 156 drilling rigs. Contractors rigs are engaged to cope with increased quantum of work every year.

2.2 Maintenance

All the handpumps constructed under the Rural Water Supply and Sanitation Programme are maintained departmentally with the help of 2956(1661 regular + 1093 work charged + 232 daily wages) hand pump mechanics. Thus, there is one hand pump mechanic for about 85 hand pumps. The procurement of hand pumps and their spares is made by the department

through M.P. Laghu Udyog Nigam (a subsidiary of the state Govt.) on yearly rate contracts with due care to quality control. The funds for maintenance are provided by the state Govt. @ Rs. 500/- per hand pump.

However, after the establishment of Panchayat Raj as a result of the 73rd Constitutional Amendments, the responsibilities of maintenance of hand pumps have been transferred to block level Panchayats and Gram Panchayats. The administrative control of one A.E. in each district and one Sub Engineer in each block along with hand pump mechanics have been transferred to Zilla Parishad and Block Panchayats respectively. Similarly, the non plan funds for maintenance @ 500 \- handpump/year has also been transferred to Zilla Panchayats which releases the funds in two instalments to Block Panchayats and Gram Panchayats depending upon their role in maintenance. The spares are provided from subdivisional stores of the department or procured from the market.

The intimation about defective/non-functional hand pumps is given to the hand pump mechanic directly or by post card or through registers kept at block headquarters. The down time varies from 3 to 15 days depending on fault developed & availability of spare parts etc. There is hardly any preventive maintenance. Some of the tubewells have been rendered unservicable due to falling of suction lines or collapsing of tubewell or its getting filled up or drying of the source. The villagers hardly provide any help to hand pump mechanics, who in case of major repairs engaged local labourers if necessary. There is practically no contribution from villagers in maintenance of hand pumps. The execution of the entire hand pump scheme is financed by the Government.

2.3 Piped Water Supply Schemes

All the piped water supply schemes were handed over tothe Gram Panchayats for maintenance. Later on the responsiblities for major repairs such as repairs of pumps, motor, starter, valves etc., upto Rs. 15000 \- for O.H. schemes and Rs. 9000 for other piped water supply schemes was assigned to P.H.E.D. During scarcity, the non functional Piped Water Supply which were not being maintained by Gram Panchayats, were run and maintained by the Deptartment during summer only, from scarcity funds from the Panchayat Department.

With the installation of Panchayat Raj, the entire responsibility of maintainance of PWS has been entrusted to Gram Panchayats though the department still provides the technical support. An amount of Rs. 10000 \-, Rs. 16000 \- and Rs. 20000 \- is provided to the Gram Panchayat in two installments for maintainance of spot source, PWS schemes with tubewell source and schemes with surface source respectively. The performance of some of the piped water supply schemes also suffers due to diminished yield of tubewells, collapsing of the tubewell, damaged distribution system, inadquate voltage or interruption in power supply etc. Only in case of a few selected piped water supply schemes, Rs. 10 to 20 per month is collected for house connection from individual families towards mainteinance.

The system is maintained by locally employed personnel and repairs are carried out by the hand pump mechanic or through other vendors. There is no contribution from villagers in the capital cost.

3. Performance of O & M System

On an average, about 5% of the total hand pumps had been rendered nonfunctional due to either filling or collapsing of tubewell or falling of suction pipes and cylinders or drying of the source. At

any time, about 5-6% handpumps remain out of order, and are repaired periodically with a down time of 3-15 days on an average. The performance was effectively monitored when the PHED was responsible for maintenance. Now the village Sarpanch, who owns the responsibility of maintenance, does not report about the nonfunctional systems, thus rendering monitoring ineffective, The same holds good for PWS systems but there is more sustained pressure on the Sarpanch for attending to repairs for PWS due to comparative higher user population.

4. Level of Community Participation & O & M Cost Recovery

The entire Rural Water Supply Programme is being executed by the Government without any contribution in capital cost from the beneficiaries. The handpump schemes are maintained from funds exclusively made available from the Government exchequer. The PWS are also being maintained in a similar manner, except forsome nominal monthly cess being collected in some cases for house connections. Community participation is more or less confined to making a demand for providing water supply system. The cost recovery is limited to a small fraction of the total maintenance in case of PWS schemes for house connections only.

However, there appears to be a welcome change in attitudes at village level with the transfer of responsibility of O & M to elected representatives which, if properly channelised with required technical inputs, may prove useful in the future.

5. Constraints Affecting the Performance of Systems

5.1 The various constraints affecting the performance of systems have been identified as under:

1. Absence of feeling of community ownership and lack of knowledge of the inherent advantages of water supply systems.
2. Widely scattered facility and inadequate transport facilities.
3. Non availability of trained manpower locally.
4. Defective or non satisfactory construction of platform and installation.
5. Difficulty in timely procurement of good quality spares and T & P.
6. lack of community participation specially women .
7. Lack of any incentive / disincentive.
8. Lack of information, education and communication in the community.
9. Lack of NGOs or other organisations to support O & M supports.
10. Depletion in ground water table.
11. Intermittent power supply and voltage fluctuation .
12. Increasing water quality problems such as iron fluoride and salinity.
13. Absence of preventive maintenance system.
14. Low priority in O /M systems due to political and other consideration.
15. Inadequate financing in limited cases.

16. Transfer of large number of development activities to Sarpanch / Block Panchayat President without adequate office support.

17. Inadequate remuneration and lack of guidelines for the role of Secretary Gram Panchayat.

18. No avenues for promotion of HP mechanics.

6. Key O & M Issues

1. The depletion of the ground water table has emerged as a key issue. All national and rural employment programmes should lay maximum emphasis on water conservation and recharging activities particularly on the pattern of watershed management and catchment area treatment.

2. Planned Activities suggested in (1) alone will also minimise the water quality problem in respect of iron, flouride, salinity.

3. Strong IEC activities to promote community owenership, participation in capital cost and full O & M responsibilities, involvement of women in O & M.

4. Human Resources Development Programme to train manpower engaged in O & M with thrust on preventive maintenance.

5. Active involvement of NGOs and other institutions.

6. Improvement in power supply and its voltage.

7. Establishment of WS and sanitary marts.

6.1 Gender Aspects

Sufficient emphasis has not been laid on promoting women's participation. A twelve days training in maintenance of HP was given to 10 to 15 women participants in each district with UNICEF assistance. In the pilot project in Betul district managed by an NGO with UNICEF assistance, it has been proved that women can actively participate in O & M of HPs, particularly India Mark -III pumps as well as preventive maintenance, improvement of the environment around HPs. The women participating in O & M should be imparted training in other professional trades to generate additional income for the family.

7. Funds Allocation v/s Requirements and Need for Resource Mobilisation

Before the O/M of rural WS system was transferred to local elected bodies, the PHED was allocated Rs. @ 500 /HP from non plan funds at its disposal, including funds made available by diverting 10% of plan funds as per ARWSP guidelines for maintenance of HPs. Sometimes, additional funds under scarcity head were also allocated for lowering / replacing suctions pipes and repairs of platform and drainage. In some cases the cattle troughs and washing platforms were also constructed around handpumps from JRY funds.

The department could manage the O/M of handpumps as the newly installed handpump required less expenses compared to old handpumps and weighted average of Rs. 500 per hand pump proved adequate. Besides,the department had 242 mobile units spread over 45 districts to undertake major repairs at short notice.

Similarly the department was allocated funds for undertaking major repairs on items such as submersible pumps and motor, starters, valves & pipe lines. The department was also allocated additional funds for Panchayat Departments and scarcity, and had to run and maintain defunct PWSS or those PWSS which were either not taken over for maintenance or not being run by the Gram Panchayat.

The scenario has changed with the transfer of O & M responsibiliy to local bodies as already discussed in para 2 above. The O& M of systems presently under transition has yet to be estbilished and needs to be studied in detail till it settles down.

Some of the Facts that Emerged During Field Visit are Highlighted :

1. With the transfer of field staff under administrative control of local body, they are yet to reconcile to their role in achanged environment as they draw their salary from PHED but work under administrative control of local bodies.

2. Funds for O & M of HP and PWS had been allocated to Zila Panchayat who in turn transfer funds to Block/ Gram Panchayat, depending upon their role. In case of Vidisha district (for which case study was undertaken) out of first installment of Rs. 250 for HP system, Rs. 100 for each HP was given to Block (Janpad) Panchayat to arrange for spares, T & P and hiring vehicles for repairs and Rs. 150 per handpump to Gram Panchayat for engaging labourers for repairs.

3. Though PHED stocked sufficient spares in sub divisional head quarters, the same were also procured from the local market.

4. The PWS are maintained by the Sarpanch of the Gram Panchayat for which technical assistance is presently provided by PHED. Rs. 10000 for spot source, Rs. 15000 for PWS and Rs. 20000 for Surface Source Schemes are being provided to the Sarpanch of the Gram Panchayat.

   Since the O & M of Rural Water Supply System is still in its last phase of transition, a realistic assessment of funds allocation v/s actual requirement was not possible but there is no denying the fact that the funds allocated are becoming inadequate in view of the increased cost of labour and material. There is also an acute need for resource mobilisation, not for only O & M but also for building up an inventory of handpump spares to reduce downtime for repairs, replacement of T & P etc. However, it is desirable that additional resources should be generated from beneficiary communities by promoting a sense of ownership and their active participation. There is ample scope to economise on O/M cost by proper training, quality control, preventive maintenance, procurement of quality spares and T & P, prevention of wastage etc.

8. Implications(Past, Present and Future) of 73rd Amendment on O & M Systems

There are far reaching implications of the 73rd Amendment on O & M of rural WS system. The PHED which till recently was entrusted with O & M responsibility, had to play a new role in a changing scenario. The responsibility in respect of manpower training, procurement of spares and T & P, economising and streamlining the O & M operations, sustaining of water resources, technical guidelines, input of new and cost effective technology etc. could be entrusted to PHED.

There are reasons to believe that a phased transition of responsibility of O & M systems would have enabled the new flag bearers a better understanding about their responsibility and effective role to be performed in discharge of their duties. This has been particularly observed in respect of elected representatives from thereserve quota for women/SCs/STs, who have no previous experience of works now assigned to them. Special attention needs to be given to such cases. A suitable committee could be appointed in these cases to help the elected head in the discharge of his duties.

The elected members should be fully informed about their duties and responsbilities and the consequences resulting from cases of failure. There should be adequate provision for punishment where wilful misappropriation or purposeful negligence is noticed. Instances have been reported to the effect that O/M of systems have remained unattended due to political rivalry, and practically zero or inadequate allotment was given for areas where election results went in favour of opposition candidate.

The elected head had been showered with so many administrative and development activities that he is unable to cope up with them, particularly in the absence of any effective and accountable Secretariate support.

There is a need for effective monitoring of the changes brought by the 73rd Constitutional Amendment with mid term appraisals of development programmes, targets and achievements. Suitable modifications in the Act should be made periodically to achieve the purpose for which the 73rd Constitutional Amendment was passed by Parliament.

A lot of prepatory work is necessary to evolve a feasible decentralised O & M system. The inherent weakness of the system has to be evaluated and corrective measures have to be taken accordingly. It may be necessary to phase out the responsibility of O & M in a planned manner smoothly so that the existing O & M arrangements are not dislocated.

9. Innovative Experiences from RWSS Projects and Lessons Learnt

(1) Piped water supply scheme with KfW assistance

The KfW mission, which financed execution of piped water supply schemes in the state had laid emphasis on following aspects :-

(a) Adequate hydrogeological investigations for sustainable water sources.

(b) Preparation of a detailed project report with techno-economic considerations.

(c) Full utilisation of resources to the best possible advantage with full cost recovery on O & M .

(d) Assessment of indicators of health parameters.

(e) Participation of the community in O & M .

(2) Replacement of non standard hand pump with India Mark-II handpump with Danida Assistance

A replacement of non standard hand pumps with India Mark-II hand pumps was undertaken in selected districts of the state along with thesetting up of iron removal plants in Bastar district. This programme highlighted the following aspects :

(a) Importance and necessity of installing a standard and good quality hand pump for trouble free operation.

(b) Importance of monitoring water quality and need for development of low cost technology for iron removal.

(c) Community participation in O & M .

(3) Innovative Experience in Respect of Preventive Maintenance of Hand Pumps in Selected Blocks

UNICEF had been instrumental in launchinga preventive hand pump maintenance programme in selected Blocks of the state, on apilot project basis. The performance of this project, if evaluated by UNICEF, can help in evolving a suitable strategy for preventive maintenance with community participation.

(4) Innovative Experience in Respect of Community Participation in O & M in Betul Block through NGO with UNICEF Assistance

A pilot project involving community participation was taken up through an NGO with UNICEF assistance in Betul Block of Betul District in Madhya Pradesh. The project envisages replacement of hand pumps with India Mark-III hand pumps, imparting training to women users in maintenance & repairs of pumps, cost recovery from beneficiaries, community participation. A documentary on this success story prepared by UNICEF will prove useful for purposes of replication.

10. Strategy for Improved Maintenance System

A well chalked out strategy has to be formulated after an indepth study of weaknesses and constraints of O & M system. However, the broad features of a possible IEC strategy can be listed as under -

(1) **IEC campaign:** A very strong & well designed IEC campaign has to be launched for creation of awareness in related fields to develop a feeling of ownership in the community towards the water supply and sanitation programme. Community participation can be induced if the necessity and importance of these programmes is demonstrated effectively.

(2) **Public contribution :** The future water supply and sanitation programme in areas already covered under minumum need programme should be taken up on firm commitments of local bodies in respect of O & M of systems now being developed. Priority be given to such projects in which the community is prepared to contribute towards capital cost also.

(3) **H.R.D. :** The Central and state Goverments should allocate adequate funds under each development plan for training of personnel. The programme launched by GOI for training of grass root level workers marks a very good beginning and such H.R.D. programmes have to be further extended to cover the target group. These programmes should be monitored and appraised periodically & mid-term correction/improvement shouldbe incorporated. Regional institutions, community polytechnics, NGO's should be actively involved in the H.R.D. programme.

(4) **Introduction of incentives and disincentives:** The Government should clearly provide for incentives to the communities who undertake O & M responsiblity. This could be in the form of cash or additional facilities for future development.

(5) **Preventive maintenance :**The IEC strategy and human resource development / training programmes should give highest priority to introduction of preventive maintenance with community participation to minimise breakdowns and economise on O & M system.

(6) **Quality control :**Great emphasis should be laid on quality control in tube well drilling, installation of pumps, construction of platform, drains, washing platforms and cattle trough as well as procurement of hand pumps, spares and T & P etc. The pumps, spares and T & P should be procured from reputed manufacturers or their authorised agents or sanitary mart etc., on approved rates. Regular supplies can be ensured through annual rate contract with accredited manufacturers with proper networking for distribution.

(7) **Sustainability of Source :**All possible efforts should be made to improve the sustainability of sources with emphasis on water conservation and recharging, watershed management, recharging ground water, regulating extraction of ground water, particularly in areas affected by water table depletion and those suffering from problems of quality i.e., Iron, Fluoride and Salinity.

(8) **Power Supply :**The state Electricity Boards should be advised to give special treatment/preference to power connection to water supply source to minimise interruption & voltage fluctuation.

(9) **Role of three tiers of Panchayat Raj :**The role and responsibilities of the three tier i.e. District Panchayat, Block Panchayat and Gram Panchayat have to be clearly defined and suitable guidelines have to be issued for mutual coordination. Appropriate manuals for O & M at each level have to be developed for guidance and technical support.

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

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New Delhi

Rural Sanitation

Current O&M Systems in Madhya Pradesh

V. K. Jain

Preamble

The programme for rural sanitation got a boost after it was entrusted to the PHED in the year 1993-94 — a fact borne out by a glance at the following table which shows the number pour flush latrines installed.

Year	Funds available (Rs. in Lacs)	Funds utilised	No. of units installed	
			Target	Achievement
1993-94	498.32	427.91	15000	18021
1994-95	442.765	442.765	30000	36160
1995-96	436.77	486.77	40000	41422

The PHED launched the programme in awell planned manner by constituting aDistrict level committee under the chairmanship of the Collector, launching awareness campaigns at state and district level, training of male and female masons and mobilising community participation. Reputed institutions like theSafai Vidyalaya, Ahmedabad, Institute of Rural Management ,Jaipur, UNICEF etc., contributed to a great extent in mobilisation and capacity building amongst participating agencies. The unit cost of Rs. 2500/- was subsequently revised to Rs. 2700/- during the year 1996 in view of the increased cost of cement and other while the mode of funding remained 20:40:40 percent for beneficiary, State and Centre respectively.

While the construction of rural household latrines under the programme was quite satisfactory, the progress of other components e.g. village complex for women, drains, and other sanitation facilities was negligible. Similarly, the setting up of sanitary marts picked up initially but faded out for want of necessary support in the field. This programme has now been handed over to Gram Panchayats for execution of O&M.

Performance of O&M Systems

All the individual rural latrines were constructed as per prescribed standard i.e. pour flush with twin leaching pits but theconstruction material used varied depending upon local availability. Some latrines units were also constructed under State Guniea worm Eradication Programme implemented with UNICEF assistance for households and in schools. Practically all the units constructed are in

use but their operation and maintenance isinadequate. The problem of emptying of latrine pits has not been realised yet. There was hardly any response for construction of a sanitary complex for women on account of problems associated with its maintenance.

Level of Community Participation in O&M Cost Recovery

Community participation is forthcoming from the better off group amongst the economically weaker section of the community. The criterion for selection of beneficiaries is very vague and left to the discretion of the Sarpanch in the absence ofany guidelines. The question of O&M cost recovery arises only in thecase of the sanitation complex for women and is likely to give rise to problems.

Emphasis has to be laid on coverage of other segments of the community to motivate them to construct sanitary latrines on their own, and provide all technical guidance to them. The criterion of allocating 10% of central funds exclusively for a sanitary complex needs to be viewed.

Constraints Affecting Performance of the System

The constraints affecting the performance of the system can be listed as under:

- As the entire funds have been transferred to elected institutions, there is no nodal organisation to formulate and implement the IEC and training activities which are of vital importance for success of the programme. Continuous monitoring and evaluation of programme at all stages is necessary for smooth coordination and implementation.
- There is no clear demarcation of the roles of the three tiers of Panchayat Raj at district, block and village level.
- The sanitary complex for women has not found favour with rural communities on account of its O&M problems. This component of the rural sanitation programme has to be reviewed and suitably modified. Greater emphasis has to be given to develop community ownership & induce community participation.
- The other activities in respect of drains and other sanitation facilities i.e. soakage, garbage pits, smokeless ovens, washing platforms, cattle troughs have evoked poor response from the community. These activities are vital for upgradation of environmental sanitation.
- The concept of sanitary marts has not taken off, and needs to be strengthened and more broad based to cover drinking water facilities as well. The private sector may be involved if need be.
- The importance of sanitation is yet to be inducted in the curriculum of schools.
- Low cost and appropriate technology such as shallow sewer system adopted in Brazil and other developing countries has to be introduced, depending upon local conditions.
- Non availability of suitable NGOs
- Lack of trained manpower and H.R.D. ACTIVITIES.
- Low priorities.

Key O&M Issues

- Defining the roles of three tier units of Panchayat Raj.
- Development of guidelines and manuals.
- Strong IEC, HRD,and training activities.
- Equal emphasis on other components of rural sanitation programme.
- Review of approach on community latrines with emphasis on payment for use by beneficiary.
- Grant of incentives to segments of the rural community other than economcially weaker sections for improving overall village sanitation.
- Earmarking of certain percentage of funds under JRY, Employment guarantee scheme & other programmes for rural areas for sanitation.
- A clear definition of economical weaker group, middle class and higher group.

Funds Allocation v/s Actual Requirements and Need for Resource Mobilisation

The utilisation of the entire funds available under therural sanitation programme, particularly for individual pour flush latrines and demand for more units clearly highlights the shortage of funds and the need for resource mobilisation. This programme needs to be made more broad based by providing certain incentives to the middle income group.

Implications of the 73rd Contitutional Amendments on O&M Systems

The implication in the field of rural sanitation will be far less significant compared to the water supply programme due to the73rd Amendment as the major responsibility in this field is now assigned to Gram Panchayats. Thus, the Sarpanch has to play a very important role and the success or failure will depend on his capacity. The Sarpanch has now been entrusted with so many responsibilities that he will find it difficult to cope up with them. This problem will be more acute in case of women, SCs, STs, Sarpanches who lack the desired administrative capacity. The district and block president can play a very significant role in IEC, HRD and Training activities as well as the role of a sanitary mart. The Gram Panchayat has to play an all important role in O&M. The PHED Department has to associate itself for quite sometime in this programme particularly, in the field of awareness building and other IEC activities.

Innovative Experience from Rural Sanitation Projects and Lessons Learned

There was only one integrated water supply and sanitation project taken up with UNICEF assistance in 3 villages for Indore district. This project envisaged construction of P.F. latrines for the entire village, open drains, refuse disposal and IEC activities. The most important lesson learnt can be summarised to the effect that an entire village is an ideal unit for sanitation programme and its success depends on the positive attitudes and self felt necessity of the community.

A Strategy for Improved Maintenance System

i) The nodal department has to be made responsible for IEC, HRD and training activities as well as monitoring and evaluation of the programme. NGO's expert institutions have to be involved in these activities along with elected representatives at all levels. The training and HRD activities have tobe made more intensive at Gram Panchayat level.

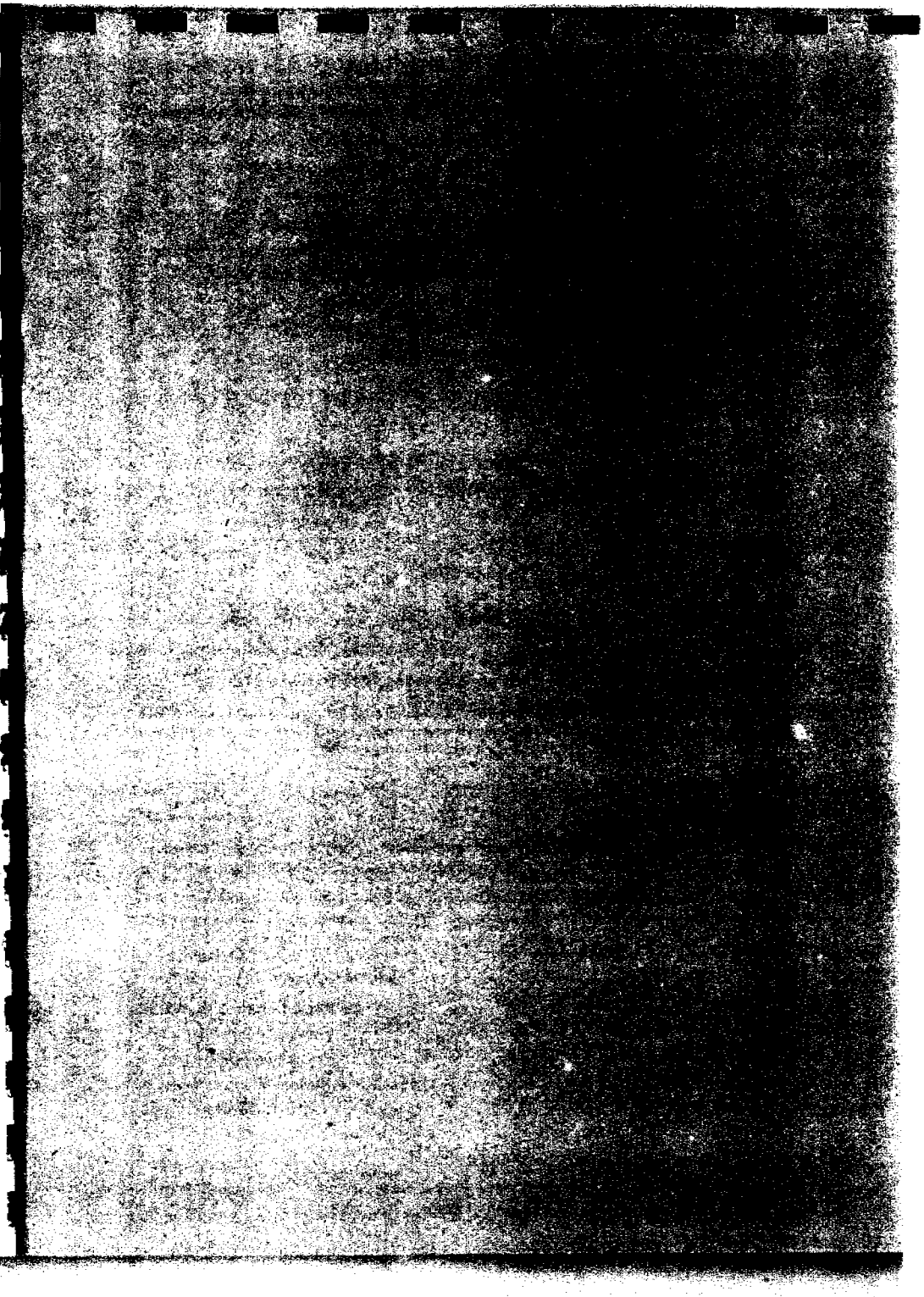
ii) The availability of related material and technical support has to be improved either through sanitary marts or by involvement of the private sector with due quality control at reasonable cost.

iii) All possible efforts have to be made to involve economically better off sections of the community by providing some incentives.

iv) The role and responsibility at district, block and Gram Panchayat level should be defined clearly.

v) Special committees should be constituted for implementation of programmes to support and help the Sarpanch who may find it difficult to handle the programme.

vi) Equal emphasis should be given to other sanitary facilities for overall improvement of the environment to promote active participation of the entire rural community.



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Rural Water Supply Schemes in Andhra Pradesh and Existing O&M Systems

R. Kondala Rao

Currently, safe drinking water is provided to rural areas by means of:

a) Bore Wells fitted with hand pumps.

b) Mini PWS. Schemes with single point distribution.

c) PWS. Schemes, either individual or comprehensive with distribution and net work.

Funding

The funds are provided under:

a) State Plans (MNP)

b) Government of India (ARWSP)

c) Drought Relief Funds under Natural Calamities.

The Works are sanctioned by Zilla Parishads upto a cost of Rs. 10.00 lakhs in respect of State Plan Funds and by the State Government when the amount is above Rs. 10.00 lakhs. Government of India/State Government sanctions for PWS. under PM/ARWS. funds.

Administrative Set up

Technical : All Rural Engineering Works, including Water Supply and Sanitation, are looked after by the Panchayati Raj Engineering Department (PRED).

The Department is headed by an Engineer-in-Chief who will be supported by a number of Chief Engineers for various sectors such as RWS., Rural Roads, Rural Buildings, Employment Generation Works like JRY. E.A.S. etc. There is one Superintending Engineer (PR) at District level with 3 or 4 Executive Engineers and their subordinate staff. They all look after all the different types of work and there is no functional separation.

Powers of Technical Sanction

Deputy Executive engineer	Rs. 50,000
Executive Engineers	Rs. 2.00 lakhs
Superintending Engineers	Rs. 10.00 lakhs
Chief Engineers/Engineer-in-Chief	above Rs. 10.00 lakhs.

Administrative Wing : The Panchayati Raj, Rural Development and Relief Department is incharge of rural development works. A cabinet rank Minister is heading the department. A principal secretary is heading the Department at the Secretariat level. The Panchayati Raj has a 3 Tier set up.

Zilla Parishads at District level.

Mandal Parishads at Mandal level

A Mandal consists of 20,000-30,000 population with 15 to 20 Gram Panchayats.

Village Panchayats at village level.

RWS. Sector is kept at Zilla Parishad level

P.W.S. Schemes

So far, 22 Comprehensive PWS Schemes and 15,425 Individual PWS Schemes have been constructed in Andhra Pradesh. The maintenance of PWS Schemes is done in the following manner.

Individual PWS Schemes

As already mentioned, there are 15,425 individual PWS Schemes. The PWS Schemes normally consist of:

1. A bore well as a source and ground level reservoir or OHSR and pumping and distribution arrangement.
2. Surface water as sources with treatment by slow sand filtration/rapid sand filtration and distribution to the villages.
3. Digging infiltration wells in the river beds and then pumping the water to the various villages. A public stand post is provided for every 200 persons. The per capita demand provided varies from 40 LPCD to 50 LPCD.

The policy of the Government is to hand over all individual PWS Schemes to the Gram Panchayats for maintenance. The Gram Panchayat under the act can levy water cess over house tax upto certain limits. (Normally, the higher limit is 20% of the house tax which can be collected as water tax.)

Instructions have been issued to all the District Collectors for formation of village water users Committees at the habitation level, with the Sarpanch as Chairman. Instructions are also given to include Mahilas (women) in the Committee. Generally,the Panchayats levy some tax on the users for this purpose and wherever individual service connections are given they collect from them a monthly charge ranging from Rs. 10 to 20/-. At the time of giving the connection, they collect a capital amount ranging from Rs. 500 to 2,000/-.

Instructions were given to the Superintending Engineers that the quantum of water available in the system should be verifiedbefore giving any service connections and allowing the Gram Panchayats to permit house service connections.

Further instructions were issued to the District Administration to utilise 10% of MNP/ARWS funds for maintenance and operation of the PWS Schemes wherever the non-plan provisions are not sufficient or when major investments are required when Panchayats are not able to maintain the scheme satisfactorily, due to major break downs such as bursting of the pipelines, source failure or pumpsets burning and going out of order.

The Government has made a complete payment of Electricity charges for the PWS Schemes to the Andhra PradeshState Electricity Board in the case of all the Minor Panchayats.

Comprehensive/Regional Schemes

All Comprehensive Schemes are maintained by the P.R. Engineering Department since they cover more than the Gram Panchayat. The Government provides funds for maintenance of these schemes

from the State Budget under the non-plan sector. 50% of the maintenance cost will be borne by the Gram Panchayats, either by means of recovery from the amounts due to the Panchayats or by obtaining the costs directly from the Panchayats. The funds provided during the last 3 years for the maintenance of Comprehensive Schemes are :

1993-94	Rs. 215.85 lakhs
1994-95	Rs. 215.85 lakhs
1995-96	Rs. 107.92 lakhs

As far as the functioning of Comprehensive Schemes is concerned, a separate section or a sub-division or a division is established with necessary fields staff such as mechanics, fitters, electricians etc., depending upon the volume of work.

Bore Wells with Hand Pumps

Terrain : Most of the terrain is hard rock areas and hence a dependable source is a deep bore well.

At the beginning of the programme, the maintenance of hand pumps was handed over to the Gram Panchayats . When this arrangment was found unsatisfactory, the Government took a decision to maintain the handpumps departmentally. The Panchayati Raj Engineering Department has been looking after the maintenance of hand pumps in the State since 1979.

In the initial stage of the programme, an amount of Rs. 200 per pump per year was provided for maintenance of hand pumps. The provision was increased to Rs. 360/- during 1982. During 1992, the Government increased it to Rs. 425/-, keeping in view the increase in cost of spares, fuel and salaries to crew members. The maintenance grant was subsequently increased to Rs. 600/- per hand pump per year, in G.O.Ms. No. 581, P.R.D & Relief Dept. (RWS.I) Dt. 15.9.94. 50% of the cost is recovered from the Gram Panchayats from the amounts due to them.

The tentative break up for the grant released for hand pump maintenance and spares is as follows:

Cost of Maintenance of Each Hand Pump

1.	Cost of spare parts for one hand pump per year	Rs. 280.00
2.	Maintenance of supporting vehicles including fuel and repair for one vehicle to take care of 1000 pumps.	Rs. 60.00
3.	Establishment charges of pump mechanic drivers & Helpers.	Rs. 250.00
4.	Cost of maintenance Tools & Fishing tools	Rs. 25.00
		Rs. 615.00
	or Say	Rs. 600.00

Bore Wells Maintenance Systems

3-Tier Systems

The working of the three-tier system is as follows :

1st Tier	-	District/Divisional level
	-	One Mobile team for 500 H.Ps
2nd Tier	-	Block/Mandal level
	-	One Pump Mechanic for 50 Hand Pumps.
3rd Tier	-	Village level
	-	One Caretaker for each H.P. (Honorary).

This system is working well, but the requirement of pump mechanics and mobile teams has gone up due to an increase in the number of hand pumps over the years.

2-Tier Systems

The mobile teams at divisional level in the 3-tier systems are shifted to thesub-divisional level.Theblock/mandal mechanic is dispensed with and accommodated in the mobile team in the 2-tier system. The availability of a mobile team at Sub-divisional level helps in improved mobility with full equipment and enables coverage of a greater number of hand pumps (750 to 1000).

To begin with, the 2-tier systems was implemented in 6 districts of Mahabubnagar, Rangaraddy, Kurnool, Ananthapur, Cuddapah and Chittoor. Under this system there is an overall improvement in working of hand pumps and the breakdown period has been reduced considerably. There is a need to procure additional vehicles to constitute mobile teams in order to extend this system to remaining districts. The response from caretakers is below expectations.

Crash Programme During Summer

To meet the drinking water scarcity in summer, the Department organises Crash Programme for bore well hand pumps maintenance in all the districts of Andhra Pradesh for 45 days every year during January/February. During this period in addition to departmental mechanics and mobile vehicles, additional pump mechanics and mobile vehicles are hired,according to the need, to check up and attend to the maintenance of Hand Pumps/PWS/MPWS,schemes, defunct schemes and keep them in working conditions during the summer season.

So far, 2.27 lakhs hand pumps have beeninstalled and their maintenance is looked after by the Department. 143 Mobile Teams (approximately one for every 1550 handpump) and 1140 Pump Mechanics have been deployed for maintenance.

The expenditure breakdown of the salaries of staff and the maintenance of vehicles is as follows.

a)	Salaries of Mechanics-Avg. Approx. 1140x4000x12 per month Rs. 4000/-	Rs. 547.20 lakhs
b)	Salaries of Drivers of 143 Mobile vans @ Rs. 4000/- p.m. (Approx.) 143x4000x12	Rs. 68.64 lakhs
c)	Salaries of Helpers of 2 Nos. per Mobile Team @ Rs. 3000/- p.m. (approx.) 286x3000x12	Rs. 102.96 lakhs
d)	Annual Maintenance of cost of 143 Mobile Vans (@ Rs. 65,000/- per annum per van) 143x65000	Rs. 92.95 lakhs
	Total	Rs. 811.75 lakhs

***Status of Hand Pumps** **

No. of Hand Pumps fixed	2,26,688
No. of Hand Pumps worked	1,99,023
No. of Hand Pumps under repairs	7,888
No. of Pumps Mechanics working	1,140
Mobile Team functioning	143
No. of bore wells condemned due to becoming dry or collapsed completely since beginning	19,777 (9%)
No. of Hand Pumps which function seasonally out of the working pumps.	11,000 (5.50 % nearly)

**(As on 31.3.1996)*

Experimental Projects

Decentralised System (Rajasthan Mistry Type System)

A pilot project has been taken up by the Department in two sub-divisional areas to decentralise the maintenance of Hand Pumps. The system is similar to the Rajasthan Mistry System, in which rural unemployed youth are entrusted with maintenance of hand pumps in and around their native village.

Initially, the selected youth are trained and exposed to practical experience of repairs for 3 months. On completion of training, each youth (Mechanic) is entrusted with maintenance of 50 to 60 Hand Pumps located around his resident village. He is paid an amount of Rs. 100/- per Pump per year towards repairs charges.

The Department is responsible for supplying the required spares and the mobile team will provide backup support for any major breakdowns. The work entrusted to these youth is on a contract system.

Cost Recovery System

To create a positive responsibility of the user community towards upkeep of the Hand Pumps a 'Cost Recovery System' is also being experimented within selected areas. A voluntary organisation called VIP (Village-in-Partnership) has taken up the responsibility of maintenance of Hand Pumps in 31 villages in Mahabubnagar District in Andhra Pradesh.

These villages are registered with the voluntary agencies. The focus is on looking after their water supply and other needs. About 20 youths from these villages are selected by thevoluntary organisation and given training for Hand Pumps maintenance. The voluntary organisation and village development committee (VDC) will be collecting Rs. 5/- per house hold per annum from the villages towards upkeep of the hand pumps. The collected amount is kept as a revolving fund to pay an honororium to the youth as and when they attend to repairs. There is no regular salary payment to the youth .

The department will be supplying the spare parts and the voluntary organisation will account for proper utilisation. The results received so far show that the pumps in the villages are working well. After some more time of study, this system will be extended to areas where a realistic voluntary organisation comes forward.

Experimental Projects for Maintenance of Hand Pumps

Pargi and Kurnool

Two sub-divisional areas in Pargi and Kurnool have been selected to decentralise the maintenance of Hand Pumps and to create awareness in the user committee so that they can take care of the pumps in the villages. It is proposed to transfer the maintenance of Hand Pumps to the Gram Panchayats of the two sub-divisional areas selected on an experimental basis. The concept is to involve the village (GP) in maintenance of Hand Pumps.

The youth selected from the village by the Gram Panchayat will be given training on maintenance techniques for about 3 months. After the training, the village Hand Pump Mechanic will enter into an agreement with the Gram Panchayats to attend to preventive and curative maintenance of hand pumps situated in the Gram Panchayat Area.

On an average there may be about 10 Hand Pumps in a Gram Panchayat Area. The Gram Panchayat will be paying Rs. 100/- per hand pump per year to the trained Mechanic towards Maintenance and repairs of the Hand Pumps. The Executive Engineers concerned were asked to identify and select suitable youth in consultation with Mandal Development Officer's and Gram Panchayats. The Executive Engineer (PR) Chevella has already identified 74 youth candidates for training of approximately 3 months as village hand pumps mechanic (VHM's). Similar action from Kurnool is awaited.

Training

It is proposed to conduct training for selected candidates for a period of 3 months. The P.R.E.D. will take care of training the candidates on the field besides sharing 50% cost of training.

The District Collector will provide stipend for the candidates for 3 months period @ Rs. 300/- per month from TRYSEM Grants. UNICEF will share 50% cost of the training and supply special tools sets to the trained Mechanics. The Gram Panchayats will procure standard tools required for routine repairs and will pay the trained Mechanics @ Rs. 100/- per Hand Pump per year.

The following amounts are provided under Non-Plan for Maintenance of Bore Wells.

1993-94	Rs. 705.00 lakhs
1994-95	Rs. 1132.00 lakhs
1995-96	Rs. 598.82 lakhs*

* Balance 50% cost of the Maintenance charge i.e. Rs. 598.82 lakhs is being borne by the Gram Panchayats.

Proposals for Transfer of Hand Pumps Maintenance

In the proposed transfer of maintenance of Hand Pumps to Gram Panchayats, it is proposed to redeploy the existing Mechanic and Mobile Teams as follows:

1. One Mechanic for each Mandal.

2. One Mobile Team for each division Head Quarters and one additional mobile team in aconvenient central place in the division depending upon the number of Hand Pumps.

3. The Department will continue to meet the expenditure towards salaries and maintenance of mobile vans as is being presently done.

Regarding the proposed transfer of maintenance of Hand Pumps to Gram Panchayats the following activities have to be carried out.

1) The transfer to Gram Panchayats should be in a phased manner after the Gram Panchayats are oriented and equipped to take up the responsibility.

2) Depending upon the number of Hand Pumps in a Gram Panchayat, including its habitations one/two village youth have to be trained on Hand Pumps, whenever it is required.

3) The training for these village youth in a very sub-divisional area will be provided by the Dept., which will be for a period of one month.

4) During the training period, the village youth (Mechanic) will be paid stipend from TRYSEM grants.

5) The training includes installation and maintenance of hand pumps and the youth will be given practical training along with the department mechanics/mobile teams.

6) After the training, the village mechanics will be in a position to attend to the maintenance of Hand Pumps in the Gram Panchayat Area.

7) The village mechanics have to be provided with necessary tools by the Gram Panchayats.

8) Depending upon the number of hand pumps to be maintained in a Gram Panchayat Area, the village Mechanics have to be paid a remuneration ranging from Rs. 10/- to 20/- per hand pump per month.

9) The Gram Panchayats should raise necessary resources to pay the remuneration to village mechanics and to procure the required spare parts.

10) On an average, spares costing about Rs. 250/- to 300/- per hand pump per year have to be procured by the Gram Panchayats.

11) The entire responsibility of maintenance of hand pumps will be taken over by the Gram Panchayats. The department mechanic in the Mandal along with mobile team will however extend necessary technical help guidance for any major repairs.

12) All the new installation of hand pumps and platform constructions will be attended to by the mobile teams/mechanics.

Performance of O&M Systems

It is observed that in respect of thetwo tier system the percentage working of the borewells is normally upto 90% where as in respect of the three tier and other system it is around 75 to 80%. Instructions were issued to the field staff that repairs should be carried out within 48 hours of failure of bore well. However in reality it is noticed that bore wells are repaired in a period ranging from 1 day to 7 days depending upon the type of repair and the distance involved.

The Rajasthani Handpump Mistry type System is in an experimental stage and is under observation.

In respect of PWS Schemes (both Individual and Comprehensive), minor repairs are attended within a day or two, while major repairs are attended within 3 days. Discussions with Departmental Officials have revealed that major break downs like failure of source etc. will take considerable time to rectify (ranging from 15 days to a month), depending upon the identification of the source and construction of new source etc.

Level of Community Participation and O&M Cost Recovery

Bore Wells : The level of community participation is very minimal here and the schemes are maintained solely by the department. In the case of cost recovery, 50% if the cost if recovered from the Panchayats from the amounts due to them.

PWS Schemes : In respect of individual schemes, the Panchayats contribute certain amounts for sanction of works with State funds (Details in Annexure) and maintain the schemes by raising some taxes within the Panchayat itself under the Act provisions. On the whole, around 4.5 percent (659 out of 15,525 schemes) are not in working condition. The only point to be mentioned here is that there should be a quality control check on the water delivered. In the recent past, a number of laboratories have been installed in most of the districts and the quality of the water is being monitored.

Constraints Affecting Performance

1) Panchayats do not have proper technical personnel to guide them about quality of water. Only the P.R. Engineering Department is there to assist them, along with other work.

2) Sufficient funds are not available with the Panchayats for affective O&M.

3) Non availability of spares or electrical pumpsets spares in the near by vicinity in interior places.

4) Power breakdowns.

Funds Allocation of Works Approval Requirements

In respect of CPWS schemes till 1994-95 the full amount required was provided by the State Government. From 1995-96 onwards, 50% of the funds are provided in the State Budget directly and the remaining 50% are to be collected from the Panchayats. This is likely to pose some problem and is under observation.

73rd Constitutional Amendment

In Andhra Pradesh, the responsibility of Rural Water Supply has been with the Gram Panchayats even before the 73rd Constitutional Amendment. Therefore, there will be no special implication of this amendment for the O&M system as far as Andhra Pradesh is concerned.

Strategy for Improved Maintenance System

a) For giving technical guidance to the maintenance systems of RWS Programmes (case studies made are annexed) exclusive staff should be made available.

b) The responsibility for the maintenance should be with the people only (through Gram Panchayats).

c) NGOs can be encouraged to take up maintenance of systems by creating awareness amongst the public and by realising required funds, so that the strain on Government funds is reduced and better maintenance can be achieved.

d) House service connections are to be encouraged wherever source is available and designs are to be made according to increasing per capita demand.

e) Stand by pumps and Motors to be kept invariably.

f) Element of contribution to be insisted upon for the provision of PWS Schemes so thatthe public feels more aware and involved in improving maintenance. Quality control checks to be streamlined.

PWS. Scheme, Kalyandurg : Maintained by the Gram Panchayats.

Sarpanch	-	B.Matehanna (Not available).
Exe. Officer	-	P. Sanjeeva Reddy.
Population	:	27,763 (1991) census)
PWS. Scheme sanctioned (Original)	-	1974
Augmentation sanctioned for 32.00 lakhs Subsequently	-	3 Stages pumping.
Source : (Original) = Open well + Bore well		
Augmentation	=	Infiltration well in Hagari River.
Length of Pumping main	-	18 KM.
G.L.S.R. 1) 40,000 gallons capacity. 2) 35,000 gallons capacity.		
Contribution by Panchayat & Public	=	Rs. 4.00 lakhs.
Public Taps	-	132
Private Taps	-	1120
Tap connection charges - (Original) - Capital.		
Ordinary	-	Rs. 116/- (Normally after 2 months).
Urgent	-	Rs. 1116/- (Immediate).
Recently panchayats revised the charges for 1996-97		
Ordinary	-	Rs. 116/-
Urgent	-	Rs. 2116/-
The maintenance Charges	-	Rs.300/-annum in advance Net income Rs.3.36 lakhs.
For Public Taps	-	20% on House Tax is levied and debited to the general Revenues.

It is observed through discussions that repairs are carried out within 12 hours, and the Panchayat is maintaining the facilities without breakdown.

Meters although provided are not used. On lumpsum charges are levied.

Net Income to Gram Panchayat	-	Rs. 18.00 lakhs.
Expenditure in administration	-	Rs. 8.00 lakhs
Street lighting expenditure	-	Rs. 2.00 lakhs.
Expenditure of development	-	Rs. 8.00 lakhs.

From the discussions with Executive Officer and others interesting things that come up as reasons for successful maintenance are:

There is good cooperation between Sarpanch & non officials with Executive officer and the other officials.

No interference by non officials.

Taps not allowed on pumping mains.

Before summer advance action taken for checking the sources and wherever necessary additional sources created.

Funds required for maintenance of PWS. Scheme are always provided by the Gram Panchayat on priority.

Tap connection (1/2") allowed in the Ist room of house instead of in open yards (front or rear) to reduce wastage of water.

42 Hand Pumps are available. Maintained by the Deptartment, they are utilised during power break downs and everybody stated that they are required as stand by's.

P.W.S. Scheme to Ibrahimpatnam

Scheme sanctioned in	:	1964-65
Scheme commissioned and handed over to Pachayat	:	1.10.1968
Source:		
Open well Augmentation	:	5 bore wells
1 bore well	:	recently
Sarpanch	:	P.Veerappa
E.O.	:	Ramamohan Rai
Mechanical Chargeman	:	Prathapa Reddy
O.H.S.R.	:	2 Nos. 50.000 gallons (2.50 lakhs Lr.) capacity.
Public Taps	:	106
Private House connections	:	1109 (16 Commercial Hotels etc.)
Monthly rate. Lumpsum	:	Rs. 10/- for domestic connections.
	:	Rs. 50/- for commercial purpose.
Capital donation for new connections	:	Rs. 500/-
1995-96 - Income Monthly usages	:	Rs. 1,06.075.00
Capital donations for connections	:	Rs. 50,800.00
		Rs. 1,56,875.00

1995-96 Expenditure

Salaries	:	Rs. 1,86,164.00
on Maintenance Bleaching	:	Rs. 9,240.00
Running	:	(73,860.00
Charges	:	(73,860.00
		2,69,264.00
		Rs. 2,69,264

Expenditure on Improvements

Pumpsets	:	Rs. 18,600
Pipeline extensions	:	Rs. 42,509
and taps etc.	:	Rs. 38,354
		Rs. 99,463
Total	:	Rs. 3,68,729
Income of panchayats	:	Rs. 19.67 lakhs.

Staff

1. Mechanical Chairman	:	1
2. Furnock cum Watechman	:	3
3. Watchman	:	2
4. Daily Labour	:	1

Points that come up after discussions:

Extra expenditure on water supply met from general Revenues.

Water quality is tested occasionally. Due to power break down- generators are a must for major schemes and are to be provided at 50% contribution.

Sarpanch has been requested to increase cost of capital/annual for service connections and also monthly charges.

Case study on maintenance of hand pumps

Maintenance of hand pumps in Sub Divn. I, Panchayati Raj Dept. Kalyandurg for the year 1995-96

Statistics

	Kalyandurg Mandal	Beluguppa Mandal	Total
Total Number of bore wells	324	214	538
No. of Bores condemned	30	13	43
No. of bores actually working	294	201	495

Total no. of Bore wells : 1020.

1.2 Frequency of repair. Once in six months (Average)

1.3 I Maximum time : 3 days.

II Mirimum Time : Less than 1 day.

1.4 Cost of Annual Maintenance of bore wells.

Salary of the staff.

		Salary	T.A.	total per Month	total per month
1.	Pump mechanic	3618.00	500.00	4118.00	49416.00
2.	Helper-I	1948.00	500.00	2448.00	29376.00
3.	Helper-II	2748.00	500.00	3248.00	38936.00
4.	Mobile Van Driver	2547.00	500.00	3047.00	36564.00
	Total			12861.00	154332.00

Total Establishment Charges per year : Rs. 1,54,332.00

1.5 Maintenance of Mobile Van (ATA 1052).

1.	Diesel	2205 ltr.	x	Rs.	8.30	Rs.	18,302.00
2.	E.Oil	78 "	x	Rs.	72.60	Rs.	5,662.00
3.	C. Oil	6 "	x	Rs.	63.00	Rs.	378.00
4.	B. Oil	13/4 "	x	Rs.	160.00	Rs.	280.00
5.	Grece	1 Kg.	x	Rs.	61.00	Rs.	61.00
6.	Waste	1 Pocket	x	Rs.	5.00	Rs.	5.00
7.	Distilled Water	2 Bottles	x	Rs.	5.00	Rs.	10.00
8.	Repairs to the van during 1995-96					Rs.	26,558.00
	total cost of maintenance of Mobile Van.					Rs.	51,256.00

Mobile van is attending to 3 Mandals-This Sub Divn. has 2 Mandals. hence 2/3 cost has to be booked for this Sub Divn.

(Since the Mobile Van was used for 3 Mandals 2/3 (51,256) Rs. 34,170.00

1.6 Cost of materials used for maintenance of hand pumps. 31,949.00

Total cost of maintenance for the year 1995-96 for 495 bore wells which are actually working 2,20,451.00

1.7 Cost of maintenance of one bore well:

2,20,451 ÷ 445.35 = 495 sum Rs/ 445/each bore well.

1.8 Reasons explained by the Dy. Executive Engineer (PR) for reducing the cost of maintenance against amount approved for note (Rs. 500/Pump.)

- Reduction of using spares by involving the peoples participation.

Wherever 'holes' are formed in G.I. Pipes that portion is cut and the balance portion is used by threading it and using a coupler instead of changing the entire pipe. The people have been made to bear the cost of coupler.

Replacement of Handles : Whenever handles are broken, they are being welded. Instead of changing them in the first instance itself, only after welding has been done at least 3 times are the handles changed..

Chains : Chains are reconditioned with community money and revising the same.

It is observed that there is good co-operation between staff and public and there are no complaints.

STATEMENT SHOWING THE LIST OF HAND PUMPS IN THE STATE AS ON 31.3.96

Sl. No.	Name of the District.	No. of Hand Pumps fixed.	Hand Pumps under Repairs.	No. of H.Ps working condition	No. of Pump Mech. working.	No. of Mobile Team	No. of H. Ps. condemned.
1.	Srikakulam	6019	159	5472	388	1	382
2.	Vizianagaram	6526	99	6084	43	2	343
3.	Visakhapatnam	8654	722	7307	42	2	625
4.	East Godavari	4111	152	3743	14	3	216
5.	West Godavari	2914	72	2645	29	2	197
6.	Krishna	5102	157	4801	25	5	144
7.	Guntur	8848	28	8077	65	2	743
8.	Prakasam	12993	164	11644	57	7	1185
9.	Nellore	9395	120	8523	43	6	752
10.	Chittoor	19259	542	17901	70	16	816
11.	Cuddapah	14965	254	13203	68	11	1508
12.	Ananthapur	15433	648	11597	1100	14	3152
13.	Kurnool	10528	859	8319	67	13	1350
14.	Mahabubnagar	14367	432	10944	73	13	2991
15.	Medak	10061	316	8687	35	4	1058
16.	Nizamabad	10318	371	9076	41	5	871
17.	Rangareddy	7767	372	6832	25	14	563
18.	nalgonda	13686	224	13176	133	4	286
19.	Warangal	11136	285	9741	47	6	1110
20.	Khammam	14073	906	12669	57	6	498
21.	Karimnagar	10135	427	9357	50	3	351
22.	Adilabad	10398	543	9225	38	2	630
	Total	**2,26,688**	**7888**	**1,99,023**	**1140**	**143**	**19777**

STATEMENT SHOWING DISTRICTWISE LIST OF P.W.S. SCHEMES

(Rs. in lakhs)

Sl. No.	Name of the District.	No. of PWS. Schemes.	No. of PWS. Schemes under Repairs.
1.	Srikakulam	221	35
2.	Vizianagaram	171	5
3.	Visakhapatnam	339	56
4.	East Godavari	534	8
5.	West Godavari	762	11
6.	Krishna	468	1
7.	Guntur	371	7
8.	Prakasam	311	6
9.	Nellore	670	1
10.	Chittoor	2006	71
11.	Cuddapah	989	27
12.	Ananthapur	1064	120
13.	Kurnool	739	72
14.	Mahabubnagar	1089	19
15.	Medak	1075	26
16.	Nizamabad	736	38
17.	Rangareddy	784	33
18.	Nalgonda	1114	8
19.	Warangal	630	21
20.	Khammam	375	4
21.	Karimnagar	621	41
22.	Adilabad	356	49
	Total	**15425**	**659**

Case studies made in respect of P.W.S. Schemes in Kalyandurg Sub Divn. Tadiparthi Sub Divn of Ananthpur District & Ibrahimpatham Sub Divn. of R.R. District.

1. **Mudiyallu - Kalyandurg**
Mandal Sarpanch : Smt. P. Sivarama
(she did not attend, but others attended).

Scheme sanctioned in	:	1987
Scheme commissioned	:	1989
Source : 150 mm bore well	:	250 deep
Pump	:	5 HP. Submersible Pump.
GLSR.	:	10,000 Gals, capacity. Yield of the bore well- About 110 LPM. (3/4 tank fills in 6 hours).
No. of Public Taps	:	13 Small sumps constructed with public contribution under 6 taps on ground level for the benefit of animals .
House connections	:	40
Water Supplied	:	6 AM - 9 AM., 4.30 PM. - 6 PM.
Power availability	:	10 AM - 4 PM. = 6 hours. 11 AM- 5 PM. = 5 hours. 11 hours.
Maintained by	:	Gram Panchayat.

From the study and discussions made with the public,thefollowing points have emerged:

The scheme has beenworking without a break since 1989. Only servicing of Pump and Motor was undertaken during 1995-96 at a cost of Rs. 2,500/- There are no other major expenditures. The pump operator is paid Rs. 300/- a month. Facilities are also provided for drinking water to animals ;

Income of Panchayats: The Panchayat income out of taxes is very low and only Rs. 1800/- wascollected recently. There is no systematic taxation.

Charges for House connections

a) No capital amounts are insisted upon for house connections.

b) For drawal of water, a lumpsum rate of Rs. 120/- annum is fixed-without any meters.

c) Only few people paid.

d) Recently the Panchayats passed a resolution. Fixed capital connection charges as Rs. 1116/- per connection.

Other facilities

3 Hand Pumps are available. People use them during power breaks and stated that they are required.

2. **P.W.S. Schemes at Borampalle**

Sarpanch	:	Mahalakshamma (Not available)
Vice President	:	Ramanjaneyulu
Population	:	1400
Source of funds	:	Sri Satya Sai Project
Public taps provided	:	6
Source	:	Bore well
OHSR.	:	60,00 (10 mtrs. staging)
Public Taps provided	:	3+3
Public Taps under construction	:	2 8
Water supplied	:	5.00 AM - 9.00 AM 4.00 PM - 7.00 PM
Part time pump mechanic	:	Rs. 600/- month.
Public are getting good water	:	scheme is being run since 1.8.95 by S. S.S.P. Authorities.

3. **CPWS. Schemes to Vanganut & 6 other villages**

The Scheme consists of drawing water for drinking water in Penna River in two zones.

Zone - I: Provides water to Bandala Dinne, Vanganur, Kondepalli with extension to Konavaripalli

Zone - II : Provides water to Akkannapalli, Challavaripalli and jambutapalli (Sketch enclosed).

Discussed with Sarpanch and villagers of Bondaladinne. The details are as follows:

Observations

Water has not been pumped to Konavaripalli which was subsequently added.

Scheme commissioned in 1983 and working since then. Scheme maintained by the PRED.

There was a major break down (pump burning) during 1995-96, and water was not supplied for 3 days. Other than this except for power break downs water is normally available for 8 to 9 hours per day.

Due to standby pumpsets continuity is maintained.
No financial support from Panchayats and people.
Many persons in Bondaladinne have individual wells amd pumps near by.

Staff maintained

1.	Watchman cum Pump Operators	:	2
2.	(N.M.Rs.) Labourers	:	4
3.	Fitter	:	1

Annual Expenditure

(Rupees)

S.No.	Year	Amount	Expenditure
1.	1994-95	89,000	72.321
2.	1995-96	40,000	1,46,561
3.	1950-96	—	49,217

Proposals sent for enchancement of maintenance grant to Rs. 2.00 lakhs.

Details of PWS in Zone I & II

Sl. No.	Name of villages	Population covered.	Pipes Used.	Length of Pumping mains & pipes unsed	Storage Capacity provided.	Source	Remarks.
ZONE-I							
1.	Bondaladinne	815	110 mm 9 PVC	1000 Mtrs.	20,000 ltrs. GLSR.	3-10 Mts. dia. I-W 6 Mtrs deep in Peena River	2 Nos. of 5 HP Pump sets are used.
2.	Vanganur	798	- do -	32 00 Mtrs.	20,000 ltrs GLSR.		
3.	Kondepalli (T) Kondepalli (V)	585	- do -	2000 Mtrs.	10,000 ltrs. Sump.		
4.	Konavaripalli						
ZONE - II							
1.	Akkannapalli	236	90 mm PVC.	1000 Mtrs.	10,000 Ltrs. GLSR.	3.00 Mtrs. dia I.W. in Penna River.	2 Nos. of 3 H.P. Pumpsets used.
2.	Challavaripalli	383	- do -	4000 Mtrs.	10,000 Ltrs. GLSR.		
3.	Jammalapadu	260	- do -	2000 Mtrs.	10,000 Ltrs.		

1.0 Handpumps Maintenance in Ibrahimpatnam Sub divn. R.R. District,consisting of 3 Mandals, Yacharam, Manchala, Ibrahimatnam.

1995-96

2.1 Statistics

No. of Hand Pumps	:	790
Mobile team	:	1
Staff	:	3 Pump Mechanics
	:	1 Helper
	:	1 Driver

2.2 Average Number of repairs carried out : 4 to 5 days.

2.3 Time taken for repairs

a) Emergency case where there are no other means of water supply : 24 hrs.

b) Maximum period of repairs. - 3 days.

2.4 Type of repairs : Mostly pipes resting and formation of holes and replacement.

Average 1 to 1 1/2 years for pipe handles-change once in 2 years.

2.5 Frequency of repairs - Once in 6 months.

2.6 Remarks.- It was explained that a better job can be done by a team (Mobile Team) than with a single hand pump mechanic due to non availability of labor in villages. When they attend and transportation are problems.

3.0 Final Observations on Field Visits

3.1 Individual PWS Schemes.

Where Panchayats have taken interest, the maintenance of PWS Schemes is satisfactory.

Where Department personnel are taking interest and assisting the Panchayats, PWS. Schemes are running well.

Where House service connections are given and monthly charges are collected the schemes are working satisfactorily without many financial problems.

There is a need for enhancing charges for house service connections.

3.2 Comprehensive/Regional Scheme

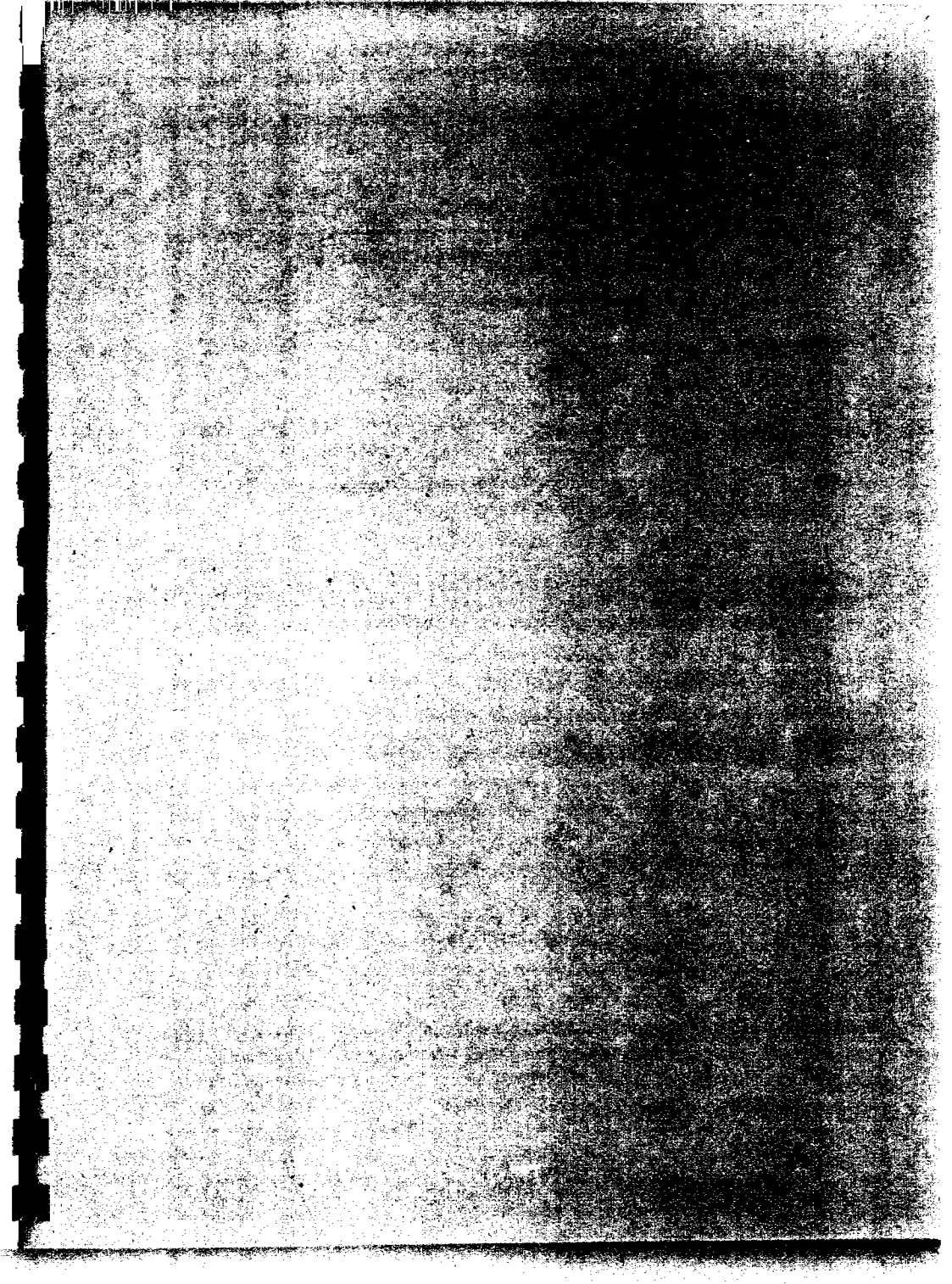
The involvement of the community is absent and the Schemes are maintained by the department. Maintenance is unsatisfactory.

Before transferring the Scheme to the community, it should be tried on an experimental basis.

Better procedures for quality control maintenance need to be followed.

COST OF MATERIALS USED FOR MAINTENANCE OF HAND PUMPS 4/95 TO 3/96

1.	G.I.Pipes	32 Nosx 250	8,000.00
2.	Plunger rods	32 Nosx 80	2,560.00
3.	Cylinders	-- X 685	--
4.	Barrels	3 Nosx 271	813.00
5.	Pedastals	1 Nosx 795	795.00
6.	Water Tanks	3 Nosx 795	1116.00
7.	Heads	4 Nosx 625	2500.00
8.	Handles	10 Nosx 640	6400.00
9.	Axels	10 Nosx 70	700.00
10.	Bearings	2 Nosx 90	180.00
11.	Chains	45 Nosx 75	3,375.00
12.	Upper Valve Guide	23 Nosx 19	437.00
13.	Lowest Valve Guide	10 Nosx 23.50	234.00
14.	Reducer Caps	4 Nosx 38.65	154.00
15.	N.S. Buckets	250 Nosx 5.24	1,312.00
16.	Rod Couplings	8 Nosx 10	80.00
17.	Upper Valve Assembly	1 Nosx 10	80.00
18.	Lower Valve Assembly	2 Nosx 81	162.00
19.	Sheet Rubbing 40 x 40	20 Nosx 2.25	45.00
20.	Bolts & Nuts	50 Kgsx 45/Kg	2,250.00
21.	G.I. couplings	7 Nosx 10	70.00
22.	Third Plate	3 Nosx 55	165.00
23.	3/8 Bolts Nuts.	20 Nosx 3	60.00
24.	Sparers	10 Nosx 37	370.00
		Total	Rs. 31,949.00



NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi

O&M of Rural Water Supply Systems In Karnataka

R. Kondala Rao

1.0 **Drinking water in Karnataka State is provided under the following categories**

a) Bore wells fitted with hand pumps

b) Mini water Supply Schemes - (By direct pumping to cisterns)

c) Piped water supply schemes - (With distribution net work).

2.0 Administrative Set Up

2.1.0 **Administrative Wing :** The Department of Rural Development & Panchayat Raj looks after RWS Schemes in the State. A Minister is incharge of the subject. There is one Principal Secretary & One Secretary II heading the department at the Secretariat level.

The three tier system of Panchayat Raj is in existence.

a) Zilla Panchayat at district level headed by a Chief Executive Officer (official side).

b) Taluq Panchayat at Taluq level headed by Taluq Executive Office (official side).

c) Village Panchayat at Village level headed by the Secretary to Panchayat (official side).

Elected Presidents head all the institutions.

2.1.1 **Powers of Administrative Sanction :**

Zps - Up to Rs. 10.00 lakhs

Govt.- Above Rs. 10.00 lakhs

2.1.2 **Action Plans**

ZPs - Approve works costing up to Rs. 1.00 lakhs

Govt.- Works costing above Rs. 1.00 lakhs after scrutiny by ENC.

2.2 **Technical Wing**

2.2.1 There is an Engineer- in- Chief incharge of Rural Water Supply & Sanitation Sector. There are SEs (HP) below him for Rural Water Supply Schemes.

2.2.2 At the Zilla Panchayat level, there will be2 or 3 Executive Engineers attending to all Rural Development works on 'Area Jurisdiction' basis. There will be AEEs (Sub-division) below the EE at Taluq level with 3 to 4 AEs (Graduate Engineers) and 2 to 4 JEs (Diploma Holders). An AE/JE will be in charge of one or two 'Hoblis' (equivalent to a Revenue Firka 3 to 4 Hobis for 3 Taluq).

2.2.3 **Technical Sanction Powers:**

Executive Engineer upto	Rs. 4.00 lakhs
Superintending above	Rs. 4.00 lakhs
Engineer Upto	Rs. 20.00 lakhs
Engineer-in-chief Avove	Rs. 20.00 lakhs

3.0 There are 9,920 Mini PWS Schemes and 10,059 PWs Schemes (Total 19,979) and about 1.43 lakhs bore wells fitted with hand pumps.

4.0 Operation of Maintenance of B.W.

Programme

Although the Act provides that the Panchayat is responsible for maintenance of hand pumps, the hand pumps maintenance is continuing with the Government (Dept.) only. Government/ Zilla Panchayat provides funds for maintenance of hand pumps out of allocations made under State Plan (NNP) only. An amount of Rs. 400/- is provided per annum.

4.1 2 Tier system of maintenance is followed.

a) **First tier :** A voluntary care taker at the village level. Residing near the hand pumps, the voluntray caretaker takes care of the pump and educates the public about proper use of the pumps and how to keep the environment clean.

b) **Second tier :** A mobile team at the Taluq level with crew of 5 members. The team normally caters to 500 pumps. The crew members attend repairs immediately after the complaint is received. There are 350 mobile teams working at present for 1.43 lakhs bore wells.

4.2 Training and quality control

Care takers are being trained in the state in all the districts. The caretakers work voluntarily and are trained for two days in order to equip them to maintain the hand pumps above ground level. The selected caretaker should be in the age group of 18 to 35, should be a user of the pump, should be literate and should have an independent means of support. During the training programme caretakers are provided with two double hand spanners, pre-stamped post cards to report the break down, small quantity of grease and necessary Information Education Communication (IEC) materials.

In order to achieve effective maintenance of hand pumps, un-employed educated youth are selected in Mysore district and are trained vigorously for 15 days to make them capable of handling break down of hand pumps independently. The trained mechanics have been provided with tool kits by UNICEF, and have been placed at the Panchayat level. The programme may be extended to other districts.

For documentation and proper efficiency of maintenance KORDEX system has been taken up in six districts, namely Mysore, Belgium, Tumkur, Raichur, Bellary and Dharwad. Newly designed village level operating and maintenance pump (VLOM) , also called India Mark-III hand pump are being installed with the help of UNICEF, which is providing assistance with conversion kits and special tools.

To ensure the quality standards of hand pumps received from the supplier and also to ensure that quality spare parts are used during repairs, training programmes have been conducted with UNICEF assistance for suppliers.

5.0 O & M of PWS Schemes

5.1 The Mini PWS Schemes & PWS Schemes after construction are maintained by the Panchayats only. Government/ZP is however providing some funds to them for maintenance. Funds are provided at the rate of Rs. 1600/ Scheme in respect of Mini Water Supply Schemes and @ Rs. 3500/ Scheme for PWS Schemes.

5.2 Technical support is given by the ZP Engineering Wing to the Panchayats. However, whenever major break downs occur, the ZP Engineering Wing attends to the restoration out of funds provided by the Zilla Panchayats. It is generally observed that these funds are not sufficient and the extra expenditure is met out of other grants.

5.3 The allocation made and expenditure incurred during last the 3 years on the RWS Schemes is indicated below :

	1993-94		1994-95		1995-96	
	Grants	Expen-diture	Grants	Expen-diture	Grants	Expen-diture
1. Maintenance of bore wells	500.50	804.30	447.89	853.76	517.62	1117.62
2. Maintenance of MWSS	200.00	211.21	250.00	248.69	270.00	371.94
3. Maintenance of PWSS	400.00	383.73	430.00	477.66	450.00	611.94

From the above statement it is clear that the funds provided are not sufficient and extra expenditure is borne from other sources.

6.0 Performance of O & M Systems

90% of the hand pumps are working as per details furnished by the State Government (Annexure-I)

7.0 Community Participation and Gender Aspects

Integration of the community with the rural water supply project right from the planning stage is considered a must as per the latest guidelines issued by the Government of India.

Women will be made to play a prominent role in selection of sites for bore wells as well as maintenance as they are the main users and beneficiaries of these schemes. Local initiative in maintenance is yet to come up to expectations. The people are not willing to contribute any amount towards maintenance of hand pumps.

However PWS/MPWS Schemes are maintained by Panchayats and expenditure over and above the funds released by the Government /ZPs are met by them. Thus, it is only the participation of the community which is very limited.

7.1 Constraints affecting performance

(i) Paucity of funds for management
(ii) Institutional weakness
(iii) Lack of trained man-power at all levels
(iv) Low income level of the villagers
(v) Lack of appropriate financial policies to collect user charges
(vi) Ineffective cost recovery system
(vii) Lack of Health Education and community participation and
(viii) Poor O&M
(ix) Power break downs
(x) Local interference due to political changes
(xi) Non-existence/functioning of many real water committees in schemes.

8.0 73rd Constitutional Amendment

Implications

In Karnataka the Zilla Parishads and Mandal Parishads which were in existence before the Amendment are continuing to function. Now, however, village Panchayats have also entered the scene (3 tier) thereby reducing the jurisdiction of lowest PR Body to village level. There is no other change in operations.

9.0 Innovative Experiences & Strategy for Improved Maintenance Systems

- Quality Control Checks on materials to be improved.
- Ground Water Legislation to be brought up.
- Stand by pumps to be provided at Hobli level for PWS/MPWS Schemes for quick replacement before repairs are carried out to regular Motors & Pumps.
- Training to be given to mechanics selected from the villages at Hobli level.
- In major schemes stand by generators to be provided to the Panchayats on subsidised costs basis as power break downs are common in summer.

10.0 Case Studies were Prepared on the following Aspects

a) Visit and study of PWS Schemes to villages (Annexure-II)

b) Position of maintenance of bore wells with hand pumps etc. in 2 divisions and one Taluq (Doddaballapur) (Annexure-III).

ANNEXURE - I

STATEMENT SHOWING THE POSITION OF HAND PUMPS MAINTENANCE DURING 5/1996 IN KARNATAKA STATE

Sl. No.	Name of the District	Position since inception Borewells dug		Borewell fitted with hand-pumps	Borewells with hand-pumps working at the beginning of the work	Hand pump under repair Beginning of the month	During the month	Total	Pumps repaired during the month	Balance to be required
1.	Bangalore Rural	9555	8192	8153	7781	372	--	372	--	372
2.	Bangalore City	4861	4443	4368	4342	26	--	26	--	26
3.	Kolar	10116	8791	8742	8699	43	--	43	--	43
4.	Tunkur	12294	11107	11021	10861	160	544	704	603	101
5.	Chitradurga	9011	8023	8013	7805	208	626	834	619	215
6.	Shinoga	8401	7354	7347	7250	97	996	1093	952	141
7.	Chikmagulur	6464	5563	5365	5273	92	264	356	293	63
8.	Mysore	14441	10295	10245	9984	261	1152	1413	1174	233
9.	Mandya	7494	6618	6547	6102	445	876	1321	825	496
10.	Hassan	11143	9605	9560	9437	123	712	835	716	119
11.	South Karwar (Kannada)	9452	8003	7981	7845	136	296	432	259	173
12.	Kurgu	3648	3029	3021	2963	58	--	58	--	58
13.	Belgaum	9685	8440	8416	8310	106	1205	1311	1217	94
14.	Dharwad	8945	8092	8054	8033	21	150	171	126	45
15.	North Karwar (Kannada)	5830	5040	5020	4992	28	223	251	215	36
16.	Bijapur	8293	6971	6953	6788	165	519	684	657	27
17.	Gulbarga	9458	8158	8107	7916	191	--	191	--	191
18.	Bidar	4577	3502	3486	3437	49	582	631	587	44
19.	Raichur	8280	7068	7025	6609	416	650	1066	646	420
20.	Bellary	6704	5679	5646	5643	03	292	295	291	4
	Total	168657	143070	140070	3000	9087	12087	9180	2907	

ANNEXURE - II

PWS Scheme to Banamdur

Panchayat	:	Bididi
Sarpanch	:	Chandrasekhar
Population	:	2176
House	:	350
Source	:	Bore well - 150 mm dia
Yield	:	10,000 GPH
OHSR	:	50,000 Litre.
Public Taps	:	27
House Service Connections	:	45

The Panchayat is maintaining the scheme

For House Service connections Rs. 350/- is charged by the Panchayat as deposit. Monthly maintenance rate for House service connection is Rs. 10/- (no meters/lumpsum). Monthly collection on Public Taps is Rs. 3.00/House/Month.

Income on water connections		:	Private 45x10x12=5400-00
Supply Rents & Taxes	Public Taps	:	350x312=10980-00
	Total per mensum	:	16380-00

Expenditure

Waterman - 1 @ Rs. 200/- per month	:	Rs. 2,400.00
Electricity Rs. 1500/- per month	:	Rs. 18,000.00
Repairs Rs. 500/- per month	:	Rs. 6,000.00
		Rs. 26,400.00

Hence, theincome derived on Water Supply is not sufficient to meet maintenance charges. Extra expenditure is met from other sources.

Power Supply

Till 1-7-96	:	Once in 2 to 3 days
Now	:	No break down

There are 8 HPs working (Out of 9) in the village and people use them at the time of power break downs, etc.

ANNEXURE - II (Contd.....)

PWS Scheme at Bashethipally : maintained by the Panchayat

Date of visit	:	16.7.1996
Population	:	2105 (1991 census)

Current estimates, taking rapid growth into account, place the population at 5000.

There are 11 habitations in the Panchayat.

Time of Completion	:	2/1996
Scheme under which Sanctioned	:	ARWS
Estimated amount	:	Rs. 3.60 Lakhs
Source	:	Bore well - 150 mm-300 deep
Pump	:	5 HP Capable of drinking 4000 GPH.
Capacity of OHSR	:	50,000 Letters
Number of Public Taps	:	15 +3 (under addition)
House service connections	:	Nil for new scheme. For old mini scheme, house service conductions unauthorised mostly available.
Times of distribution	:	6 AM to 11 AM 3 PM to 6 PM
Power availability	:	Regular Summer 3 to 4 hours break.
Proposals of the Panchayat to improve finances for proper maintenance	:	House service Connection Rs. 2000/- capital amount.
Monthly Tariff	:	Rs. 20/- per house. Rs. 10/- per SC/ST house.
Annual income of Panchayat	:	Rs. 4.00 lakhs

Expenditure

		Rupees per annum
Power charge Rs. 1500/- per month	:	18,000-00
Operator Rs. 400/- per month	:	4,800-00
Other repairs	:	1,200-00
Total expenditure per annum	:	24,000-00

- An old mini PWS Scheme is working with direct pumping.
- The Panchayat proposes to abandon the old scheme but use that source also by connecting it to the present OHSR to distribute water through the distribution net work.

- There are two hand pumps in the village.
- One hand pump is under repair.
- Elected body is not available & a special office is functioning instead.
- Active leaders of the villages are taking part in the proposals and O & M of RWS Scheme.

Officers with whom the author interacted in Karnataka State

1 Sri Satyawadi, IAS, Principal Secretary, RD & PR.
2 Sri. M.R. Srinivasa Murthy, Secretary II, RD & PR.
3. Sri S. Ramadas, Engineer-in-Chief, I/C
4. Sri Vijaya Kumar, SE (Pr), World Bank Projects
5. Sri B.S. Viswanath, SE (Designs)
6. Sri March Reddy, SE (Training & Monitoring)
7. Sri M.L. Madaiah, EE ( )Bangalore Rural
8. Sri Prakash Kumar, AEE ( )
9. Sri Mallikarjuna, AE.,
10. Sri Surendra, TA, monitoring

ANNEXURE - III

Maintenance of Hand Pumps in Doddabellapur Taluk, Bangalore Rural District, Karnataka State During 1995-96

The Zilla Panchayat Engineering Sub-division is maintaining the hand pumps in Doddabellapur Taluk. There are a total of 1272 hand pumps working in Doddabellapur Taluk. The rural people depend mainlyon hand pumps for their water requirement. In summer cattle & bullocks etc., also depend solely on bore well water . Hence, during summer the utility of a hand pump fitted to a bore well is greater. Care is taken to repair the hand pump as soon as complaints are received. Repairs are attended to within 2 or 3 days. In Doddabellapur taluk 2 mobile units are being used to handle repairs.In summer when there is acute shortage of water, one additional mobile unit is used to take care of repairs.

The hand pump goes out of order very frequently because of lack of awareness, illiteracy and inadequate familiarity of users with the operation method. The complaints can be reduced gradually by educating the users/ beneficiaries.

The cost incurred for maintaining one borewell during (1995-96) in Doddabellapur taluk works out to Rs. 682/ per bore well while the cost for entire Bangalore Rural Division works out to Rs. 620/- bore well /year.

Expenditure incurred on Maintenance of Hand Pumps in Doddabellapur Taluk during 1995-96 Bangalorerural District, Karnataka State.

Total number of bore wells sunk	:	1352 Nos.
Number of bore wells failed & dwindled (defunct)	:	80 Nos.
Number of hand pumps actually working	:	1272 Nos.
Total number of Hand pumps repaired during the year (1995-96)	:	1872 Nos.

Time taken for attending the repairs to hand pump is within 4 days from the date of receipt of the complaint.

Total Expenditure incurred for maintenance of hand pumps during (1995-96).

I.	Salary of the repair staff 8 Mechanics @ 41.60 per day 365 days	:	1,21,472/-
II.	Cost of Diesel utilised for Mobile Van 9000 Litres @ 8.10	:	72,900/-
III.	Cost of spares used for maintenance	:	6,72,334/-
	Total	:	Rs. 8,66,706/-

Total number of hand pumps working : 1272 Nos.

Total expenditure incurred during (1995-96) : 8,66,706/-

Cost per bore well works out to : 681-37

say Rs. 682/-

For the Division (Bangalore Rural)

Total Number of bore wells fitted with hand pump in division Jurisdiction is : 3760 Nos.

Total expenditure for maintenance during (1995-96) : 23,28,000/-

Maintenance cost per bore well works out to : Rs. 620/-

ANNEXURE - IV

Report on Water supply scheme maintenance in Ramanagar Division

Ramanagaram Division comprises of four Taluks viz., Ramanagaram, Channapatna, Kanakapura and Magady. In these four Taluk, 6077 bore wells with hand pump have been fixed and 190f Piped Water Supply Schemes, 452 Mini Water Supply Schemes have already commissioned and are working satisfactorily. The Taluk wise details are as follows :

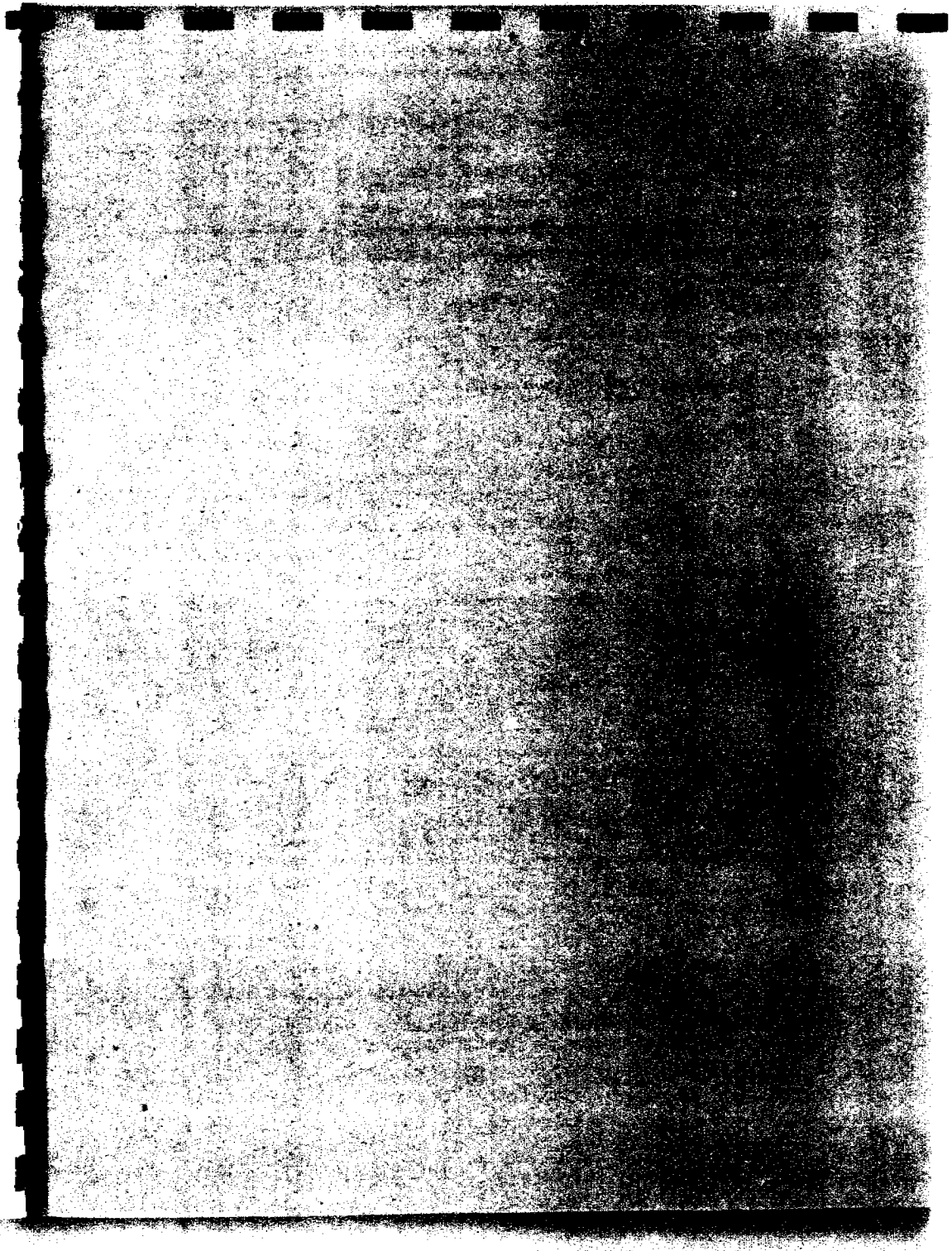
Sl. No.	Description	Ramanagaram	Channapatna	Kanakapura	Magady	Total
1.	No. of Gram Panchayats	24	32	43	32	131
2.	Area in Sq. Kms	625	535	1603	797	3560
3.	Population	2,05,326	2,38,060	3,14,360	1,93,043	9,50,789
4.	No. of bore wells with hand pumps	1216	1399	1972	1490	6077
5.	Piped Water Supply Scheme (in Nos.)	36	63	54	37	190
6.	No. of Mini Water Supply Scheme	98	80	179	95	452

Maintenance grant allocated during 1996-97 for the division

		Total	Amount in Rs.	Average Rate
a)	Bore Well	6077	23.81 Lakhs	Rs. 391/handpump/year
b)	Mini Water Supply Scheme	452	20.00 lakhs	4424/Schemes/Year
c)	PWS Schemes	190	20.00 Lakhs	10,572/Schemes/year

As per Government Circular, for bore wells with hand pump fixed, the maintenance cost is Rs. 400/- per bore well and this allocated amount is not sufficient to carry out hand pump repairs efficiently since the cost of materials, labour and consumables is more. The Gram Panchayats have expressedg their inability to maintain the hand pump in their areas. Therefore, at present, as per directions of the Zilla Panchayat, the hand pump repairs are taken up by the Zilla Panchayat Engineering divisions.

In Mini Water Supply Schemes and piped water supply schemes the maintenance grant provided is Rs. 4,000/- and Rs. 6,000/- per annum and this amount is found to be insufficient.



NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi

O&M of Rural Water Supply System – Related Issues & Problems

Gurdip Singh

1. There is a growing threat to water quality and the sustainability of water sources. Within this overall context, the key issues affecting O&M are :

   i. Mismatched planning & design approach.
   ii. Deficient system implementation.
   iii. Lack of proper documentation of the system laid.
   iv. Mismanagement of O&M services.
   v. Lack of community participation.
   vi. Lack of cost recovery.
   vii. Inadequate and inappropriate funding of the system.
   viii. No legislation to regulate O&M services.
   ix. Political Interference.

2. Mismatched Planning & Design Approach

2.1 Any system which is not properly planned and designed is bound to malfunction.

2.2 There are also instances where an unsound technology or unsuitable equipment or both have been thrust on the water authority — with unfortunate consequinces for O&M.

2.3 Lack of meaningful interaction between the system designers and the ground operators is bound to hamper O&M. Moreover, stringent procedures do not allow system designers to introduce corrective measures based on feedback from the ground operators.

2.4 Similarly any system, if not correctly laid or tested hydraulically or not well documented, is obviously bound to aggravate the O&M problems.

3. Mismanagement of O&M System

3.1 Any system, irrespective of how precisely it has been executed, is bound to perform poorly if not meticulously managed.

3.2 O&M, normally graded as inferior to capital construction, rarely attracts talented supervisory staff — a factor which resuts in poor performance.Besides, political interference often results in the appointment of unsuitable staff for O&M.

3.3 Unreliable water supply due to erratic electric power availability is another index of mismanagement.

3.4 Lack of monitoring of the system's operational efficiency results in unaccounted per capita water supply.This issue of accountability is further compunded in the current situation where:

a. the water authority tends to mechanically with little concern for the percentage pick up of water by the community and

b. the community itself is as little concerned whether the water pours into pitcher or flows waste into a stagnant waste water pond.

Such a situation results in:

i. financial drainage

ii. cummulative resource depletion

iii. environmental degradation through a proliferation of waste water ponds. Such ponds also pose a health hazard and run counter to the pursuit of health promotion through a supply of clean water.

Similarly the system performance efficiency i.e. water quality control, is normally not adequate, which is a must for two important reasons, viz,to instill confidence in the community to accept and own the system, and to curb contamination of water and render it of an assured quality.

4. Significance of Community Participation

4.1 The significance of community participation in the planning, laying and satisfactory functioning O&M of a drinking water facility is well known. Despite the best inputs by the Water Authority, a water supply system can never be satisfactory till the community owns the system and ensures its sustainability.

4.2 Broadly, the action plan to achieve the above objective can encompass the following:

4.2.1 Promotion of community awareness about the importance of safe drinking water, and the various diseases resulting from use of unsafe water.

4.2.2 The community must be involved in making various decisions right from the project planning to its implementation and subsequent maintenance.

4.2.3 The community must be apprised of the one time capital cost input to set up a system, the recurring annual financial liability for satisfactory maintenance. Views/ suggestions and ultimately, participation from the community must be sought on the subject of mobilisisation of finances to meet the capital and recurring liability.

4.2.4 Steps should be taken to inspire in the community a feeling of ownership of the water supply system. This would help in ensuring a waste free, safe, optimally economical and self-sustainable system.

4.2.5 The importance of proper disposal of waste water which may promote a higher disease incidence should be impressed upon the community.

4.2.6 It would be necessary to constitute a village level committee and entrust it with the tasks of:

a. management of the system on completion and

b. the collection of water cess.

5. Cost Recovery

Lack of accountability and coordination amongst the government agencies supplying water,coupled with lack of awareness and the consequent absence of community participation, contribute to making cost recovery a difficult task.

6. Lack of Legislation to Regulate O&M Service

There is a complete lack of service legislation for O & M, on the lines, for instance, of a Municipal Act, an Electricity Act, or a Canal Act etc.. An Act empowered to deal with vandalism, an effort to break or damage any segment of the system network, pilferage of service, equipment or use of any mechanical or electrical appliance to draw unauthorised supply of waste from the system network would go a long way towards regulating O & M services.

7. Accountability Sans Power to Punish

Any management, if not empowered to axe an ailing arm is sure to end up in a mess. In this context, amply enacted codal provisions fully empowering the ground operators to take action on any act of indiscipline or dereliction of duty are necessary.

8. System Transparency

Transparency in the O&M system management has to be absolute if community participation is to be achieved.

9. Political Interference

Political inteference at times thrusts on the water authority an unsound technology, procurement of inappropriate equipment and materials. Often, ill trained and incompetent staff are assigned to O & M management. All this combines to degrade and ultimately destroy the O&M system.

10. Ground Impact Evaluation of these Issues on O&M

10.1 A Case Study of the following water supply systems has been made to evaluate the impact of the above listed issues on O&M.

10.1.1 Providing Water Supply Scheme (Canal based) to Dayyar Group of two No. villages and subsequently extension to other village i.e. Jogiwala Teh. Fatebad, Distt. Hisar (Haryana).

10.1.2 Providing Water Supply Scheme (Tube Well) to Jawaharpur group of 34 No. village and subsequent trifurcation of the same, block Dera-Bassi, Distt Patiala (Punjab).

10.1.3 Providing lift water supply scheme (Spring based) to village Gharog-Gandhal in gram Panchayat Nehra and Sherkarh Distt. Shimla (Himachal Pradesh).

10.2 Observed Impact

10.2.1 **Dayyar group of villages, Distt. Hisar (Haryana)**

The canal based scheme was commissioned in 1981 two villages, namely Dayyar (pop. 1769-1971) and Ramsara (pop. 1856-1971).

The water works was located in Dayyar due to its proximity to the canal water source, availability of sufficient land for any subsequent system augmentation.

10.2.2 The supply of water to village Ramsara was to be through a rising main comprising of 6"x8000 Rft and 4"x7000 Rft with the following designed assumptions:

(i) Pipe Network designed for 2 times the average daily demand.

(ii) Pump sets designed for 8 hours working a day.

(iii) Minimum terminal pressure at village head as 28 ft.

10.2.3 During 1984-85, water supply was extended to another village i.e. Jogiwala (pop. 1450-1971) by augmenting the treatment units at water works Dayyar and by laying 6"x8000 Rft 4"x8200 Rft. at an estimated cost of Rs. 9.50 lakhs.

10.2.4 Subsequently during March, 1990 another estimate was prepared to provide an independent water works for the village Jogiwala (Estimate cost 16.82 lakhs) with the pipe network designed with P.F. 2 and the pump working as 8 hours a day. Grounds necessitating this estimate were:

i) Inadequate water supply in the village

ii) Inadequate terminal head in the village

iii) Long length of the connecting Rising main i.e. 6"x8200 RFT and 4"x8200 Rft. (Work against this estimate is nearing completion.)

10.2.5 Thereafter another estimate (14.50 lacs - March, 1991) was prepared for construction of an independent water works at village Ramsara with pipe network designed for P.F. 2.5 and pump operation of 8 hours a day. Grounds necessitating this estimate are:

i) Damage to the connecting rising main between village Dayyar and Ramsara.

ii) Unauthorised tapping of the rising main.

iii) Reduced available terminal head of 10.84 ft. against the designed head of 28 ft.

10.3 Case Study Observations

10.3.1 The initially extended water supply to village Jogiwala from water works Dayyar being inadequate and of reduced terminal pressure, the grounds for a subsequent independent water works at village Jogiwala, were logical. This case points out the erratic planning and system operation which necessitated the change.

10.4 Grounds of System Failure

10.4.1 The system failure thus could be safely attributed to :

i) Reduced terminal head due to higher flow causing higher friction losses in pipe net work.

ii) Reduced per capita supply due to curtailed pumping hours, as below

a) Daily water requirement of village Jogiwala = 30500 gallons/day.

b) Total daily supply at two hours pumping a day (30% of requirement) = 10800 gallons

(c) Terminal Pressure in the pipe network at the village = 19.50 feet as against a minimum designed head of 28 feet.

The system thus failed both on per capita supply and terminal pressure. But under political pressure, suggestions for an independent water works at village Jogiwala was not accepted and a sub-water works constructed at Jogiwala.

10.5 Similarly there was no documentation of the system laid i.e. no field book of the pipe line laid had been maintained.

10.6 There was a complete lack of community participation right from planning andimplementation to the functioning of the facility. Nor was there any cost recovery of the service rendered. This resulted in total lack of accountability,besides escalating O&M cost.

10.7 Further, a large number of public hydrants being without water taps (as shown in the table), resulted in avoidable waste flows :

Sr. No.	Village	Sanctioned standposts	Unauthorised standposts	Total standposts	No. of standposts without taps
i.	Dayyar	33	4	37	22
ii	Ramsara	27	3	30	22
iii.	Jogiwala	36	14	50	24
	Total			117	88

i.e. 75% of water hydrants were without taps.

10.8 Similarly construction of an independent water works at village Ramsara was due to :

i) Failure of the system planning and erratic implementation.

ii) Lack of regulations to deal with unauthorized tapping.

iii) Undue public and political interference.

10.8.1 Planning Failure

i) Estimated daily water requirements = 32800 gallons.

ii) Pipeline designed for a daily flow = 65700 gallons.

iii) Designed capacity of the pump = 8000 gph.

iv) Capacity of the pump actually installed = 11880 gph. at 984 feet

v) Length of the rising main = 6"x8000 ft. and 5"x7000 ft.

vi) Head loss in system = 111.80 feet

vii) Actual terminal pressure at village head is zero against the estimated head of 28.0 and per capita supply = 29 lpcd.

10.9 The system failure was partial on per capita supply but it was a complete collapse on terminal pressure. As a result, the demand for an independent water works was conceded instead of resorting to rectification of the failing parameters.

- For the requisite improvement, if bifurcation or trifurcation would have been the right recourse, there was hardly any justification for the Water Authority to split the supply schedule in two zones within the same village having an independent works. This perforced regulation was thus due to reduced per capita supply in consequence to reduced power availability.

- **Observed Ground Status**

Per capita supply and terminal pressure, both designed and actually observed is detailed below:

Sr. No.	Name of village	Per Capita Designed rate	Supply Observed level	Terminal Pressure
1.	Dayyar	70 LPCD	70 LPCD	negative pressure with supply at pump installed rate.
2.	Ramsara	70 LPCD	22.75 LPCD	11.5" against.
3.	Jogimala	45 LPCD	22.75 LPCD	negative pressure with supply at pump installed rate.

10.10 Case Study Observation

As obvious from the account above it has not been possible to achieve the desired goal of having the designed per capita supply at appropriate pressure. The futile effort has resulted in additional capital and recurring O&M cost.

Sr. No.	Capital	Capital cost (in lakhs)	Annual recurring O & M cost (in lacs)
1.	Combined w/work at Dayyar	62.90	7.71
2.	Waterworks for village Dayyar only	—	5.25
3.	Waterworks for village Ramsara only	32.64	4.14
4.	Waterworks for village Jogiwala only	34.25	3.38

10.11 Other Lack of Provisions Affecting O&M Adversely.

10.11.1 No silt trap had been provided at the outfall junction of raw water inlet channel into the S&S tank to check inflow of sand into it which reduced its holding capacity.

10.11.2 No floating arm had been provided in one of the two no. S & S tanks at water works Dayyar, the feeder source of water supply to village Jogiwala, which would not permit drawal of biologically safe water from the thermocline plane.

10.11.3 Inadequate top layer filter sand i.e. 1'-6" against the designed requirement 2'-3" is likely to result in animpaired quality of filtrate.

10.11.4 Declining rate of filtration due to inadequate pumping duration may also result in poor quality of the filtrate.

10.11.5 The chlorination of water was neither satisfactory nor commensurate with the rate of filtration.

10.11.6 No head loss gauge had been provided at the filter outlet to regulate the filter run.

11. Case Study of the Work of Providing Tubewell Based Water Supply Scheme to Jawaharpur Group of 34 villages.

11.1 The water supply scheme was commissioned during 4/1974 by installing 2 tubewells, each capable of yielding 10,000 gallons/hour at water works Jawaharpur to cope with the demand of ultimate population of 26076 persons with a water allowance of 10 gpcd.

11.2 Simultaneously, during 1973/94, a boosting station was constructed exclusively for providing water supply to village Nimbuan.

11.3 With the system still not working satisfactorily this scheme was trifurcated during 1993/94 as below:

i) Providing water supply to Jawaharpur group of 12 no. villages. (Inclusive of 1 no. village which was earlier being served from an adjoining system.)

ii) Providing water supply to Samgoli group of 15 no. of villages.

iii) Providing water supply to Nimbuan group of 8 no. villages.

11.4 Though the tubewells at these three locations had been installed and commissioned during 1993-94, yet the work of pipe network replacement is yet to be carried out to extend the requisite facility benefit to the community.

11.5 Case Study Observation

11.5.1 The scheme had an element of inherent erroneous planning as below:

i) The pumping machinery had been designed for 16 hour working a day but the pipe network had been designed with the peak factor as 2. Still further the actual supply had been made to the group split into 2 zones i.e. 19 no. and 15 no. villages with a daily supply duration of 4 hours to each zone.

ii) The system, prior to its trifurcation had been in operating at about 30% of the designed per capita supply.

iii) Terminal pressure at the 15-20 kms. distant village locations was negligible due to higher line losses. Besides, location of some of the tail end villages was around 60 ft. higher than the level of site of the water works. Consequently, right from the commissioning of the system, the following villages were virtually without any water supply:

1. Seoli
2. Patehpur.
3. Behra
4. Rampur Sainian
5. Nimbuan

iv) There were hardly any technical traits to hop over a cluster of villages to extend service to a village across and the enroute village being served from a different scheme.

v) It was revealed that though an adequate supply was being pumped from the water works yet its quantitative availability and qualitative accountability at the consumer end was not really a matter of concern.

There was unchecked wastage from water hydrants, both public and private. The chlorinator provided at the water works was rendered non functionional due to depletion of the Bleaching Powder stock. Out of 48 no. water hydrants 36 nos. were without water taps.

vi) A visit to villages Jawaharpur, Mukandpur, Beijanpur, Miyanpur and Kuranwala revealed that there was no supply in village Mianpur and Kurranwala. It could also be safely inferred that even village Tohfanpur, being an extension from village Miyanpur, must be without supply of water.

vii) It was also observed that:

a. There was no documentation of the pipeline laid for village Tohfanpur.

b. The supervisory staff was not even aware whether supply to the village was functional or not for the last three years or so.

c.(i) The rising main from village Kheri Jattan to Village Mianpur was laid through a waste water pond thus rendering it inaccessible for any repairs and also amenable to water contamination during low pressure.

c.(ii) Out of the two untapped public hydrants provided in village Mianpur, one of them, provided in the midst of a brick paved street, was near a bottom fed overflowing pit resulting from a naked vertical G.I. post which had been removed. The overflowing pit was bound to contaminate the pipe water supply during low pressure.

c.(iii) Similarly the second stand post was a mere remnant of a bare G.I. vertical pipe, without a pucca platform and existing by the side of a broken edge of a storm sullage drain with a swamp around it. Interestingly, the open end of the vertical pipe stood plugged, apparently permanently, with a wooden plug.

Thus it was safe to conclude that a water facility with such a level of maintenance was certainly not fit for human consumption.

11.5.2 Still further, the existing zero accountable service, resulted in a situation where water supply to about 5 no. enroute villages (drop out of another existing system) without evaluating the end impact on the tail end villages. The 5 villages were thus deprived of water from both systems.

11.5.3 The system had thus completely collapsed due to poor planning, deficient designing and an overloaded O&M without quantitative and qualitative system evaluation.

12. Case Study of Spring Based Water Supply in Himachal Pradesh

12.1 Case study of 2 no. water supply systems was carried out. One of these two schemes was constructed and maintained for a while by the Department of Rural Development and the other scheme was constructed and being maintained by the Irrigation and the Public Health Department (I.P.H.)

12.2 *Case study of the work of providing water supply to village Cheli district Shimla* (H.P.)

12.2.1 This scheme constructed and commissioned during 1972 by the Department of Rural Development is based on a spring originating from the Cheli Nala. The spring water flows in to an uncovered concrete in-take chamber through an unlined open channel amenable to frequent chokage and contamination due to slippage of the mountaineous side slopes, fall of leaves and wild growth. Further contamination takes place due to sewage emanating from the uphill habitations. The situation worsens during the rainy season.

12.3. There is no approach to the spring source and the approach to the intake chamber is hazardous.

12.4 The water from the intake chamber is being conducted through a H.D.P.E. pipe to a distribution tank which incidentally is uncovered and was rendered non-functional due to profuse leakage.

12.5 The conduit from the intake chamber to the proposed distribution tank had an open joint to facilitate a consumer enroute to plug in his service pipe with the supply main from the intake chamber. This resulted in disconnection of the supply to about 20 hamlets down below. After the consumer's demand is fulfilled, the supply from the intake chamber is reconnected to the supply main laid up to the distribution tank. From here, supply to the other 20 hamlets is made through 4 no. open jointed protuding pipes. To draw and let others draw their share of supply depending upon the varying availability of water due to seasonal variations is a matter of sheer co-operation among the community members.

12.6 This system had been virtually left to itself because the Department of Rural Department) was not maintaining it in pursuance to a decision taken by the Govt. about 7 years back that henceforth O&M of such systems would be carried over by the department of I.P.H. The department however had not taken over the responsibility of O&M on the ground that such schemes needed heavy repairs for which funds were not being made available by the Govt.

12.7 It was revealed during the site inspection that the uncovered and on-line channel from the spring to the intake chamber frequently got block and had to be cleaned by each village. Similarly the H.D.P.E. pipe frequently got choked due to sand inflow and had to be regularly flushed, say about 2 to three times a week, to keep the water flowing.

There were also complaints that due to uphill development the resulting sewage/sullage gravitates through the same Nala thereby seriously polluting the spring source, particularly during the rainy season. The water quality is rendered absolutely unfit for human consumption and the villagers have to trek across the Cheli Nala to meet their water demands from the lift water supply scheme Mehli, being maintained by the department of I.P.H. since 1972.

12.8 Thus, it would be safe to conclude, that there was hardly any system and the villagers had been left to nature to survive.

12.9 Case Study account of the work of providing lift water supply scheme (spring based) for Gharog and Ghandal group of 16 no. villages in Gram Panchayat Nehra and Shakrah Tehsil and District Shimla.

12.9.1 Scheme Background

The spring source for the scheme originates from Ghanati Nala which is about 4 km. uphill of the intake chamber. The surface flow in Ghanati Nala from spring site up the intake chamber dries up during summer season and it is only the subsurface flow which is perennial and surfaces again at the site of the intake chamber.

The spring flow measured in June 1996 is 1/2 LPS i.e. about 9,600 gallons a day, which is about 1/10 of the flow of the spring as measured in June 1981.

12.9.2 The Ghanati Nala right from the site of the spring to intake chamber is unprotected and so also is the intake chamber itself. The site inspection revealed remnants of cowdung, leading to the concludion that the site of the intake chamber frequented by the stray cattle in hunt of water during summer period. The spring source is thus exposed to the hazards of pollution.

12.9.3 The water from intake chamber gravitates to an underground storage of some 20,000 litres capacity constructed in village Sarog.

12.9.4 The capacity of the pump installed at the house is 3.25 LPS.The average pump operation during the dry months has been about 4 hours a day for the last approximately six years. This means that about 46,800 litres of water is being supplied to the 16 no. of villages against a water requirement of 62,440 litres a day.

However during the summer months when availably of water from the spring is especially scarce, the supply to the group is divided into two zones.Each zone is supplied water on alternate days and the per capita supply during these months works out to 15 litres per capita per day as against the designed requirement of 40 litres per capita per day.

The per capita supply entirely depends upon the yield of the spring. During summer months it almost reaches an alarming situation. However there is absolutely no problem in regards to the terminal pressure availability.

12.9.5 The distribution of water to the various villages is regulated through manually controlled valves to permit various villagers to draw their

demands proportionate to the availability of water. This is virtually an agreed and symbiotic arrangement of coexistence. There is however a big snag in this system. The consumer down below is entirely at the mercy of an uphill consumer who may tamper with the control valves in an unauthorised way to overdraw his share of water andthus adversely affect the supply to a consumer down below.

12.9.6 Qualitative control was completely lacking due to non chlorination of water.

12.9.7 The system as such had absolutely no accountability in regard to per capita supply, no consideration for qualitative control. The system was being mechanically operated to ensure equitable water availability but the final distribution of water was left to a symbiotic existence.

13. Ground Status of O&M Service

13.1 O&M of the rural water supply system in the three states of Punjab, Haryana and Himachal Pradesh vests with the respective State Govt. inclusive of the entire financial liability.

13.2 Seized of the fact that the State owned O&M system, particularly its distribution network is not working well, efforts are underway in all the three states to gradually entrust the O&M responsibility to the respective community. An account of the efforts made so far is given below.

13.2.1 In the state of Punjab, it was proposed to experimentally handover the limited O&M of distribution hydrants to the villages. Out of 34 village Panchayats, 11 did not respond to the Govt. proposal and did not accept the financial assistance extended to the Panchayat. The remaining 23 Panchayats agreed initially to the proposal and accepted the financial assistance but subsequently changed the decision and returned the financial assistance.

13.2.2 In the State of Haryana, a proposal initiated long ago by the Govt. in the Public Health Engineering Department (the nodal agency so far, for execution and subsequent O&M of the rural water supply system) in regard to limited take over of O&M of water supply system by the village Panchayats etc. still awaits crystallization.

13.2.3 Similarly in the state of Himachal Pradesh the situation has not been any different. It was revealed that the state Govt. decided about 7 years ago that the rural water supply systems executive functions and subsequent maintainence by the Department of Panchayat should be taken over by the Department of Irrigation and Public Health. The aim was to improve the maintenance status of the network.

Unfortunately the proposal became problematical due to the Panchayat Department immediately washing off its hands from the liability. On the other hand, the department of I. & P.H. has still not shouldered the responsibility for want of funds on account of the schemes falling under the administrative control of Public Health circle Shimla.

i)	Total no. of Schemes	=	794
ii)	No. of schemes taken over by the department of I. & P.H.	=	228
iii)	No. of schemes still to be taken over	=	566

iv) Status of 566 schemes

i) No. of schemes partially functioning = 155

ii) No. of non functional schemes = 345

iii) No. of non existing schemes = 34

v) Obviously these 566 nos. of schemes have been left to Nature to maintain. A case study of a such a system i.e. providing a water supply to village Cheli as reflected in 12.2 above is the most appropriate testimony of this observation. This scheme must be of a comparatively better maintained status. Keeping the O&M status of this scheme in view, the scenario else where can well be imagined.

13.3 Level of Community Participation

13.3.1 So far, community participation has been completely lacking in all the three states . The community is not aware of the physical and financial inputs required to set up a system and as such is not able to appreciate the significance of the service or its accrued benefits.

The water authorities in the three States are performing mechanically without monitoring the extent of supply being beneficially used by the community. Similarly, the communities — not having been associated with the schemes at any stage — feel equally unconcerned and unperturbed over the issues of clean water and water wastage.

13.3.2 In the state of Punjab, there was limited community participation — not at the time of planning or laying of the system, but only to monitor the O&M of the facility. There were two committees constituted for the purpose:

i) District level committee

The Chairman of the committee was the concerned superintending engineer of the public health department and its members were the elected M.L.As. of the area besides the concerned officer of the block administration, and the Zilla Parishad. This committee has been doing a splendid O&M job but due to certain snags such as changes in its constitution, meetings have been dispensed with for the last 7 to 8 months.

ii) Village level committee

A committee under the chairmanship of the village Sarpanch and the elected Panches as its members, along with the Junior Engineer of the Public Health Engineering Department, periodically reviews the function of the village water supply system in an effort to improve its O&M.

13.4 Complete lack of cost recovery

13.4.1 The entire O&M liability is being borne by the respective State Govt. In such a free service situation the water authority is rendered unaccountable for both quantitative or qualitative system efficiency. Equally unconcerned are the beneficiaries, as they are not required to bear the brunt. This results in:

i) Financial drainage

ii) Perpetual and ever increasing State financial liability for O&M resultanting in an increasing squeeze on the State resource for capital construction.

iii) Depletion of water resources.

iv) Reduced per capita supply due to avoidable waste of water from the public hydrants.The resultant stagnant pools of water are bound to have an adverse impact on people's health as well as the environment.

13.5 Inadequate and inappropriate funding of the system.

13.5.1 The observed impact attributed to inadequate and inappropriate funding of the system has been well reflected in the case study of the works, in all the three States, where the system was conceived and commissioned about two decades ago. The desired performance is still a distant dream.

13.6 Lack of service regulation

13.6.1 Legislation, to regulate satisfactory service has not been enacted and enforced in any of the three States of Punjab, Haryana and Himachal Pradesh.The situation does not inspire any fear amongst the public of severe penalties for acts of vandalism, damage to the system network and unauthorised drawal of water from the system. This has been well reflected in the case study of the works in all the three States.

13.6.2 The service legislation needs to be suitably facilitate the mechanical establishment personnel deployment to run the system. Uptill now, in all the three States of Punjab, Haryana and Himachal Pradesh, it is almost impossible to affect even the transfer of an unwilling worker without inviting problems.

13.7 Empowering the ground operators to finally settle an act of indiscipline

13.7.1 Powers to punish the guilty does not vest with the ground operators in any of the States, of Punjab, Haryana and Himachal Pradesh. As a result, mechanical workers have scant regard for their supervisors thereby adversely affecting O&M.

14. Observed Significance of O&M

14.1 It can be concluded that the problems of O&M are sown the moment a water supply system is not well conceived and designed. The seeds germinate and the problem is aggravated when the system is not well laid. The problem finally flares up when entrusted to ill trained and incompetent operators.

15. Recommendations for Improvements in the Maintenance System

15.1 Involvement of the community right from the stage of project planning till its completion and commissioning.

15.2 To handover the upkeep of public hydrants to the Panchayat, with particular emphasis on involving the women folk.

15.3 There should be nothing like a "free service" after completion of a facility at the expense of the Govt. as a welfare gesture to the people. The community must bear the entire O&M cost to insure waste free, accountable and assured service.

15.4 Enactment of adequate legislation to guard against acts of vandalism, damage to the system and unauthorised drawal of water from the system network.

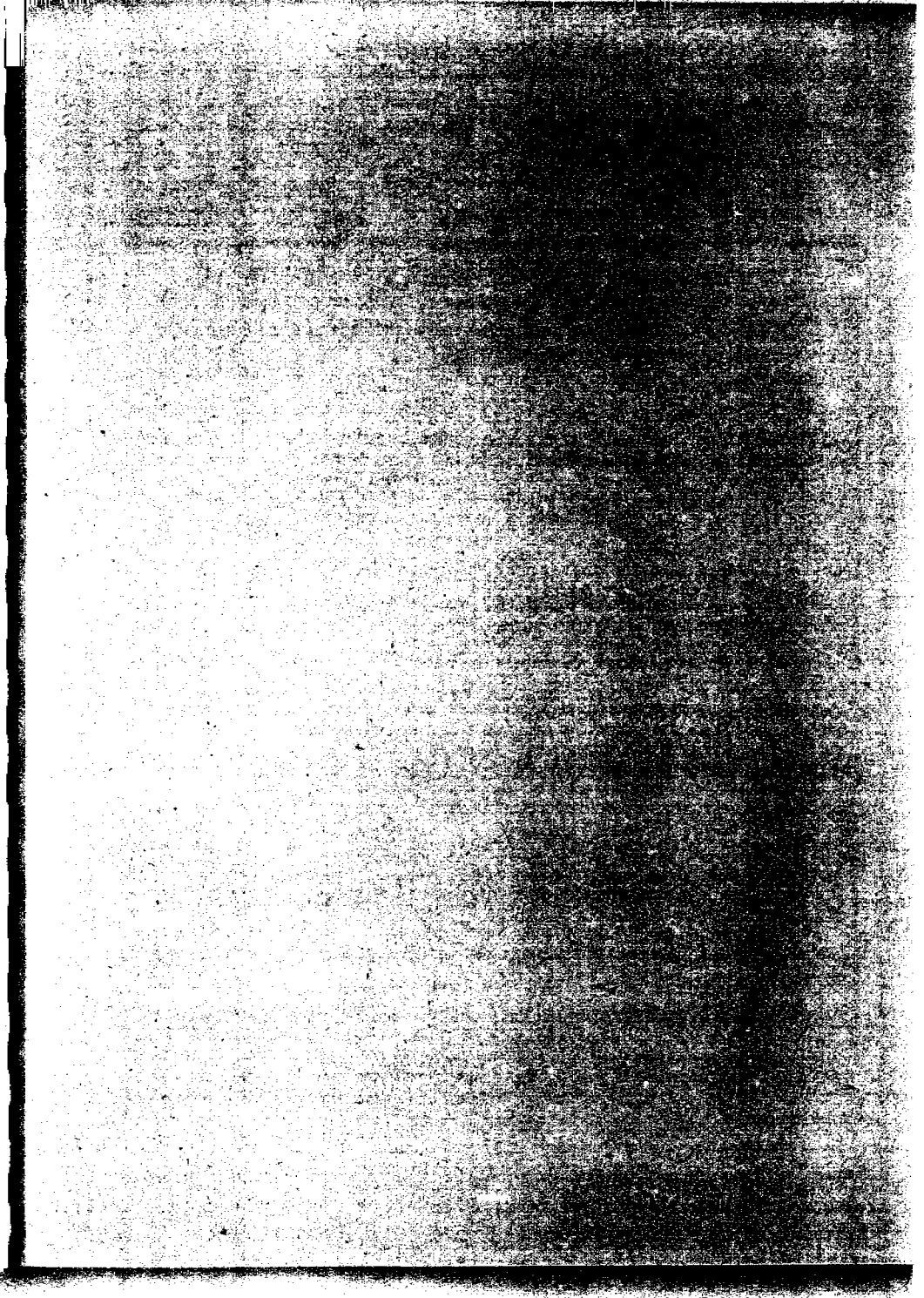
15.5 Enactment of laws against over exploitation of ground water, particularly in the grey areas, and adoption of water harvesting structures to atleast sustain the sub soil water against any further depletion.

15.6 Identify the catchment areas of the spring sources where the yield is depleting. If this is not done right now, the yield of the spring may deplete to a non functional level.

15.7 Empowering the ground operator adequately to administer the service effectively and also finally settle any act of indiscipline and dereliction.

15.8 Periodical interaction between the representative of the water authority and the health agency to review the improvement in the health status attributed to safe water supply.

15.9 However all this could only be possible in the event of control of O&M being with a water supply corporation rather than being with the Government sector.



NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

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New Delhi

Medinipore Sanitation Project – An Alternative Service Model

Drinking Water Management Based on Community Participation

S.S. Chakraborty

Why An Alternative Delivery System?

Till the Seventh Plan period, sanitation was not a major programme of action in the country's development plan. Whatever low cost latrines were constructed during this period were on a turnkey basis and not with an integrated approach. Even though the approach was backed by 100 per cent subsidy, only 3 per cent of the households could be covered as against the target of 25 per cent during the Water and Sanitation Decade.

In West Bengal, the overall construction of low cost latrines under rural sanitation was 12.31% till 1991. There are many instances however, where, even though latrines were constructed, they were not used at all. Besides, sanitation was never taken up as an integrated concept which includes not merely disposal of human excreta but other elements such as village waste disposal, waste water disposal, home hygiene, environmental sanitation, supply and protection of safe drinking water etc.

The entire Government policy being subsidy-based, the target encompassed only people below the poverty line. No effort was made to motivate the people above the poverty line who constituted the majority of the population. There were no delivery mechanisms to promote low-cost sanitation among people above the poverty line. At present, around one hundred million rural households have no latrine facilities. If the present subsidy of Rs. 2,000.00 per household continues to be provided the country will require Rs. 20,000 crores which is hardly feasible for the Government to arrange in the near future.

Ramakrishna Mission Lokasiksha Parishad has been involved in Rural Development for about four decades. Since the early eighties, the Parishad has, with UNICEF assistance, been trying to promote low-cost sanitary latrines on a modest scale. As all the Parishad's programmes related to socio-economic development have a component of people's contribution, the same practice was continued in promoting sanitation as well. The degree of people's contribution was high ,varying between 40% to 80%.

In the late eighties the Parishad was asked by UNICEF as well as the State Government and Government of India to take up a sanitation programme on a bigger scale without any subsidy. The Parishad accepted the challenge and the programme was started in one of the biggest districts of the country viz. Medinipore, with 14,52,040 households. Thus from the very beginning an Alternative Model of Rural Sanitation were tried in the district.

Medinipore Intensive Sanitation Project

An Overview

It is widely known that in spite of all efforts, our achievements during the Water and Sanitation Decade - particularly in the field of sanitation - have been extremely low. Against the target of at least 25% coverage, only a meagre 3% was achieved by March 1990. It was in this context that the Intensive Sanitation Project, Medinipore was conceived and executed by the Ramakrishna Mission Lokasiksha Parishad (RKMLP), Narendrapur with support from UNICEF and the approval of the Central and State Government.

Feedback analysis showed that the poor performance was due mainly to a subsidy oriented approach and emphasis on hardware instead of software. If one were to go by previous attempts to provide major subsidies towards construction of sanitary latrines, it would,with the present level of budgetary allotment for the purpose, never be possible to ensure latrine facilities to all the 100 million rural households in the country even within one century.

Again, by and large, the modus operandi so far was to provide a family with a latrine and then expect it to be used by the family as a matter of course. There was no health education, no attempt at awareness generation and no efforts to make the people realise that the latrine is a felt need for them.

Obviously, the Medinipore experiment had to be designed so as to do away with the subsidy component altogether and to lay emphasis on the Information, Education and Communication (IEC) aspect of the programme. The salient features of the project (ISP, Medinipore) may be enumerated as-

1. Emphasis on health education for the purpose of demand generation.
2. Emphasis on self-finance sanitation.
3. Involvement of and implementation through a village level voluntary organisation.
4. Motivation of the families through trained motivators (village volunteers).
5. Development of multiple low-cost models of sanitary latrines to suit the economically backward families.
6. Local production of latrine components at the block level by a voluntary organisation and even installation by them through trained masons.
7. Payment of small incentives to motivators on the basis of performance.
8. Small scale subsidy (not exceeding Rs. 200) per family living below poverty line.
9. Provision of constant monitoring and periodical review of the performance through suitable district and State level committees.
10. Involvement of beneficiaries group in implementation and maintenance of units.
11. Joint efforts of Panchayati Raj institution and NGO in sanitation education and motivational work.

The prime objective of the project is promotion of community health, with the following goals :

i) To reduce the IMR and water borne diseases by providing improved sanitation education and low cost sanitation facilities at household level and institutional level.

ii) To make people aware of personal hygiene, food sanitation, safe water, excreta disposal, solid and liquid waste disposal, disease transmission process and relationship of safe water and sanitation with health.

iii) To create a better and safe environment for better living through a package of total sanitation measures.

iv) To introduce low cost and appropriate technology, making it both affordable and acceptable to different categories of people in rural areas.

v) To develop and test a methodology and operational strategy so as to make the sanitation programme self-sustaining and self-expanding.

vi) To involve the community, specially the local youth clubs/women's groups in planning and implementation of the sanitation programme at the grassroot level.

vii) Establish intersectoral linkages to help and promote immunisation, ORT, nutrition education and income generation activities amongst the women.

The implementation infrastructure and review infrastructure are as follows :

Implementation Infrastructure	**Review Infrastructure**
Central Level (RKMLP)	State Level
↓	↓
Middle Level (Consortium of village clubs)	District Level
↓	↓
Grass-root Level (Village Club)	Block Level
↓	↓
Wat-San Committee (Beneficiaries Group)	Gram Panchayat Level

In the implementation infrastructure, the project formulation WAT-SAN Committee with 7 members is at the bottom level. Out of those 7 members, one is deputed from NGO/Panchayat and the other 5 members (of whom at least 2 must be women) are drawn from the beneficiaries.

The Review infrastructure consists of the following members :

1. State Level

Minister-in-Charge of Rural Development Department and Secretary of Rural Development, Health, Public Health Engineering Department (PHED), Representative of UNICEF, Calcutta, and Rama Krishna Mission Lokasiksha Parishad (RKMLP).

2. District Level

Chairman of District Panchayat, Karmadhyaksha of Jana Swastha, District Collector, District Panchayat Officer, Chief Medical Officer, Executive Engineer Zilla Parishad and Public Health Engineering Department, Representative of RKMLP, Narendrapur and UNICEF.

3. Block Level

BDO, Chairman of Block Panchayat, Karmadhyaksha of Janaswastha of Block Panchayat, All Gram Panchayat Pradhan and Representative of cluster organisation (NGO).

4. Gram Panchayat Level

Pradhan of Gram Panchayat, 5 Members of Gram Panchayat and representatives from all NGOs involved in sanitation work.

Successful implementation of such an ambitious programme presupposes thoroughly planned and organised human resource development, with particular emphasis on the training of personnel involved in the implementation process. Uptill now, the project has organised software training programmes and produced advocacy materials as detailed below:

Software Training Organised (upto May, 1996)

Sl. No.	Course	No.	Participants
01	Training of Village Sanitation Motivators	135	4658
02.	Orientation on Sanitation for Youth Club Leaders	983	2561
03.	Training on Intensive Sanitation Project (ISP) accounts	16	432
04.	Orientation on Sanitation for Panchayat Members	149	9531
05.	Training on Sanitation Song	3	55
06.	Orientation for Task Force	4	108
08.	Training for ORS Depot Holders	46	1796
09.	Training for Project Personnel	5	225

Hardware Training Organised (upto May, 1996)

Sl. No.	Course	No.	Participants
01.	Seed Mason Training	5	73
02.	Village Mason Training	55	1149
03.	Tara Hand Pump Women Care-taker Training	44	919
04.	Training on Hand Pump drilling	2	41
05.	Training on Smokeless Chullah Construction	44	969

Advocacy Materials Produced

A. Flash Cards on ISP

B. Pictorial Calendar on ISP Concept

C. Folder on ISP

D. Leaflets

   i. About the project

   ii. Special Features on low cost latrines

E. Booklet

   i. Question Answer book for volunteers

   ii. Technical Drawing Book

F. Audio Cassettes on Sanitation Songs

G. Video Film

   i. Documentary on ISP

   ii. Feature film on Sanitation motivation

   iii. Spots in Bengali : Safe water, Sanitation, Hand Washing, ORS, Food Hygiene, Open Defecation, Prescription for health.

Physical Achievements of IEC Activities (upto May, 1996)

Tools for Spreading Messages

Sl. No.	Tools	No.	Participants
01.	Motivation Camp	2502	1501200
02.	Video & Slide Show	1581	950000
03.	Wall Writing	10040	2008000
04.	Sanitation Songs Programme	1538	948600
05.	Exhibition	390	195000
06.	Home Visit	584076	2920-380
07.	Group Meeting	4996	146868

Outcome of the Project

Implementation of the project has resulted in several outcomes:

1. Evolution of the programme as a sanitation movement creating awareness amongst rural people for the need for total sanitation.

2. Encouraged by the example of a sanitation village, neighbouring villages come foward to get benefits under the project.

3. Creation of a sense of self-respect and importance for village women folk who are now playing key roles in adoption of household sanitation facilities and are also being given the entire responsibility for repair and maintenance of village tubewell.

4. Employment generation in the rural areas.

5. Practical demonstration of theories:

   a) that demand generation can be best achieved by proper IEC work and

   b) that people are willing to pay for a facility which is their felt-need, and within their means.

6. The Project has acted as an eye-opener for the administration at different levels and the Government has scaled down the subsidy component to a minimum level.

7. Encouraged by the Medinipore success, some other State Governments have also opted for a self financing project.

8. Marked downward trend in IMR and diarrhoeal disease in villages which have accepted the use of latrines.

9. 130 villages have already achieved the goal of hundred percent coverage of households. There is a larger number villages which have achieved a coverage between 50% to 70%.

10. Following the Medinipore model, the Government of West Bengal have started establishing Sanitary Marts in all the districts. 140 Sanitary Marts covering 140 Blocks,have already been established. The Government is trying to cover all the blocks — numbering 341 — within the next two years.

11. The Sanitary marts are being managed by locally based Non-Government Organisations and supervised by the Panchayats.

What are the Constituents of The Alternative Delivery System?

From the above review of the Medinipore project, it will be observed that the following elements constitute the alternative delivery mechanism:

1. The major emphasis is on Information, Education, and Communication so that effective demand generation takes place.

2. To achieve the objective of comprehensive sanitation throughout the length and breadth of the country efforts should be made to involve community-based NGOs supervised by the local Panchayats.

3. Networking of the organisation should be attempted both vertically as well as horizontally so that training, monitoring, evaluation and back-up support could be effectively organised.

4. Decentralised establishment of Sanitary Marts, at least one in each block, viz. roughly about 6000 units in 6000 blocks in the country.

5. Supply of credit fund has to be ensured through commercial banks, thrift and credit groups, dairy co-operative, other village credit co-operative societies, Mahila Samridhi Yojana, Mahila Kosh etc.

6. Package of sanitation services should be promoted viz. safe drinking water, human excreta disposal, solid waste disposal, disposal of waste water, domestic sanitation, food hygiene and village sanitation.

7. Linkages need to be established with other Government Departments like Health, Education, Social Welfare, Rural Development etc.

8. There should be a number of options for the people to choose from when constructing their own latrine.

9. Training of all categories of people should be adequately emphasised.

If we are serious about rural sanitation, available experience exemplifies that it is possible to achieve the goal provided there is adequate Political Will and strong Administrative Support from top to bottom. It has been observed from NSS studies as well as the UNICEF sponsored Multi-Indicator study, that for each latrine promoted by Government effort there are 4 to 5 additional latrines constructed on private initiative.

In the Medinipore experience we have found that as a result of vigourous rural sanitation campaigning organised in the villages, approximately 3 to 4 times additional latrines, over and above RKMLP's effort have been constructed through private sectors. Thus as against the total construction of 1,19,951

latrines till May, 1996 through the Mission's efforts, an additional 4,00,000 (approx.) latrines have been constructed during the intervening period. We have taken up a study in this respect in Medinipore district on a sample basis.

We strongly urge that instead of providing direct subsidy to the individual beneficiary, we should allocate more funds, say about 30 per cent of the budget, on IEC Activities. Subsidy fund may be allocated for creating a Credit Fund from where NGOs', Panchayats and voluntary action groups can be provided grants for developing the infrastructure for production centres/Sanitary Marts and provide the fund for working capital.

In addition, in villages which achieve 80 per cent and above coverage, the communities may be suitably rewarded by providing certain infrastructural facilities in the villages which will further improve the overall sanitation environment. We are confident that if such a comprehensive approach is adopted, as part of the Ninth Plan, and by each and everybody, we will be able to achieve 60-70% coverage in the country — if not 100 per cent — by the year 2002.

Drinking Water Situation in India : A Perspective

In the year 1977, the United Nations Water Conference separated the issue of drinking water and sanitation from other water issues to stress the seriousness and magnitude of the problem of drinking water. It suggested provision of a realistic standard of quantity to urban and rural areas by 1990.

As a signatory to the said conference, the Government of India launched the Intensive Drinking Water Development Programme on 1st April, 1981 to achieve the target of entire population of the country by 31st March, 1991. In 1985, the subject of Rural Water and Sanitation was transferred from the Ministry of Urban Development to Rural Development for speedy implementation of the programme and integration of the Rural Drinking Water Supply Programme with other rural development programmes in the country. In 1986, the objective of intensification of efforts led to the launching of the National Drinking Water Mission as one of the five societal missions. The mission was later re-named as the Rajiv Gandhi National Drinking Water Mission. The above Mission was launched with the following objectives :

1. Cover all no-source problems habitations to supply 40 LPCD in all areas for human consumption and additional 30 litres in desert areas for cattle within accessible reach;

2. One hand pump or stand post for every 250 persons;

3. Water source should exist within 1.6 km in the plains and within 100 meters elevation difference in hilly areas;

4. The water is defined as safe if it is free from biological contamination and chemical contamination;

5. Evolve cost effective technology to solve specific problem;

6. Take conservation measures for sustained supply of water;

7. Improve performance and cost effectiveness of ongoing programmes;

8. Create awareness on the use of safe drinking water;

9. Promote community participation.

With the approach adopted by the Mission, significant physical coverage was made so far as the Rural Drinking Water Supply Programme was concerned. During the period 1991-1994, a validation survey was conducted. As per the validation survey, the position stood as follows on 1.4.1994:

1.	Not covered habitations	1,40,795
2.	Partially covered habitations	4,30,377
3.	Fully covered habitations	7,47,347
	Total	13,18,519

In this connection it may be mentioned that originally water was to be supplied to the revenue villages. But it was observed later that main villages include several habitations which were not covered by a separate source of drinking water even though they were quite at a distance from the main source. This is the reason for the total number of habitations being almost double the original number of revenue villages.

In the meanwhile, during the intervening period between 1994-95 and 1995-96 a lot was achieved and yet, as on 1.4.1996 the number of left-over habitations stood at 79,000 throughout the country.

From the point of view of physical achievement, the Rajiv Gandhi National Drinking Water Mission covered the major areas of the country. But the problem of supplying safe drinking water still continues in many parts of the country due to several reasons.

As a member of the Expert Committee constituted by the Government of India under the Chairmanship of Dr. P.B. Sundaresan, the former Director of NEERI, Nagpur, and Ex-vice-Chancellor, Madras University, to look into the status of drinking water supply and sanitation in the country, I had the privilege to apprise myself of the actual state of affairs regarding the supply of safe drinking water in rural areas. During the course of the study we noticed the following limitations :

1. In many areas location of the water source was decided more by political pull than by the rationality of the population distribution in the habitation. As a result the benefit of safe drinking water source could not be availed of by the majority of the people in a given village.

2. Though the hardware part of the water supply was met to a great extent either by installing a hand pump or piped water, no effective measures were taken to ensure the regular functioning of the facilities installed. Often the sources were not maintained regularly due to the lack of an operation and maintenance fund;

3. At places the quality of water was not checked effectively, more so in the case of hand pumps. As a result, people were not getting safe drinking water supply;

4. At many places it was noticed that due to the poor maintenance of the environment, underground water source was getting polluted;

5. Though the objective of the Mission was to implement an integrated water policy , in most cases the supply of drinking water and the requirement of water for other purposes, mainly agriculture, was not synchronized. Due to the excessive withdrawal of ground-water for the purpose of irrigation, water sources became dry and as a result people were not getting the required quantity of drinking water;

(Data source - Rajiv Gandhi National Drinking Water Mission, Government of India)

6. While installing the water facilities only those technologies which were more expensive were emphasised, notwithstanding the availability of low cost and user friendly technological options with different lifting ranges. In fact, when source of drinking water in a given area dries up, people fall back upon the traditional sources like ponds, kunds, springs etc. No attempt was made to strengthen and improve the traditional sources resulting in over dependence on externally funded high cost project;

7. Due to the extensive use of insecticides and pesticides for cultivation purposes, the surface water of rivers, ponds, lakes etc. are also getting polluted. No effort has been made to educate the people about this problem. As people are compelled to use surface water for most of their household activities including drinking water during the dry season, the objectives of the Drinking Water Mission are not fulfilled in many instances.

8. Due to unplanned installation of irrigation wells in or very close to the existing drinking water aquifer draw-down rates are very high and as a result discharge or water from existing drinking water sources became very poor particularly during the summer season.

9. There was hardly any attempt to initiate any effective programme of Human Resource Development and Information, Education and Communication for the user's groups to ensure efficient and optimum use of safe drinking water. As a result in many places, the whole supply system broke down.

10. Last but not the least, hardly any community participation for the implementation of the programme was considered. Nobody bothered to motivate the local community to take responsibility for the operation and maintenance of the installed water facilities.

Development of an Alternative Model for User based Operation and Maintenance of water source in the District of Medinipore, West Bengal

Ramakrishna Mission Lokasiksha Parishad, Narendrapur has been involved in the Rural Development Programme for over four decades. One of the basic features of the village development programme is that in every action there has to be people's participation. At the request of UNICEF, Government of India and the State Government, the Mission took up Intensive Sanitation Project (ISP) in the district of Medinipore during the year 1990. In this project, the sanitation facilities were constructed without any subsidy by motivating the people through the process of Information, Education and Communication.

As proper sanitation is not possible without safe drinking water, we also took up the sinking of drinking water tubewells in villages where significant progress could be made in installing household latrines. The design of the handpump which is called Direct Action Tara Handpump is simple. Initially developed in Bangladesh and presently introduced in India after considerable modifications with the assistance of UNICEF, Tara Handpumps are now being standardised and introduced in other parts of the country as well.

If we are to involve the people in such rural development programmes at the initial stage we should start with low cost and users' friendly technology. Tara Handpump fulfils both the criterion. It is very simple to operate and the cost is also significantly low because most of the components used are PVC made which are much cheaper than the G.I./Iron Components.

Besides technology, the following measures were taken for direct involvement of the people-

At the very outset a water users' committee with 7 members has been formed in consultation with all the beneficiary families for each tubewell. There should be one representative from the Panchayat or local NGO and a minimum 2 must be women representatives. This committee is given the entire

responsibility for site selection, extension of local help during installation, operation and maintenance of the tubewell, promotion of safe handling of drinking water etc. The functions of the water users' committee are as follows:

1. To identify a suitable site for the sinking of the tubewells.
2. To select and train women caretakers so that they can perform maintenance-job without external dependence.
3. For the maintenance of the pumps the beneficiary families are to pay Rs. 500/- at the outset and subsequently 50 paise from every family every month to create a maintenance chest fund. The collection of the fund is the committee's responsibility.
4. To keep the accounts and maintain all records in this connection.
5. To keep the surrounding of the tubewell neat and clean and also to educate the people on how to handle the drinking water during collection and to preserve the same in a manner which prevents it from becoming polluted.
6. Besides drinking water, the committee members take the responsibility of organising occasional meetings in the villages to promote health awareness, installation and use of low cost latrines and promotion of ORS for prevention of diarrhoeal diseases etc.
7. At intervals, the committee also arranges to get the water examined to safeguard the water quality of the tubewell.

Methods of Raising Contributions

Usually for each tubewell, there have to be 40 to 50 families. It has already been mentioned that each committee has to deposit Rs. 500/- before the pump is installed and also collect 50 paise every month from each family. At times, beneficiary families not being able to pay the contribution in cash may pay in the form of grain when the crop is harvested. The committee members also raise funds on the occasion of community festivals like Durga Puja, etc. along with the Puja contribution. So far, till March 1996, total cumulative maintenance fund deposit through different Users Committee, has been Rs. 4,10,200.00.

Arrangement of Maintenance of Tubewell

As mentioned earlier, at least two women caretakers have been trained for each tubewell for operation and maintenance. They are also provided with simple tool kits to undertake their repairing jobs. It has been observed that in most cases, within a short notice period, women caretakers who reside very close to the water sources do undertake repair work. Certain spare parts are kept with them. These spare parts are usually collected by the Water Users' Committee from the youth clubs which are associated with the water and sanitation programme in the village.

In case of major repairs, the club secretary contacts the Cluster Committee for necessary help. Besides regular maintenance, women caretakers also open the pump every month and clean the different parts and examine whether everything is in correct position. As a result, till date we notice that on an average only Rs. 45/- are being spent for the annual maintenance of these tubewells whereas in the case of Mark-II Hand Pumps the average annual maintenance cost in the Government budget is Rs. 300/- against the required amount of Rs. 600/-.

Achievements at a Glance

Total tubewells sunk	460
Total number of Women Caretakers	919
Total number of members of water User's Committee	2500
Training of Drilling Operators	41
Training of Master Trainers for Training of Women Care-taker	77

Organisational Structure

For the operation of the project we have set up a three tier organisational structure from the village to the district level.

i) At the level of the tubewell, water users' committee is the main body responsible for looking after the operation and maintenance of the water source.

ii) At the second stage we have a cluster level structure where secretaries of the respective clubs are represented besides Panchayat, Block and Lokasiksha Parishad representatives.

iii) At the third stage, there is the District Review Committee with the Sabhadhipati of the Zilla Parishad as Chairman and District Magistrate as the Convener. It also has representatives from Public Health Engineering Department, Panchayat Department, Health Department, UNICEF and Ramakrishna Mission.

This three tier organisational structure supervises and monitors the entire programme of water supply in the villages.

Subsequently, Medinipore has been declared as CDD-WATSAN District. The Zilla Parishad started sinking tubewells directly in the rest of the villages of the district on the lines of the model outlined above.

Impact of the Programme

We have already mentioned the physical targets attained so far along with the mode of operation for the supply of Drinking Water Programme in Medinipore. From the process of people's participation, we have noticed that starting from one aspect, viz., that of self-reliance, people are gradually entering other fields of activities such as sanitation, promotion of activities to control diarrhoeal diseases by popularising ORS etc.

Besides, these groups have the potential to promote thrift and credit activities along with employment generation for women. If one visits any of the water sites maintained by the people, one will notice the difference. It is a wonderful experience to see how women of the villages are operating and maintaining the tubewells on their own.

One cannot fail to notice the multiple impact of people's participation while promoting water and sanitation in the district of Medinipore. We strongly hope that this model will be replicated not only in other districts of West Bengal but also in other states of India for the improvement of water and sanitation environment in particular and socio-economic development in general.

Basic Elements of Community Participation in Relation to Drinking Water and Sanitation Programme

From the two cases studies presented on sanitation and drinking water supply, we can infer the following basic elements which need to be ensured for effective community participation in implementing the above programmes.

1. Information Education Communication (IEC) holds the most important place in eliciting community participation. Unfortunately these receive least importance in respect of implementing the development programmes of the country.
2. Next to IEC, development of human resources required for implementing the programmes need to be given serious attention. Training of people at different levels is required. Adequate manpower planning for this is an urgent need for successful implementation of the community-based drinking water and sanitation programmes.
3. To facilitate community participation, local wisdom and technology wherever available should be tapped.
4. Wherever possible, along with the sophisticated programme of water supply and sanitation, we should try to tap traditional water harvesting devices with which people are familiar. These sources and devices should be technologically improved as this will facilitate local people's participation on the one hand and enhance cost effectiveness on the other hand.
5. Beneficiaries should be consulted right from the planning stage till the completion of the project implementation.
6. Transparency should be maintained in all stages of programme implementation so that concerned people develop confidence about the integrity of the implementing agency.
7. To facilitate people's participation, the decentralised system of delivery mechanism should be developed. For this both horizontal and vertical coordination should be established.
8. Cost sharing of both the capital and operational maintenance must be insisted upon from the very beginning.
9. Both Panchayat and established NGOs in the area should play a promotional role but the beneficiary groups must be involved in all stages of programme implementation.
10. Political and administrative leadership of the concerned area play a very critical role in eliciting community participation. The Medinipore programme has been successful because of these two important critical inputs.
11. Panchayat and beneficiary participation is not one and the same thing. Often, by transferring the resources and power, we assume that community participation will be automatic. But this is not the case. There must be specific provision of community participation in the very design of the scheme.
12. Beneficiaries should be given the option in deciding the technology and the design of the project within the given parameter of the supply of safe drinking water and sanitary toilets. There should be some sort of cafeteria concept in promoting these activities.
13. Women play the most vital role in handling drinking water as well as in maintenance of sanitary latrines. Hence women's groups should be adequately involved in the planning and implementation process.
14. For successful community participation, convergence of services relating to different Government projects should be attempted. Coordination between different Government departments holds a very important place in promoting and strengthening community participation.

SUMMARY

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi

Decentralised Concept of Operation & Maintenance and Policy Environment

*K Mazumdar and **Jagdish Chander

According to the 1991 population census, about 692 million of India's population lives in rural areas. Owing to the fast pace of development all over the country, and specially in the rural areas since independence in 1947, there have been ever increasing demands on the available water sources in the rural areas. On the one hand the quantity, once easily and conveniently available, has been progressively decreasing. On the other hand, the quality of water available has become a cause for urgent concern. The available water resources are increasingly becoming vulnerable to pollution.

The handpump became an effective measure of the efforts of the Government to provide safe drinking water to people in rural areas. During the late seventies and eighties, the handpump became the living symbol of resurgence in rural areas.

Handpump Maintenance System

Different approaches have been adopted and attempted with the aim of keeping the maximum number of (approximately 2.6 million) handpumps in working order. Broadly, the approaches fall into the following categories:

(i) Government organised maintenance

(ii) Community or local body maintenance

(iii) Varying combination of these types.

Most handpump maintenance systems can be characterised as one-tier, two-tier or three-tier systems.

Norms

Rajiv Gandhi National Drinking Water Mission has adopted the following norms for providing safe drinking water to the rural population :-

a) 40 litres of drinking water per capita per day for human beings.

b) 30 LPCD additional water for cattle in desert districts (under Desert Development Programmes)

c) One handpump or standpost for every 250 persons.

d) Water sources should exist within 1.6 kilometres in the plains and within 100 metre elevation difference in hilly areas.

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Decentralised O & M Finds Expression Through Panchayati Raj Institutions (PRI)

In a country as vast and diverse as India, it is obvious that a centralised O & M by theGovernment cannot adequately ascertain the specific requirements of the people, involve and motivate them to participate in all rural development activities including provision of water supply systems.

At a time when the country is undergoing major changes in terms of rapid development, there should be more emphasis on grass root initiatives and less on centralised control. The people's right to demand better performance from Government institutions needs to be encouraged. It is only Panchayats which can make that happen more meaningfully. It is this deep seated desire to empower the village masses that has led to the emergence of the new Panchayati Raj under the 73rd Constitutional Amendment, which was passed as an Act in 1992.

All the major States in the country now have a three-tier Panchayati Raj System i.e. at village, block and district levels. Panchayat institutions can be strengthend through the following steps:

a) ***Devolution:*** Having constituted Panchayats, steps should be taken to make them functional through devolution of adequate powers of planning, implementing,operating and maintaining the water supply system.

b) ***Financial Support :*** There is an urgent need to devolve adequate finances to PRIs, pending the recommendations of the State Finance Commissions in this regard.

c) ***Mobilisation of Resources :*** Panchayats must be empowered and mobilised to raise their own resources — initially for total O & M cost recovery and subsequently for rejuvenation of the old systems.

d) ***Administration Strengthening :*** Keeping in view the increased flow of funds and the responsibilities bestowed on Panchayats, they need to be strengthened administratively and technically.

e) ***Planning :*** Appropriate mechanisms will have to be evolved for preparation of water supply project/system plans including O & M system keeping in view the socio-economic requirements, the resource availability and the affordability aspect vis-a-vis the community.

f) ***Training & Awareness :*** Newly elected members of Panchayats should be oriented to their new responsibilities through information and education which will equip them fully to take up their new roles of planners and implementors who can sustain the infrastructure developed, (in this case water supply systems). For this purpose all mediums of communication should be used and the process should be a continuous one.

g) ***Transparency :*** The Panchayats must ensure transparency and accountability in their functioning to strengthen the faith of the people in the institutions of self governance.

Social Mobilisation : Panchayats must mobilise people for social development, in particular, health, water supply, sanitation programmes with emphasis on women and child welfare etc.

Recommendations

1) To begin with the Panchayats should be entrusted with all aspects of O & M of water supply system. When the system has been strengthened and equipped, Panchayats should be involved in the implementation of the total water supply schemes and in the process of sustaining the system.

2) National norms for cost recovery need to be formulated and implemented taking into consideration the community below the poverty line and the type of water supply system provided. The norms should be based on the following approach:-

   a) 100% cost recovery for O & M.

   b) For new water supply schemes which are in accordance with the norms laid down by the Union Government, PRI should at least provide land free of cost or contribute 10% of the capital cost of the project, whichever is more.

   c) For water supply schemes in which the PRI desires additional facilities in terms of quality of water and / or installation of drinking water supply points in relaxation of the norms laid down by the Union Government, the PRI should bear the cost difference in addition to the condition mentioned in the preceding para.

3) Water user committee at the Panchayat Level should be formed immediately for proper O & M of the schemes and forawareness creation.

4) Action Plan for sustaining the existing water supply systems should be prepared well ahead of time for effective implementation, especially during the summer and drought periods.

5) The community, particularly women, should be encouraged to participate in the planning, site selection, implementation, completion and O & M of the water supply systems.

6) An effective user friendly information system for public knowledge should be developed.

7) At the National/State level, an award scheme and issue of certificate of excellence should be introduced (annually) in recognition of the outstanding performance of Gram Panchayats in the sector to generate motivation among the other PRIs.

8) Annual workshop at the District/State/National level should be held to discuss the various models adopted in the O & M of the water sector and discuss threadbare the advantages & disadvantages of various systems adopted.

Issues to ponder upon

1. It is an undeniable fact that provision of water supply to people in difficult areas where water sources are scarce and existing sources are biologically and chemically contaminated requires highly specialised technical expertise.

2) Even though PHED is a very strong technical institution, it has not been able to do justice in terms of quality of water in many areas, leading to crippling and lethal diseases such as fluorosis and arsenical dermoteris (due to excess fluoride and arsenic in drinking water). The PHE Departments need reorganisation and reorientation with more focus on software activities.
3) In the light of the 73rd Constitutional Amendment, it is worth pondering upon the line of demarcation between the PRI and PHED, or rather the extent of inter linkage required between the two institutions in terms of their functions, implementation, O & M and financing of schemes.

SUMMARY

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi

Human Resource Development and Institutional Reforms for Rural Water Supply and Sanitation Sector

*Prof. I.C. Aggarwal, Ph.D.

Prologue

India is approaching the threshold of full coverage target of providing at least one safe source of drinking water to every rural habitation. This accomplishment has been possible due to the high national priority and commitment as manifested by massive sectoral investment aggregating Rs. 15,000 crores and promotion of policies encouraging creation of a huge hardware asset base. The country can be proud of having installed 2.6 million handpumps supplemented by thousands of regional and village based piped water supply systems together with defluoridation, deferrisation and desalination plants. In this process, the constraints imposed due to mammoth demographic dimension (exceeding 700 million), a wide spectrum of hydrogeological conditions and a diverse universe of socio-cultural practices had to be adequately addressed.

However,several more challenges are now emerging: over exploitation of ground water leading to drying up of increasing number of water sources; centralised, cost-intensive and inefficacious O&M threatening the sustainability of not only the drinking water sources but also of the sector and growing dimension of the adverse water quality in sources.

The sanitation sector is still struggling with poor coverage, low felt-need despite substantial awareness-building strategies and programmes being implemented for over two decades, and less-than-anticipated impact on reduction of water-borne, water-based or water-related diseases and infections.

Paradigm for Sustainable Sectoral Management

The need for (a) optimal utilisation of resources with concomitant enhanced benefits to the users and (b) effective provision of water and sanitation facilities sustained with the ultimate objective of elimination of diseases and ensuring improved quality of life is stronger than ever at the present critical juncture of programme implementation.

* *National Consultant (HRD), RGNDWM*

Impediments Hampering Sustainability

Technological	Policy	Institutional
• Poor Water Resource Management	• Supply-driven & hardware dominated approach	• Lack of multi-disciplinary professional expertise
• Inadequate water quality monitoring and surveillance	• Ambivalence and low priority for people contribution	• Insufficient capability base for rural needs and ethos
• Innovative approaches and technologies not deployed	• Tenuous cross-sectoral linkages	• Non-integration of peoples participation

These impediments can be appropriately addressed through a well-conceived and cohesive cluster of bold initiatives. This paper presents a comprehensive paradigm aimed at sustainable management of rural water supply and sanitation sector. (The key components and subcomponents of this paradigm are depicted in Fig. 1 in the main paper.)

Paradigm for Sustainable Management

Human Resource Development

(a) Grass-roots capacity build-up

(b) Capability build-up for Sector professionals

(c) Sensitisation of Strategic Apex

Institutional and Policy Reforms

Integrated Water Resource Management

Adoption of Resource-optimized and beneficiary-friendly Technologies

Human Resource Development

In the context of rural water supply and sanitation programme, HRD involves capacity and capability building of the human resources involved at five different levels as identified by the stakeholders analysis (Fig. 2. in the main paper)

National Human Resource Development Programme

Rajiv Gandhi National Drinking Water Mission, Ministry of Rural Areas & Employment, Government of India, initiated National Human Resource Development Programme (NHRDP) for rural water supply and sanitation sector in 1994 to implement the human resource development policy evolved by central and state governments.

National Human Resource Development Programme

A Snapshot

Goal

Sustainable Management of Rural Water Supply and Sanitation

Objectives

Capacity build-up at grassroots to empower people with gender specificity for facilitating active community involvement and management

Enhancement of productivity and performance of sector professionals to promote resource optimised and beneficiary-friendly technologies and managerial practices

Sensitisation of strategic apex to promote institutional and policy reforms vital for sustainability

NHRDP Goal

The Super goal of National Human Resource Development Programme is the sustainable management of the rural water supply and sanitation programme. The development of human resources especially of primary stakeholders in tandem with institutional and policy reforms, to establish enabling environment for optimal utilisation of sectoral investments with concommitant benefits to the beneficiaries are the key inputs to achieve sustainability.

NHRDP Objectives

A comprehensive analysis of objectives for sustainable management of rural water supply and sanitation was conducted based on Logical Framework Analysis (LFA), presented as Fig. 3 in the main paper. In the context of National Human Resource Development Programme, the objectives identified were :

- Capacity build-up at Grassroots Level
- Performance and Productivity Enhancement of Sector Professionals
- Sensitisation of strategic apex (policy and decision makers)
- Documentation and Dissemination of resource-optimised and beneficiary-friendly technologies for replicability
- Introduction of rural orientation in technical education courses.

Approach and Strategy for NHRDP Implementation

Major components of implementation strategy of NHRDP are :

- Devising Institutional Framework and Administrative structure for planning, implementation and monitoring of HRD activities.

- Constitution of a National Coordination Cell (HRD)
- Formation and Operationalisation of Indian Training Network.
- Establishment of HRD Cell in each state.
- Adoption of cascade mode of training for grassroots level training programme.
- Development of training resource materials.
- Networking with NGOs/VOs/CBOs and training resource institutions for extending outreach to village level for grassroots level training programme.
- Tie-up with institutes and resource persons for sector professionals' expertise build-up.
- Organisation of workshops and seminars at national level and liaison with external support agencies (ESAs).

Expected Outputs

- ***Over 600,000 Grassroots Level Trainees Trained in Focal Themes Of:***
  - Operation and maintenance of handpumps and village-based piped water supply and systems/systems components
  - Construction and repair of household latrines and other sanitation facilities
  - Motivation for Community Support Mobilisation
  - Health Education and Hygiene Promotion
  - Water Quality Surveillance
  - Water conservation and harvesting, wherever relevant.

  Realisation of this output will not only empower the beneficiaries, especially women, for sustainable community-based management of rural water supply including decentralised operation and maintenance, and generation of demand for sanitation facilities but also largely contribute to improvement in quality of life (due to lower incidence of water and excreta related diseases) and employment generation.

- ***Professionals Expertise Enhanced***

  It is expected that sector professionals would contribute significantly to reduce the adverse impacts of critical deficiencies, if their abilities, skills and knowledge are enhanced through refresher and new inservice training programmes and experience - sharing through workshops and study tours.

- ***Strategic Apex Sensitised***

  The policy and decision makers are the key stakeholders who can play dominant roles in fostering policy and work environment conducive to enhanced productivity, better resources utilisation, improved users satisfaction and sustainable management of rural water supply and sanitation programme.

- ***Networking with NGOs and Resource Institutions Developed and Sustained***

  To have substantial required impacts, agencies operating outside the system are to be associated with programme implementation through networking.

O&M & NHRDP : Madhya Pradesh Experiment

The grassroots capacity build-up component of NHRDP addresses and impacts the sustainability of O&M by empowering the people with gender specificity through AIM. The acronym AIM was coined to capture the quintessence of grassroots capacity build-up subprogramme.

AIM OF GRASSROOTS TRAINING PROGRAMME

A	—	***Awareness about participatory approach***
I	—	***Involvement through community management***
M	—	***Maintenance & Operational skill development***

Situation Analysis

According to an All India Survey (1991-94) conducted by state and central governments, around 13% of the spot water sources were defunct for a variety of reasons. The number of defunct and non-functional and hence non-usable water sources at any given point in time could be much higher due to temporary breakdowns and seasonal drying up of water sources. The chief contributory constraints hampering efficacious O&M are:

- Centralised O&M by Implementing Departments
- Lack of Universal Adoption of Preventive Maintenance
- Break-Down Repair Driven O&M System
- Mounting O&M Costs

Decentralised Operation & Maintenance System

To overcome several shortcomings in the existing Operation & Maintenance Systems, the Government of India has issued guidelines for operationalisation of Two-tier System comprising of a maintenance crew at the block level covering about 250 handpumps and a self-employed mechanic (SEM) at the village level with 20-25 handpumps within his working domain.

This decentralised system can truly be designated as Community - Supported and Managed O&M system (COSMOS). The key concept here is the introduction of a self-employed mechanic who is a community member and is supported by and responsible to the community through a beneficiary group in the form of a Water User Committee. Therefore the National Human Resource Development Programm (NHRDP) focuses on training of a community member to become a self-employed mechanic in addition to training a motivator for community support mobilisation and a health education and hygiene promoter. Together, this core group of three trained community members will contribute significantly to a sustainable decentralised O&M system.

Madhya Pradesh Experience

The implementation of decentralised O&M system for Rural Water Supply in the state of Madhya Pradesh actively facilitated by capacity build-up amongst community through operationalisation of grassroot level training programme is an interesting example. The State has recently (August 1995) entrusted the responsibility of owning and maintaining the water supply systems to the Panchayati Raj Institutions as a follow up of the provisions of the 73rd Amendment to the Constitution.

The grassroot training programme for capacity building was entrusted by the Government of India to Technical Teachers Training Institute, (T.T.T.I.) Bhopal, duly supported by the HRD Cell established in the Public Health Engineering Department of the State under the charge of a Chief Engineer. The TTTI, in association with National Consultant (HRD) conceptualized the strategic framework and evolved an implementing strategy which involved the following major activities :

(i) Formal meeting with District Collector and Zila Panchayat President of the concerned district for explaining the project objectives and methodologies.

(ii) Organisation of Press conference in the district giving the salient features of the project.

(iii) Holding of Sarpanch Sammelan (Conference of Village Panchayat Heads) in the district to be attended by Zila Panchayat President, District Collector, Chief Engineer PHED or Executive Engineer, Block Panchayat Members, Sarpanchs, media persons, Community Polytechnic functionaries and Panchayat Offices.

(iv) The basic purpose of this Sarpanch Sammelan was to involve the key stake-holders in the district including Sarpanchs in the implementation of the Grassroots level training programme through participatory approach.

(v) Conduct of training programmes for self-employed mechanics and other trainees from the villages.

In a period of less than a year, more than 8,000 trainees have been trained and there is an all round appreciation of this joint venture involving community, Panchayati Raj Institutions, District Administrators, Public Health Engineering Department and the Govt. of India.

It is hoped that the Madhya Pradesh experiment would be successfully replicated with appropriate modifications, if required, in other States also. For this replicability, the Government of India has planned to conduct 4 regional workshops for experience sharing and to operationalise Grassroots level training programme in the four regions of the country. One regional workshop has already been successfully conducted for the southern region.

Institutional & Policy Reforms

Often, the programme is piloted to achieve fulfillment of stipulated quantitative physical and financial targets rather than being focused on attainment of desired impact on beneficiaries. To facilitate programme paradigm shift to sustainable management, institutions and policies need directional orientation. Policy reforms should promote financial and system viability by encouraging cost-sharing and management by community and beneficiary.

Functional roles

Several functional roles have emerged or require greater emphasis, if sustainability is to be achieved.

- Integrated Water Resource Management including upgradation and innovation of traditional sources and low cost water harvesting.
- Water Quality Monitoring, Surveillance and Management.
- Scientific Source Finding.
- Monitoring and Impact Analysis.
- Human Resource Development.
- Research and Development.
- Management.
- Social Engineering and Community participation.

Institutional Reforms

Traditionally, the implementing agencies have been dominated by engineering expertise. However, to effectively carry out emerging or refocused functional roles, several reforms aimed at reorienting orgainsational structure are called for.

Policy Reforms

Major fulcrums for Policy reforms could be:

- Government's role to change from being PROVIDER to being FACILIATOR
- Quantum jump for software activities with special boost to capacity building
- Programme to be people-centered "For the people, of the people and by the people."

HUMAN RESOURCES DEVELOPMENT

FOR THE

TWO-TIER HANDPUMP MAINTENANCE SYSTEM

IN THE

STATE OF ORISSA, INDIA

by
J. Bjerre, L.V.R. Reddy, and C.P.M. de Groot

ed for the

Workshop
on
Operation and Maintenance of Rural Water Supply and Sanitation Systems
New Delhi, September 25-27, 1996

HUMAN RESOURCES DEVELOPMENT
FOR THE
TWO-TIER HANDPUMP MAINTENANCE SYSTEM
IN THE
STATE OF ORISSA, INDIA[1]

by
J. Bjerre[2], L.V.R. Reddy[3], and C.P.M. de Groot[4]

1. INTRODUCTION/BACKGROUND

To achieve the goal of access to potable water to all, the Government of Orissa has, like most other states in India, adopted tubewells with hand pumps as a primary means of drinking water supply.

Further, in order to address the need for regular and reliable maintenance of these handpumps, the Government of Orissa initially introduced a three-tier maintenance system depending on voluntary village level caretakers (VLCs) at the water point level, and block level mechanics and a mobile maintenance team (MMTs) with a van at district level. This three-tier system, which was first introduced in 1978 and is still in operation in 296 blocks of the state, has not, however, yielded the desired results. On one hand, most of the VLCs have been neglecting and/or completely abandoned their (preventive) maintenance work, while on the other, the capacity and number of block level MMTs has also not been sufficient to cope with both the preventive and curative maintenance tasks and responsibilities entrusted to them.

It was against this background that the Danida-assisted Drinking Water Supply Project in Orissa, soon after its start in 1985, initiated a R&D programme in 1986 with the main aim to develop and introduce an alternative, two-tier maintenance system. In this system a village based "Self Employed Mechanic", trained and equipped to maintain/repair about 20-25 handpumps, constituted the first tier, while a block level Junior Engineer, supported by a 3-member crew, constituted the second.

The R&D activities started in 1986, covering 3 blocks in coastal Orissa initially. The scope of the maintenance system, also known as the "Two-tier Self Employed Mechanics (SEM) System", was further extended during the years 1987 (5 blocks), 1990 (4 blocks) and 1993 (6 blocks). By the end of the Project (December 1993), the system covered a total of 7,300 handpumps in 18 blocks involving some 330 self-employed mechanics and 2,800 user committees.

Based on internal and external evaluations of the two-tier maintenance system in 1992-93, it was concluded that the system was decidedly more efficient and economical than the three-tier system, which prompted the participants of a State Level Workshop on Handpump Maintenance in July 1993 to recommend that the system should be adopted/introduced on a wider scale. However, it was also recognized, in particular during the National Level Workshop in August 1993, that the system in its current form continued to be a "centrally, government-managed system", and that further decentralisation of the system would be required, seeking, among others, the active involvement of Gram Panchayats.

With the aim to further develop the two-tier maintenance system, and bearing in mind the recommendations made by the state and national level workshop participants in July resp. August 1993, the Rural Development Department of the Government of Orissa (GOO) prepared a project proposal for establishment of a community-managed handpump maintenance system in the State of Orissa. The proposal, which was presented to Danida in late 1994, has been appraised by a team of experts in early 1996 and the first draft of the Project Document is expected soon.

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1 Paper prepared for the National Workshop on Operation and Maintenance in Rural Water Supply and Sanitation Sytems, New Delhi, September 25-27, 1996,

2 Counsellor Development, Royal Danish Embassy, New Delhi

3 Maintenance Adviser, Danida-assisted Rural Drinking Water Supply Project in Orissa (until 1994); currently working as a Sr. Hydrogeological Adviser, PAG/Danida, Danida-assisted IRS&WS Project in Karnataka.

4 Public Health Engineering Adviser, PAG/Danida, Danida-assisted IRS&WS Project, Karnataka

2. TWO-TIER MAINTENANCE SYSTEM IN ORISSA - A CASE STUDY[5]

2.1 BACKGROUND/OBJECTIVES

By initiating the R&D on handpump maintenance in 1986, the Danida-assisted Rural Drinking Water Supply Project wanted to address/resolve a number of constraints and problems experienced/observed in the existing three-tier maintenance system. Of these, the following were considered particularly critical:-

- the ineffective role and/or near-absence of the (voluntary) handpump caretakers;
- poor monitoring, logistical problems and high transport cost related to remoteness of villages/handpumps from district and block headquarters;
- long response times due to overloaded/overburdened mobile maintenance crews/vans;
- undue need for, and/or focus on, break-down repair with little time and resources reserved for preventive maintenance; and
- limited (motivation for) community involvement/participation due to the adoption of highly centralized, government-managed maintenance system(s).

In addition, it was hoped that the R&D activities would lead to the development of a maintenance system which would be more conducive to active private sector participation, e.g., in the manufacture, distribution and supply of handpump tools and spare parts.

2.2 OVERALL APPROACH/STRATEGY

From the start of the R&D programme in 1986, the implementation strategy for the two-tier maintenance system was to:-

- identify, train and equip village-based artisans in handpump maintenance to act as the first tier of a decentralised village based handpump maintenance system;
- provide these village-based artisans, or "Self Employed Mechanics (SEMs)", with adequate infrastructural support through a second tier consisting of a Junior Engineer and a Handpump Maintenance Crew;
- institute preventive maintenance through monthly visits to all the pumps by the SEMs; and
- attempt to make handpump maintenance into an accepted rural trade in which SEMs would be paid fees for rendering preventive maintenance and repair services to handpumps.

While established as a special research activity in three coastal blocks of Orissa initially (in 1986), the system was gradually transferred into a regular project activity from 1990. By the end of the project in December 1993, the system covered some 7,300 handpumps in a total of 18 blocks.

2.3 INSTITUTIONAL SETTING/FRAMEWORK

Though overall responsibility for the project was with the State Public Health Engineering Department (PHED) and, later on, with the Rural Water Supply and Sanitation Department (RWSS) under the Rural Development Department (RDP), day-to-day project management and implementation was delegated to a specially created Danida Project Directorate (DPD). The DPD consisted of a planning and monitoring division (PMD), and special divisions for design (DD), for source establishment (WRD), for socio-economic "soft-ware" inputs/interventions (SED), and for handpump maintenance (MD).

At block level, the project depended on SED/Field Officers for socio-economic surveys, well siting, selection and orientation/training of village-based SEMs, and for the formation and monitoring of user groups/committees, while source establishment and pump installation were carried out by four exclusive Project Field Divisions (FDs, each covering between 5-10 blocks). As mentioned earlier, handpump installations, after having been handed over to the MD, depended on village-based SEMs with the support of

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[5] Based on experiences with the Danida-assisted Rural Drinking Water Supply Project (1985-1993)

block-level Junior Engineers (JE-M) and a maintenance crew, for maintenance. During the project consolidation phase in 1993, with the phasing out of the Project (including abolishment of the MD), both the maintenance crews and the JE-M's specific maintenance responsibilities were fully absorbed by the 'regular' RWSS Divisions.

In 1993, with the extension of the maintenance system to another 6 blocks, the project started to actively involve NGOs to undertake a major portion of the socio-economic "soft-ware" activities which, until then, had been carried out by the SED/Field Officers. It was with the help of these NGOs, that the formation and monitoring of user groups and committees for each of the handpump installations became a more common feature of the project.

2.4 SELF EMPLOYED MECHANICS (SEMs)

The Self Employed Mechanics (SEMs) were local craftsmen, generally blacksmiths or cycle mechanics, identified and selected by the SED (and later also by NGOs). Selection of SEMs was based on considerations such as the candidates' background and social standing in their own communities, their existing work-loads, their willingness to undertake handpump maintenance as a subsidiary economic activity, and their physical fitness.

Upon successful completion of training by the project (in 2 stages), each SEM was given a contract, specifying his duties and the list of pumps under his care. At this stage he was also be given a bicycle, all necessary tools and some spare parts. Each SEM was expected to cover about 20-25 handpumps in some 4-5 villages and received, upon recommendation by the JE-M, a monthly payment into his personal bank account which was calculated on the basis of a total 'fee' of Rs.120/= per handpump per year. While initially, these payments were made through the *JE-M/MD and the project's funding channels directly, the responsibility for SEM* payment was shifted to the 'regular' RWSS Divisions later on (i.e., from 1993).

The SEM's duties included monthly preventive maintenance visits to every pump and attending to additional repair requests made by the villagers through the existing -informal- communication systems/channels. In case of major, below ground, repairs, the SEMs were expected to assist each other on a reciprocal/voluntary basis. The SEMs were also expected to prepare and maintain records, logs and relevant indents required, not only to facilitate continued and effective flow of funds and spare parts, but also for overall monitoring of handpump performance and water quality.

2.5 USER GROUPS/COMMITTEES

Though the project had gained some experience with handpump-based user groups in the experimental phase of the project (i.e., while introducing the maintenance system in the first three blocks), it was only in the consolidation phase (during 1993) that the project decided to form and monitor user groups for every single installation. Through the efforts of the SED, and with the assistance of six NGOs (one in each block), some 2200 user groups were formed in the last six blocks covered by the project, alone.

These user groups comprised of 5 men and women, normally, and were formed through consensus among the actual users of each handpump. The groups, which had an informal (unregistered) character, would be responsible for activities such as: informing the SEM about maintenance/repair needs; assist the SEM in his work/activities; assist the project in monitoring the SEM's performance; and maintain, and/or motivate the community to maintain, a clean environment/clean surroundings around the installations.

2.6 BLOCK-LEVEL JUNIOR ENGINEER/MAINTENANCE CREW

Block level Junior Engineers were assigned the task to oversee the maintenance of some 500-700 handpumps, including the supervision and monitoring of the work of some 25-30 SEMs. Each JE-M was further expected to conduct monthly meetings with SEMs, arrange for supply of spare parts (initially through the 'exclusive' project MD and FDs, and later through the 'regular' RWSS Divisions), and -with the help of a maintenance crew- provide technical assistance to SEMs in case of complicated repairs.

2.7 SOCIO-ECONOMIC (SED) & MAINTENANCE DIVISIONS (MD)

As indicated earlier, separate Socio-Economic and Maintenance Divisions were created under the Danida Project Directorate (itself 'exclusive'). While the SED played a crucial role in all "soft-ware" activities related to, for instance, site selection, selection and training of SEMs and user groups, and involvement of NGOs, the MD was responsible for all remaining -often more technical- activities related to the two-tier maintenance system, including supervision and monitoring of ('exclusive') JE-Ms, monitoring of handpump performance, and procurement and distribution of spare parts. In addition, both Divisions played critical roles in a range of related support activities such as training and orientation and the development of work/monitoring schedules, practical guidelines and manuals, job descriptions, training programmes, etc.

During the consolidation phase of the project in 1993, with the phasing out of the above 'exclusive' project organization, the RWSS managed to take over and/or incorporate a major portion of the technical "hard-ware" responsibilities in the existing state and block level institutions, including the continued monitoring of, and financial and technical support to the SEMs responsible for maintenance. However, this has not been the case as far as the SED activities were concerned, and it has become clear over the recent years that unless this type of "soft-ware" support is built in the government structure, it will be very difficult, not only to extend the maintenance system to the whole state, but even, to sustain the system in the 18 blocks covered so far.

2.8 FINANCING REPAIR AND MAINTENANCE/COST SHARING

During the internal and external evaluations carried out in 1992-93, it was found, not only that the two-tier maintenance system was more effective than the 'traditional' three-tier system, but that -in the long run- it would also be more economical, in particular when the responsibility for handpump maintenance would be further decentralized and transferred to the Gram Panchayats (i.e., instead of the JE/FDs).

(1992 prices)	Two-tier "SEM" System	Three-tier System
Annual Cost for Spare Parts only	Rs.116/=	Rs.177/=
Annual Cost when Gram Panchayat Managed	Rs.350/=	Rs.500/=
Annual Cost when Centrally (Project) Managed	Rs.975/=	Rs.858/=

As shown in above table, it was estimated that, where a decentralized, Gram Panchayat-managed two-tier maintenance system would be in operation, the annual per-installation-cost would work out to about Rs.350/=, including Rs.116/= for spare parts, Rs.120/= for the SEM, Rs.60/= to pay the GP Secretary's honorarium and Rs.54/= towards other "sundry" expenses (at 1992 prices).

With regard to cost-sharing towards maintenance cost, the project authorities, for most of the project period, followed the prevailing GOO philosophy that the Government had full responsibility for water supply. Besides, with all technical, administrative and even legal responsibility lying with the GOO (with RWSS, for instance, claiming full ownership of the facilities), there has -in the past- generally been no incentive/basis for communities to assume full or even partial responsibility for financing preventive and/or curative maintenance of the handpumps, or -as was demonstrated in two blocks were the project managed to collect an average of about Rs.5/= from each household- for the RWSS engineers to accept and/or utilize community contributions.

2.9 SUSTAINABILITY OF THE TWO-TIER MAINTENANCE SYSTEM

While it has been possible for the GOO/RWSS to -technically- sustain the two-tier maintenance system introduced in the 18 blocks covered by the project during the period 1985-1993, it is clear that the overall sustainability of the maintenance system will depend, not only on Danida's continued support to extent the system to the rest of the state (though up-scaling is certainly a critical factor), but also on a number of other critical government-controlled activities and/or developments, such as: (1) the further delegation and decentralization of maintenance responsibility to the Gram Panchayats/Communities; and (2) the establishment and/or strengthening of adequate "soft-ware" capacity and HRD support through, for instance, the recently established state, district and block level RWSS/HRD cells, the State Institute for Rural Development (SIRD) and/or through more active and wide-spread NGO involvement.

3. THE FUTURE

3.1 PROBLEMS/ISSUES TO BE ADDRESSED

As mentioned earlier, the Rural Development Department of the Government of Orissa (GOO) prepared a project proposal for establishment of a community-managed handpump maintenance system in the State of Orissa. The proposal, which was presented to Danida in late 1994, has been appraised by a team of experts in early 1996, and the first draft of the Project Document is expected soon.

While the project proposal touches upon a wide range of issues and problems, the general perception is that the following (categories of) basic problems are particularly relevant to the rural drinking water supply sector in Orissa:-

i. a range of -basically technical- problems caused by poor ground water quality, sub-standard source establishment and handpump installation, and inadequate preventive and curative maintenance; and

ii. a low level of user involvement and responsibility resulting, not only in poor user participation in overall (preventive) maintenance of handpumps and their surroundings, but also in a continued high burden on, already stretched, government resources.

3.2 PROPOSED GENERAL APPROACH - SALIENT FEATURES

While addressing the above problems and in order to ensure that the large-scale introduction of the proposed two-tier maintenance system will be both effective and sustainable, it has been suggested that the project would have to adopt a strategy based on the following two keywords, i.e., (1) *decentralization*, and (2) *community management*. In summary, the strategy envisages, even prescribes, that:-

- all (also technical) decisions on new handpump installations and O&M requirements should be transferred from the RWSS to the Gram Panchayats and User Groups. RWSS should have/assume technical advisory role/responsibility only;

- formal ownership and management responsibility for handpumps should be transferred to the Gram Panchayats. This does also imply that Gram Panchayats, with local SEMs as key functionaries, shall bear full responsibility for planning, financing, implementing and monitoring handpump maintenance, including water quality monitoring, flow of spare parts, etc.; and

- user responsibility will be increased through the formation of user groups and introduction of financial beneficiary contributions.

3.3 HUMAN RESOURCES DEVELOPMENT (HRD) - CHALLENGES AND OPPORTUNITIES

Though the afore-presented strategy appears logical and is fully in line also with the current policies/guidelines[6] related to handpump rehabilitation, rejuvenation and maintenance, it is clear that the transition from the current, centrally-managed, to the future Gram Panchayat-managed water supply and maintenance system will take considerable time. Moreover, such transition will only be possible if and when the Gram Panchayats/Communities will be equipped with the required capacity and capabilities to assume all those responsibilities (to be) delegated to them.

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[6] As presented in GOI/RGNDWM Circular on "Operation and Maintenance of Water Supply Schemes, Particularly Handpumps and Standposts in Rural Areas" (No.W-11012/9/94-TM-li, dt 14.12.94)

Based on the experiences in the earlier Danida-assisted Rural Water Supply Project, and in the context of both the extension (up-scaling) and de-centralization of the two-tier "SEM" handpump maintenance system as currently envisaged by the GOO, the following set of questions and/or issues appears to be particularly relevant:-

- how to ensure that Gram Panchayats (with SEMs) will have -and will continue to have- the required (management) skills, orientation and motivation to assume many of the second tier responsibilities such as spare part procurement and distribution, SEM monitoring, supervision and payment, water quality monitoring, etc., all of which are still with the centrally-managed RWSS Divisions; and

- in the absence of the former SED and MD, whom to give responsibilities, not only (for helping) to ensure the above, basic management capacities, but also to plan and facilitate a wide range of other critical "soft-ware" activities such as: (1) identification, selection and training of SEMs and GP members/secretaries; (2) design and implementation of refresher courses for these functionaries, for instance, following changes/developments in handpump technology; (3) promoting and facilitating beneficiary site selection and handpump rehabilitation and rejuvenation as integral components of the maintenance programme; (4) development, translation and distribution of relevant IEC materials, guidelines and manuals; and (5) promoting and facilitating active and effective NGO involvement in sector activities such as user group formation, SEM monitoring, etc.

As it is, any effort to up-scale and/or de-centralize the handpump maintenance system would generally have to rely on the following, existing "software" (including HRD) capacity in the State of Orissa: (1) the recently established HRD Cell in the RWSS Department for specific, though mostly technical, training and orientation of, for instance, the SEMs and Gram Panchayat Members; (2) the State Institute for Rural Development (SIRD) for general improvement of administrative/management capabilities of selected Gram Panchayat functionaries; and (3) selected Non-Government and Voluntary Organizations who have experiences in -or could be trained to take up- some of the project's support activities.

While the assumption may be that the (combination of) this type of existing institutions, possibly with the support of externally-assisted project(s) such as the one currently presented to Danida, should be able to take up many of the critical HRD-related and other Gram Panchayat/Community based project support activities, it is also clear that such an assumption will only hold true if and when the State Government will succeed to:-

- first promote and facilitate adequate HRD/Capacity Building in the institutions themselves, not only by simply organizing "training-of-trainers" programmes, but also, for instance, by: ensuring a proper 'mix' of both "hard" and "soft-ware" staff and responsibilities (esp. in the RWSS/HRD Cell); providing adequate job-descriptions, incentives and career development perspectives for all the staff/trainers; facilitating the development and use of appropriate (training) manuals and guidelines; and promoting the design and formation of effective, preferably de-centralized organizational structures within the existing institutions; and

- establish appropriate linkages between, and coordination/integration of, the different activities to be carried out by these institutions. This, for instance, would help to ensure that specific "technical" training activities by the HRD cell would be combined with appropriate "soft-ware" orientation programmes by an NGO and/or necessary "management" training by the SIRD.

Though the above task(s) may seem enormous, it may be good to end this paper with a reminder of how the situation was (only) ten years ago, when, in 1985, the then Danida-assisted Rural Water Supply Project did have no other option than to implement the project through a non-sustainable, 'exclusive' and highly centralized project organization, with only very limited expectations from the community in terms of involvement and participation, let alone in 'complete' system management.

Today, the growing political commitment and increasing institutional support for decentralization -though weak it may yet be- do present the rural water supply and sanitation sector with a whole set of new opportunities to overcome some of the above mentioned problems/challenges, and to aim at achieving its objectives, including the establishment of adequate, reliable and also sustainable community-managed water supply services for the rural population.

REFERENCES

- Raj Kumar Daw, Two-tier Maintenance System for Handpumps in the Danida Assisted Orissa Rural Drinking Water Supply Project, Danida Project Directorate, Bhubaneswar, Orissa, May 1992

- A Report on the (External) Evaluation of Handpump Maintenance Systems in the Coastal Districts of Orissa, New Delhi, May 1992

- A Report on the Internal Evaluation of the Two-tier Handpump Maintenance System of the Orissa Drinking Water Supply Project, Danida Project Directorate, Bhubaneswar, June 1993

- Report on the State Level Workshop on Handpump Maintenance in Orissa from 16-17 July 1993 in Bhubaneswar, Rural Development Department, Government of Orissa, July 1993

- Report on the National Workshop on Handpump Maintenance from 19-20 August 1993 at Toshali Sands, Puri; Rural Development Department, Government of Orissa, September 1993

- L.V.R. Reddy, Concept Paper for Handpump Maintenance, Bhubaneswar, 1994

- Project Proposal for Establishment of Community Managed Handpump Maintenance System in the State of Orissa, Rural Development Department, Government of Orissa, August 1994

- GOI/RGNDMW Guidelines related to the Operation and Maintenance of Water Supply Schemes, Particularly Handpumps and Standpost in Rural Areas (No. W-11012/4/94-TM-li, dt. 14/12/94)

- L.V.R. Reddy, Danida Assisted Community-Based Operation and Maintenance Project in Orissa - Preparation Experiences; paper presented at the National Workshop on ESA Assisted Rural Water Supply and Environmental Sanitation Projects in India, Cochin, March 1995

- Ashok Jaitly and Raj Kumar Daw, Contribution of Voluntary Organisations in Rural Drinking Water Supply and Sanitation Programmes in India; paper presented at the Coordination Council Meeting at Barbados in September 1995.

~~Summary~~

NATIONAL WORKSHOP

Operation and Maintenance of Rural Water Supply and Sanitation Systems

25-27 September 1996

New Delhi

Information, Education & Communication (IEC) for the O&M of Rural Water Supply Systems in India

Jagmeet Uppal

India has the largest rural water supply programme in the world with the target of providing access to safe drinking water for about 700 million people — and that too, free of cost. The major source of drinking water in the rural areas of the country is ground water, supplied through over 2.6 million handpumps. Out of over 1.3 million habitations in the country, access to safe drinking water sources have been provided to all except about 75,000 habitations covering about 3 per cent of the rural population. This un-reached population will also be covered soon with an ambitious programme of the Government.

With this massive coverage, the country should not suffer from water scarcity, and yet only around three lakh habitations receive less than 40 litres per capita per day, in accordance with the prescribed norms of the Government of India. It has been estimated that at any given time, about 1/3 of handpumps or other water supply systems remain unoperational.

A hardware oriented movement with target approach for providing drinking water was launched in the country with the setting-up of National Drinking Water Mission. The main objective was to provide access and cover all problem villages with a safe drinking water source. No frame work was created to involve the community at any point of time, either before executing the scheme or after. The thrust continued to remain on creation of new sources, without finding solutions to the problem of sustainability and Operation & Maintenance of the sources.In the last few years, the issue of sustainability and O&M has come into the forefront due to involvement of local elected bodies (Panchayats) in this sector. The entire programme of the Rural Water Supply is based on "supply driven approach", with 100% subsidy. Now, the responsibility of making the water supply systems sustainable lies with the Panchayats and the people, who were not involved at any point of time while planning and executing the programme. As a consequence, Panchayats are now facing the problems of :-

i) Insufficient funds of O&M

ii) No trained manpower at community level

iii) No felt need for community participation due to supply driven approach

iv) Lack of general awareness on water related issues and on Hygiene Education.

v) User's unwillingness to pay.

Under the 73rd Constitutional Amendment, some states have started decentralising Operation & Maintenance, hoping to achieve success in this area through Gram Panchayats. But "Decentralise

* *Consultant (IEC), (RGNDW)*

O&M" is not the same as community based O&M. The latter includes community contribution to the O&M cost and community involvement in planning and management of water sources. This imparts a sense of ownership of the water sources to the community — an essential element in sustainability of the source.

IEC Strategy

The Rajiv Gandhi National Drinking Water Mission, under the Ministry of Rural Areas & Employment, Government of India has prepared an IEC strategy for creating awareness in the water and sanitation sector on issues related with ownership, O&M, sustainability, cost sharing, cost recovery, community participation, involvement of local institution, hygiene education etc. The strategy will be implemented in the 65 districts of the country from the end of this year and all the districts of the country will be covered in the next 4-5 years under the "Intensive Awareness Campaign".

The goal of the strategy is to institutionalise all water and sanitation related issues pertaining to permanent behavioural change, to be passed on from generation to generation within the community as any other social custom.

In order to make community participation sustainable, it is planned to give importance to four aspects - decision making, implementation, monitoring and evaluation. The ultimate aim is to achieve the goal by persuading the community to opt for "Community Managed" systems, rather than systems based on "Community Involvement" and "Community Participation".

Under the National IEC strategy of the Mission, in the first stage, women who are the most closely involved with water, will be animators/motivators at the community level to generate commitment within the community for Operation & Maintenance of the systems. "Community Involvement" and "Community Participation" will be key to the success of the first stage of the awareness campaign.

The awareness campaign can only be successful if proper attention is paid to the programme communication by identifying specific groups and developing a particular strategy, messages for each group using various channels such as inter-personal communication, folk media, electronic, printing and mass media. The partnership (for the joint ownership of the programme and its activities) among the Panchayats, NGOs, users, implementors, motivators and inter-sectoral departments has also been given equal importance in the awareness strategy.

For an effective and sustainable water supply system with special emphasis on Operation & Maintenance, a step by step approach through awareness building is recommended. The emphasis can be on:-

a) Assessment of O&M needs and constraints.

b) Common understanding among the users for Operation & Maintenance problems.

c) Identification of roles and functionaries in O&M.

d) Identification of strategies and planning to ensure O&M on asustained basis.

e) To learn from neighbouring communities.

f) Develop and execute individual & group action plan.

g) Develop indicators to monitor O&M and evaluate the weak and strong points through action and analysis process.

'Community participation' is the key to problems, but the best solution is "community management". Systems which come under the latter category are more dependent, reliable and sustainable than systems under any other category.

OF FLOWS AND FLUSH

Resources Development in the GoI/GoN Cooperation Programme for Rural Water Supply and Sanitation

Synthesis paper presented at the National Workshop on Operation and Maintenance of Rural Water Supply and Sanitation Systems,

New Delhi, 25-27 September 1996

With contributions from

Dr. K. Balachandra Kurup, Dr. J. De, Mr. S. Gussenhoven, Ms. A. Hoogenboom, Shri Teeka Ram Meena, Mr. Rob Trietsch, Shri B.J. Vasavada, Mr. R. Wijdemans and Ms. C. van Wijk

September 1996

Resources development in the GoI/GoN cooperation programme for rural water supply and sanitation

Synthesis paper presented at the National Workshop on Operation and Maintenance of Rural Water Supply and Sanitation Systems, New Delhi, 25-27 September 1996

1. Introduction

This paper is a synthesis of the contributions from the GoI-GoN cooperation programme on rural water supply and sanitation in five Indian states[1]. The programme is implemented under an agreement on financial cooperation between the Governments of India and the Netherlands. The purpose of the paper is to give an overview of O&M experiences on rural water supply and sanitation in the programme, link these experiences to more general O&M related sector problems in India and formulate some general conclusions and recommendations. On request of GoI special attention is paid to resources development for O&M. Separate papers are available related to the GoI-GoN RWSS programmes in Gujarat, Kerala and Uttar Pradesh[2].

2. O&M crucial for effective public health engineering

Proper operation and maintenance of improved rural water supply and sanitation form the testcase for the adequacy and results of public health engineering. Human history shows us how important the presence and good performance of improved drinking water supply and sanitation systems has been. All great city civilizations already had well-functioning water supply and sanitation systems, as illustrated in Box 1. The box also shows that in Northern Europe, improved water supply and sanitation systems emerged much later than in the South East, such as Mesopotamia, the Indus region, and, not mentioned in the box, China and Egypt.

[1] Contributions to this paper originate from, in alphabetical order, Dr. K. Balachandran Kurup (SEUF, Kerala), Dr. J. De (PSUF, Uttar Pradesh), Netherland' Assisted Project Office (Andhra Pradesh), Shri Teeka Ram Meena (Dept. of Water Supply and Irrigation, Government of Kerala), Shri B.J. Vasavada (GWSSB, Gujarat), Ms. C. van Wijk (IRC, The Netherlands) and members of the Support Missions to the respective projects.

[2] See the papers of Mr. Vasavada, the SEUF and the PSUF.

Box 1 **How crucial are good O&M of water supply and sanitation systems?**

Some data from history's great civilizations

4000 BC Sumerian civilization has written laws on water and water use

3000 BC Indus valley civilization has a rudimentary piped water supply and sewerage system and grows in size and importance. Other peoples are incorporated, laying the basis for the caste system

600 BC Roman civilization has underground channels for drainage and water supply. Well functioning aquaducts supply water throughout the empire. The city of Rome has a central storm drain and sewer, the Cloaca Maxima, private toilets and 114 public toilets.

-900 AD Mediterranean populations suffer epidemics due to contaminated drinking water. Germanic people, Vikings not affected; grow in numbers and invade Britain, Rhine and Danube lands.

1531 AD Britain adopts bill of sewers in London.

1596 AD First report on standpipe service in England.

1775 AD First patent for water closet (Mr. Cummings).

1791 AD First water treatment plant (SSF) in Scotland.

1770 AD French army adopts sanitary reforms and prevents epidemics among soldiers.

1832, 1848 AD Cholera outbreaks in Britain lead to general adoption of improved water supplies and sewerage systems.

1892 AD Cholera epidemic in Hamburg, Germany, from supplying poor quality drinking water from river Elbe; neighbouring city of Altona uses same water, but treated and has no cholera cases.

Sources: McNeill, W.H. Plagues and Peoples, London 1976; Kalbermatten, J. and M. G. McGarry. Beyond the Decade. Paper presented at the International Drinking Water Supply and Sanitation Consultation, Interlaken, October 13-16, 1987

All through history, adequately working and generally used water supplies and sanitation systems have been primary conditions for better hygiene, and so better health and socio-economic development.

3. Capacity development for O&M under GoI-GoN cooperation

Bilateral cooperation of GoI and GoN in rural water supply began in 1978 in Andhra Pradesh and Uttar Pradesh. Since then, three other states have joined: Gujarat, Kerala and Karnataka. The programme was also expanded with community participation, sanitation, hygiene promotion and training.

Several types of rural water supply systems have been and are being installed: comprehensive rural water supply schemes in Andhra Pradesh, Gujarat, Kerala and Uttar Pradesh; single/small village piped schemes in Karnataka; handpump wells in Uttar Pradesh; spring caption in Kerala. Sanitation systems may comprise: household latrines; soakpits in households and/or at public water points; school latrine blocks and taps/cisterns; village stormwater drains; and improvement of general environmental hygiene. Table 1 shows that under the GoI-GoN cooperation programme some 146 piped water supplies and over 26,000 handpumps are presently operational in some 6,000 villages. The overall design population is around 1 crore or 10 million people. In addition, 527 springs have been converted into protected community water supplies in Kerala.

Table 1 No. of completed rural water supply systems according to type, number of villages covered and design populations

State *)	No. of piped schemes	No. of handpumps	No. of villages covered	Size of design population **)
Andhra Pradesh	99	-	478	14,10260
Gujarat	3	-	301	6,90000
Kerala	8	-	43	19,75000
Uttar Pradesh	36	-	5107	55,81569
Total	146	26,711	5929	96,56829

*) In the Karnataka programme tenders are under evaluation for schemes to 34 villages with a design population of nearly 100,000 people.

**) For handpump schemes the current population applies.

Furthermore, almost 60,000 household latrines are operational. These are found mainly in Kerala (44,650) and Uttar Pradesh (14,101). Improved school latrines are operational in Kerala and Uttar Pradesh (48 latrine blocks with taps and cisterns). In Gujarat latrines have been completed in 2 villages; in Karnataka 214 latrines are operational and 346 under construction; in Andhra Pradesh the first latrines have been installed under a revised programme, following an unsuccessful earlier programme.

Capacity development for O&M of integrated rural water supply and sanitation systems takes place on-the-job, through special O&M projects and experiments and through training. Training takes place in programme workshops and courses set up to develop particular knowledge and skills, e.g. on water treatment systems and on operation of piped water supply systems.

Each year a group of 6 professionals (engineers, social and health specialists) takes part in the Management for Sustainability Course in the Netherlands. The course covers the technical, social, financial and managerial issues involved in the sustainability of rural water supplies and sanitation programmes.

Another group of 6 engineers takes part in the post-graduate course on environmental health engineering at IHE in Delft. This course includes a 6 weeks programme on low cost water supply and sanitation. The curriculum covers technical, social and managerial aspects. Practical work involves the development of an integrated RWSS plan for an imaginary district, whereby the team compare various technical and organizational options and finally work out the option that is financially, technically, socially and organizationally most viable. Participants in both courses are predominantly male.

At the end of each IHE course, the best graduates are invited for an additional MSc programme. This involves also field research in the student's home area. Two MSc theses had the performance of community managed water supplies as their subject, one in UP and one in Gujarat.

Reformulation of a project to transfer these courses to Indian education and training institutions is foreseen for 1997. In cooperation with IHE, IRC and MDF state-level Indian training institutes and NGOs will set up region-specific training courses on planning and management aspects of integrated rural water supply and sanitation projects. Further foreseen is the development of a post-graduate and multi-disciplinary course on environmental health engineering as part of the national programme for academic education.

Specific capacity building issues addressed as part of implementation under the GoI-GoN cooperation programme are: O&M aspects of project designs; O&M organization; development of O&M procedures and manuals; financing of recurrent costs; and setting up monitoring systems for the performance of the water supplies and the maintenance and use of the sanitation systems.

a) O&M and project design

Preparation for O&M of piped rural water supply in the GoI-GoN cooperation programme starts at the inception phase. In some of the more recent projects, planning involves choosing a combination of technologies, with smaller, decentralized schemes where these are possible, the assessment of the feasibility of O&M and the planning of an O&M strategy. The technology choice of large schemes is recently assessed in a special appraisal, which includes O&M feasibility.

In Kerala, technologies also includes improvement of traditional water systems: spring caption in the hilly backareas, where piped water is not economically feasible, and chlorination of family wells in areas where these remain in use. As these traditional wells remain in use as a major water supply more attention will be given to the option of improving these wells in forthcoming designs.

Designs and design criteria for piped schemes do not take into account the actual conditions under which the schemes are operated and used. In several states designs are made for less villages and lower design populations than are actually served. While designed for a continuous (24 hours) water supply, in practice supply hours are restricted, so as to reduce O&M costs and due to rationing of electricity supply.

Consequently peak loads are higher than designed for, affecting the technical life of the scheme. Cisterns and standposts cannot cope with the consumers' demands and the bacteriological quality of the water is threatened by backsyphoning and cross-contamination. Other factors in poor scheme operation and high maintenance costs are the requirement to accept the lowest tender for materials and equipment, without quality norms, and non-adherence to designs and quality standards during construction.

b) O&M organization

Organizational arrangements for rural water supply vary. The Boards in Gujarat, Kerala and Uttar Pradesh are only responsible for water supply and sanitation[3]. The PRED in Andhra Pradesh and the PHED and Zilla Parishad engineering departments in Karnataka are responsible for rural water supply, sanitation, roads and public buildings.

The scope of O&M responsibilities for rural water supplies also varies. The PRED in Andhra Pradesh maintains only comprehensive schemes, or 10% of the piped rural water systems. Some 19.950 individual village schemes are operated, maintained and managed by the Panchayats.

In Gujarat the GWSS Board does the O&M of comprehensive schemes in 2879 villages as well as 60,000 handpumps. O&M of individual village water supplies, in 6107 villages, is done by the Panchayats.

In Kerala the KWA is responsible for O&M of all 1462 piped water supplies, of which some 1200 are small schemes (village schemes).

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[3] In the GoI-GoN cooperation programme in UP, Jal Nigam also implements on-site sanitation projects, together with the PSUF. In Gujarat, this is delegated by the GWSSB to the Environmental Sanitation Institute, an NGO; in Kerala the KWA does not do any n-site sanitation; the programme is implemented by the SEU Foundation.

In Uttar Pradesh, UP Jal Nigam maintains all piped schemes and almost half a million handpumps.

Where engineers handle also rural roads and buildings and have relatively few water supplies to operate and maintain, changes of attention and transfers of staff are frequent and have a negative impact on O&M.

Lack of specialization for water supply does not occur in the water boards. Nevertheless the same rural water supply engineers are usually responsible for design, construction, O&M and administration. Because design and construction have a higher political and organizational priority and status and the performance of O&M has no meaning for staff careers, engineering staff often not develop the required special skills and appreciation for O&M.

In Andhra Pradesh and Karnataka, separate units for rural water supplies have been set up for the GoI-GoN programme ~~in Andhra Pradesh and Karnataka~~, to reduce the problem of the lack of specialization in the PHEDs. The staff of these units receive specific training on RWS.

In the other states, decentralized units are often responsible for construction and O&M. Efforts to make a clearer separation between responsibilities for construction and O&M have not been very successful.

Other institutional problems affecting O&M are an inappropriate numbers and qualifications of staff, frequent staff transfers and lack of an organizational culture and structure for O&M of piped rural water supplies.

Participatory handpump maintenance in UP

GoI-GoN cooperation in handpump maintenance is restricted to Uttar Pradesh. Here almost 70,000 handpumps have so far been installed under the Indo-Dutch Cooperation programme. In 1986, handpump maintenance and repair in UP were shifted from UPJN (the board) to the panchayats. The transition period was however prolonged and a large number of cases UPJN continued to carry out the repairs.

In retrospect the experiment to bring the O&M responsibility closer to the villages did not success because the Gram Panchayats were functionally inactive, most of the control remained in the hands of the block administration and the panchayats did not have the requisite backup support and skilled manpower for handpump maintenance, repair and management.

In mid-1987, UPJN resumed all responsibilities for handpump maintenance and repaired over 200,000 handpumps. The State Government has earmarked an amount of Rs. 300/handpump/year for Jal Nigam to maintain and repair the pumps. The actual amount received is however much less (normally Rs. 150/pump/year) and bears no relation to the maintenance requirements.

To test the effectiveness and efficiency of village handpump maintenance with proper back-up a pilot project was carried out in Lakhimpur Kheri district in 1989. Local women were invited to come forward for training as handpump caretakers. Each was asked to indicate how many handpumps she could maintain, depending on distance and physical and cultural mobility. After training each woman was given a stipendium by UPJN, based on the amount available for salaries and the number of handpumps she maintained.

In the area the effectiveness of maintenance increased, while costs were lower, because the costs of transport was reduced while the salary costs remained the same. The approach is now scaled up to a full-fledged programme. In 600 villages 100 cluster mechanics (1 mechanic/50 handpumps) and 5792 caretakers are trained, of which three quarters are women.

The above-described system has been integrated into the draft state plan for handpump maintenance of June 1991. This plan foresees that in the relatively affluent western region of UP, the panchayats are given the responsibility for maintenance, repair and maintenance management and financing. In the south-west with greater water scarcity Jal Nigam will backup the panchayats with a mobile district repair team. In the poor eastern and central regions with many handpumps the plan foresees in a backup system by UPJN-employed block mechanics and mobile teams.

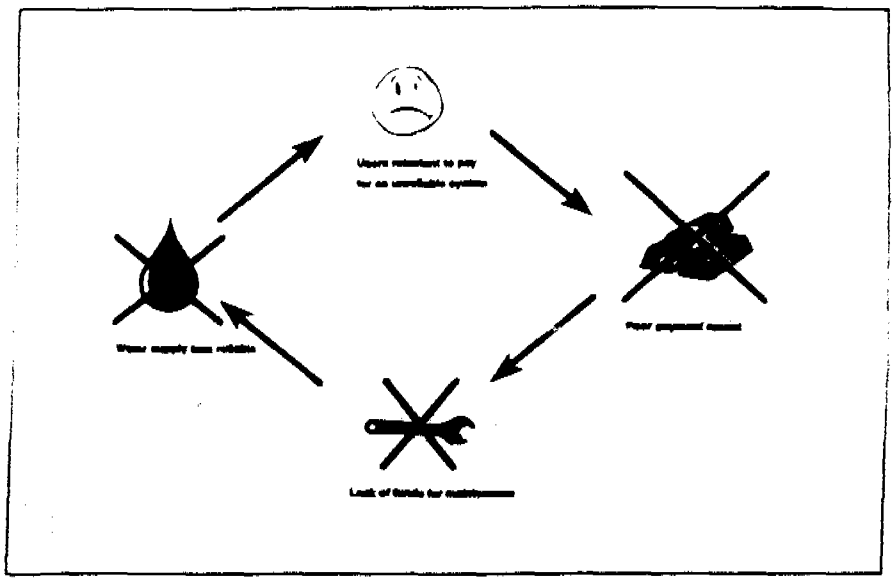
c) O&M procedures and manuals

Specific procedures and manuals for O&M of individual piped schemes and of handpumps were found to be absent. Support offices and missions have therefore assisted the water department to compile tailor-made O&M procedures and manuals for selected schemes, such as Santalpur in Gujarat, handpump schemes in Uttar Pradesh, and several schemes in Andhra Pradesh and Kerala (under execution). The involved capacity building is either on-the-job, or part of a special project (O&M Improvement Programme in Kerala). The intention is that staff from the water boards and department establish similar tailor-made procedures and manuals for other schemes.

d) Costs and financing of O&M

A critical structural problem of all piped water supply schemes and handpumps established under the GoI-GoN cooperation programme is that they are not financially self-sufficient, even if depreciation and loan costs are not taken into account. Cost-recovery in 13 districts in Gujarat, for example, was between 1% and 2% of the charges to be covered (Vasavada, 1996:9). The difference is met by annual state subsidies. However, budgeted amounts are often lower than needed and actual allocations are often lower than what is budgeted. This leads to reduced O&M and a deteriorating water supply and makes it harder to collect water tariffs (Fig. 1).

Fig. 1 The vicious circle of poor O&M



Forced by the shortage of funds for O&M and facilitated by the combination of construction and O&M tasks, staff in some states tend to undertake the most essential maintenance and repairs with funds from the implementation budget and book expenditure for O&M against these budgets. Transport and supervision costs for O&M are also often booked under construction, leading to a lack of clarity and transparency of real O&M costs.

In the piped schemes constructed under the GoI-GoN bilateral cooperation, special efforts have been made to improve billing and collection and administration of user contributions, along with an improvement of the quality of service of the water supply. Also, in Uttar Pradesh, where sufficient groundwater of good quality is yet available in the concerned districts, public taps, for which no payments were collected, have either been replaced by handpumps or by shared group taps, for which the users also share the tariff.

Experiments with revenue collection drives for O&M with the participation of local water committees exist in sub-projects IV (piped water supply) and sub-project VIII (handpumps) in Uttar Pradesh. In Kerala an experiment was taken up, whereby a local voluntary organization recovers the GoK tariff of Rs. 875/standpost/year directly from the standpost users, with the support of the local water committees and against a small incentive.

To bring down maintenance costs and improve scheme performance, a special experiment was carried out whereby trained standpost attendants not only reported breakdowns, but themselves did above ground repairs, which constituted about 70% of all repair cases.

e) Monitoring of performance

When O&M activities started, no monitoring of operation and management, including speed of repairs during breakdowns and level of reliability of supply to the consumers existed. Systems to monitor scheme performance have now been or are being set up for the water supplies installed under the GoI-GoN cooperation programme.

In Andhra Pradesh, prior to monitoring, as-built information is collected for all schemes. Thereafter schemewise monthly data are collected on quantity of water produced and quantity and regularity of water delivery at village tanks and standposts. Also collected are data on daily chlorination, as indicator of water quality, and on % of standposts giving water. Production data are collected by the PRED, village delivery data by NGOs and village water committees. The monitoring system has been officially cleared and trials are run in several schemes.

In Gujarat the monitoring system measures the reliability of supply by registering on what days villages of a scheme have or have not received any water. The individual data are aggregated into summary graphs which show the monthly reliability of service. Monitoring and control of leakage were also introduced.

In Uttar Pradesh, the PSU Foundation reports among other things on the functioning and condition of village water points. Three-monthly consolidated data show number of villages visited, number of waterpoints reviewed, number of waterpoints without platform/drainage, a muddy or sandy discharge, number of points out of order or needing repairs, and number of points repaired according to UPJN and confirmed by observation of PSUF.

In Kerala, local standposts attendants report problems to the water agency and register subsequent t repairs. A functionality study in two schemes showed that during 65%-72% of the time the standposts gave water at key times of the day and that 4% to 50% of the standposts had been without water for 4 consecutive days. A regular monitoring system for all schemes is yet to be put in place.

Maintenance and use of installed household and school latrines is monitored by the PSUF in Uttar Pradesh and the Ward Water Committees and SEUF in Kerala.

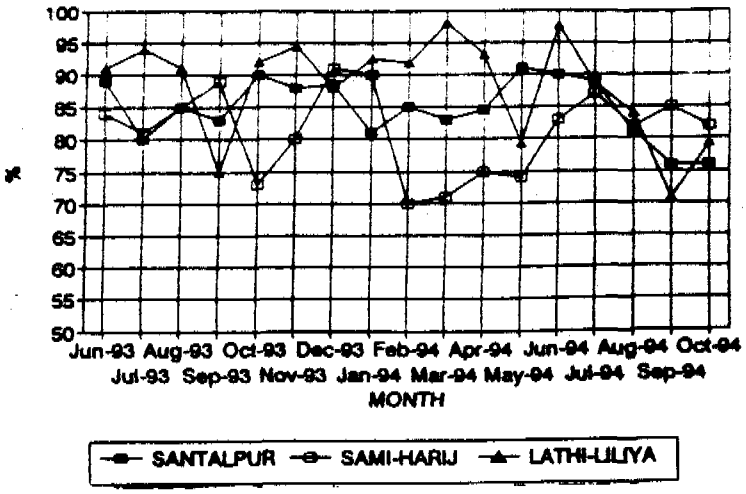
4. Performance of water and sanitation systems

The effect of the physical projects and the institutional and human resources development becomes visible in the performance. Monitoring data and surveys show that in all states the installed water supplies function. However, the quality of performance is generally reported as inadequate. Water is usually supplied during only a few hours a day and the supply is not reliable and at predictable hours.

to 80%. Community participation also made it possible to jointly close down more than 50 public standposts that did not meet the programme's criteria, such as a sufficient number of users.

The impacts of performance monitoring combined with capacity building and review visits in Gujarat is given in Fig. 2. Two of the three schemes generally gave water to all connected villages during 80% or more of the time. Maintaining a target of 95% is strived for.

Fig. 2 Service level of monitored water distribution in 3 schemes in Gujarat



Source: Gu-32, October 1995

b) Sustainable water resources

The sustainability of water resources for drinking water supply is a growing concern, especially due to competition for the same water for irrigated agriculture. The problem is most serious in Gujarat, where depletion of groundwater causes problems in water quantity and quality and some 30% of the individual village water supplies has become defunct due to failure of water source and breakdown of pumping machines (Vasavada, 1996:7). However water resources problems are also found in parts of the GoI-GoN cooperation programme on RWSS in Andhra Pradesh and Karnataka and recently in Uttar Pradesh. Structural solutions which address the core of the problem have not yet been found.

c) Maintenance, use and operation of latrines

Data on maintenance of the installed household latrines are given in Table 2 and Fig. 3. They show that maintenance and use of the installed latrines are generally good. In Kerala, campaigns on switching pits are carried out when latrines are over two years old. Some 6,000 out of 13,000 families have been trained. An action learning campaign on pit emptying is scheduled for 1996.

are also found in parts of the GoI-GoN cooperation programme on RWSS in Andhra Pradesh and Karnataka and recently in Uttar Pradesh. Structural solutions which address the core of the problem have not yet been found.

c) Maintenance, use and operation of latrines

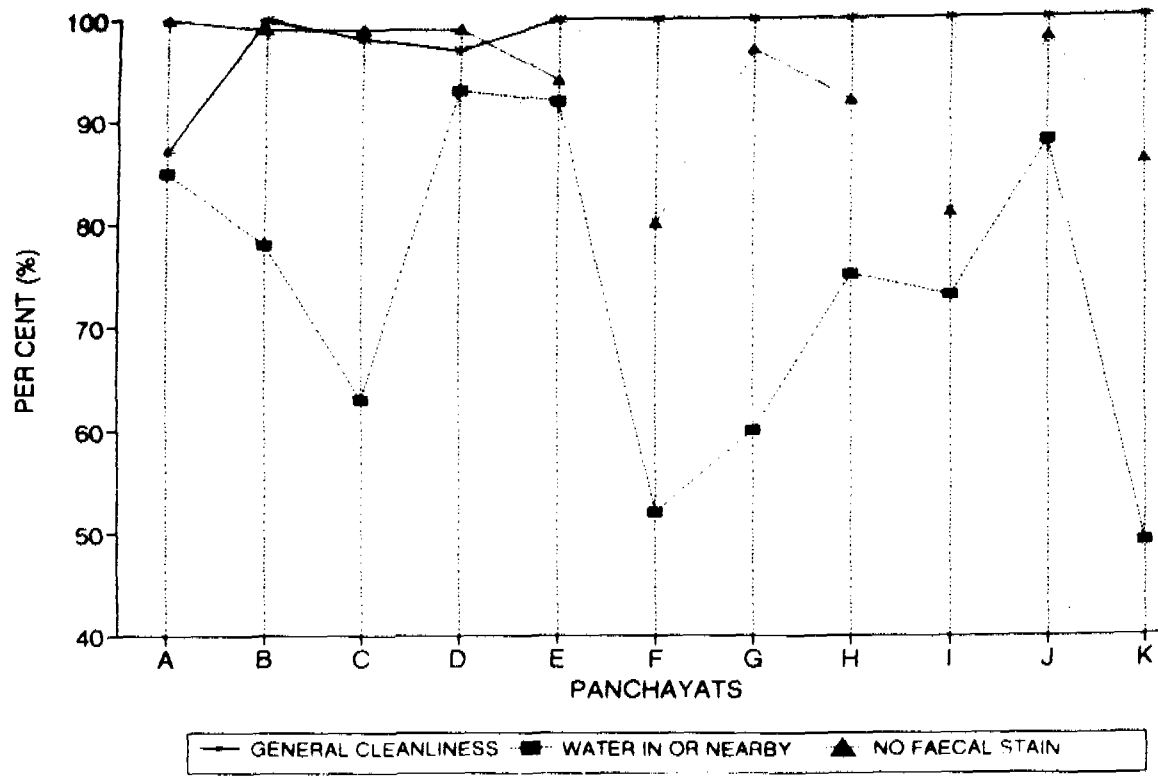
Data on maintenance of the installed household latrines are given in Table 2 and Fig. 3. They show that maintenance and use of the installed latrines are generally good. In Kerala, campaigns on switching pits are carried out when latrines are over two years old. Some 6,000 out of 13,000 families have been trained. An action learning campaign on pit emptying is scheduled for 1996.

Table 2 Status of use and maintenance of household latrines in 2 programme districts in UP, October 1995

District	No. of latrines installed	No.of latrines monitored	Maintenance status in %			% latrines in regular use	Use by different household members, in %		
			Good	Satisf.	Poor		Female	Male	Children
Rae Bareli	3,362	3,246 (97%)	83	14	4	97	88	90	78
Varanasi	6,166	3,566 (58%)	66	26	4	85	N.A.	N.A	N.A

Source: UP-36, 1995: 45

Fig.3 **Maintenance of latrines in 11 panchayats in Kerala (1994)**



Source: Kurup et al. 1996. The community-managed sanitation programme in Kerala: Learning from experience, p.51.

d) Sharing of O&M costs

Results from work and experiments on sharing of O&M cost show some progress. In Gujarat, cost recovery for piped systems compares favourably with other areas (Table 3). In Uttar Pradesh, cost recovery is about 1/4th of O&M expenditures. However, cost recovery is far from adequate, even more so, when the percentages paid are related not to what is currently expended on O&M, but to what would be needed for a reliable service which supplies in any case the quantity of water needed daily for human health.

Table 3 Comparison of cost recovery in schemes with and without GoI-GoN cooperation

State and schemes/projects		% cost recovery for O&M for standposts and house connections			
		schemes under GoI-GoN cooperation		all schemes	
Gujarat:	Santalpu r Lathi-Lilya Sami-Harij	2.0 7.4 20.0	no HCs	1.5	N.A
Kerala:	Kondotti Nattika Firka Mala	66 25 9	No HCs	in practice *no recovery* for SPs	21.4
Uttar Pradesh:	Sub-project I Sub-project IV	Cost recovery for SPs started	25.2-26 20.2-25	No cost recovery for SPs	N.A

N.A : no answer

Experiments with community participation in tariff collection occur in Uttar Pradesh and Kerala. In sub-project VIII in Uttar Pradesh the Jal Samithis, or local water committees, raised over Rs. 200,000 for O&M of the piped water supplies, most of which is spent to repair pipe breakage and leakage. Users are encouraged to pay a tariff of Rs. 40/household/year which is the average amount spent on direct O&M costs by Jal Nigam and to pay these costs either yearly or in instalments. The collected funds are kept in a separate village account which is open to an annual audit. In Varanasi and Allahabad in Uttar Pradesh a similar experiment goes on. Existing standpipes have been converted into group connections and illegal connections have been mapped and converted into legal connections. All users have to pay a flat tariff for their group connection or share the tariff for the group connection. The aim of the experiment is to gradually arrive at 100% coverage of direct O&M costs. Payments for O&M of handpumps have started in 28% of the concerned handpump villages. In Kerala, collection of user payments for standposts through community participation resulted in a collection efficiency of 9% to 66% (Table 3).

e) Community management

In the GoI-GoN cooperation programme on RWSS general agreement exists on the necessity of projects which capacitate and support panchayats and village water committees to manage their individual village water supplies and to share the management of comprehensive schemes with the state water agencies. However, management and politicians in several states have been reluctant to execute or continue such projects. Other barriers to reliable water supplies are the reluctancy to set minimum performance norms for water supply systems, set realistic tariffs and give managing engineers the required autonomy, skills, tools and career incentives to operate, maintain and administer a reliable service.

4. Conclusions and recommendations

Good O&M of installed water supply and sanitation systems is a crucial aspect of public health engineering and community participation. Good O&M preserves costly assets and greatly benefits the public health and social and economic impacts of the schemes.

Better O&M starts with the building and use of human capacities for proper design and construction/construction control. Current design criteria and norms are not sufficiently related to O&M realities in the field and need careful reconsideration.

Training on O&M takes place on-the-job, through training events in the field and as part of courses in The Netherlands. Training has mainly had a non-structural character and access to training abroad has been limited, even more so for female staff.

Poor O&M is especially a political and institutional problem. Politicians support construction, not functioning (Fig. 4). In institutions there is no or insufficient specialization, appreciation, capacity building, autonomy and accountability for O&M. Engineering staff in the field have limited means, tools and authority for O&M. In career development O&M performance does not play a role. Codes of practice and definition of service norms are missing.

Fig. 4 Poor O&M is a political problem

Want some water to drink, sir? You have to wait till you fulfill the promise you made during the last elections!

A crucial and structural problem is the paucity of funds for O&M. State subsidies are less than required and allocations are lower than budgeted for, even when taking into account that initial submissions are inflated in view of practices of budget slashing. In agency managed schemes only partial billing and collection take place and accounting for O&M is not transparent.

Experiments with decentralized maintenance, monitoring and tariff collection, backed up by professional social support, have been successful and have proven the validity of a gender approach. Scaling up has so far been limited to handpump maintenance, due to the already mentioned political and managerial constraints.

A major reason for inadequate maintenance and management of water supplies by panchayats is the lack of professional support for skills in maintenance, management and accountability. In communities, panchayats need professional assistance to manage maintenance and financing and account for financial management and quality of service to the tariff payers.

Monitoring of the quality of water supply services and the hygienic maintenance and use of latrines and waterpoints has started throughout the programme. Practical monitoring systems have been developed which vary in scope and community involvement. The systems give valuable information on service performance. Whether this information is used for managing O&M depends both on the political and managerial levels as well as the skills and means of the engineers, NGOs and village organizations in the field.

Problems with sharing and preserving water resources are a growing concern and directly threaten the longer term quality and sustainability of drinking water supply. A solution for these problems has yet to be found.

Recommendations

To build up O&M will require a change in political and managerial climate. Realistic state strategies are in particular needed for the financing of full and real O&M costs together with the consumers. Adaptations in design criteria and procedures associated with O&M and service levels relate also to national decision-making (CPHEEO manual).

Performance of schemes would benefit when performance norms are set and staff are provided with the means, tools and authority to pursue these norms and are rewarded in their careers when performance is good.

Other measures for better performance are to build monitoring of scheme performance into O&M procedures and to use the consolidated results for management decision making. Monitoring systems need ckecks and balances built in.

Community management of village-level water supplies and of sanitation programmes offers excellent opportunities to improve DWSS services. The same is true for the shared management, between water agency and communities, of comprehensive schemes. The legal and political environment for community/shared management has been established. Much depends now on the cooperation of the water agencies in operationalizing the principles and on the capacity building of the panchayats and village water committees for community managed village systems and shared management of comprehensive schemes.

Training and education on O&M deserve a more structural place in state training and education institutions and in capacity building programmes for male and female members of panchayats and water and sanitation committees. Management of O&M and O&M financing needs particular attention, taking into account experiences from inside as well as outside India.

Initially NGOs and other social experts can handle capacity development and back-up support for community participation and management. Ultimately engineering education for drinking water supply and sanitation for rural and low-income urban populations will however have to integrate the social aspects, as they are indispensable elements of the basic infrastructural services for and with these populations.

BIBLIOGRAPHY

Netherland-Assisted Projects Office, 1996. Note on the monitoring of operation of schemes. Hyderabad, Andhra Pradesh, Netherland-Assisted Projects Office.

Project Support Unit, 1996. Note on proposed approach on community-managed O&M of water supply. Bangalore, Karnataka, Project Support Unit.

PSU Foundation, 1996. Community based approach to O&M in rural water supply and sanitation in the State of Uttar Pradesh: reflections on the Indo-Dutch Bilateral Programme. Paper prepared for the National Workshop on O&M in the Water and Sanitation Sector, New Delhi, September 25-27. Lucknow, Uttar Pradesh, PSU Foundation.

PSU Foundation, 1996. Realising the change. Emerging trends in the Indo-Dutch rural water supply and sanitation programme in the state of Uttar Pradesh, India. Lucknow, Uttar Pradesh, PSU Foundation.

Teeka Ram Meena and K. Balachandra Kurup, 1996. Operation and maintenance in water supply and sanitation. Paper prepared for the National Workshop on O&M in the Water and Sanitation Sector, New Delhi, September 25-27. Trivandrum, Kerala, Government of Kerala and SEU Foundation.

Vasavada, B.J. 1996. Operation and maintenance of drinking water supply schemes: Gujarat experience. Paper prepared for the National Workshop on O&M in the Water and Sanitation Sector, New Delhi, September 25-27. Ahmedabad, Gujarat, Gujarat Water and Sewerage Board.

ISSUE PAPER

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Operation and Maintenance of Rural Water Supply and Sanitation Systems

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National Paper on Operation and Maintenance of Rural Water Supply and Sanitation Scenario in India

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Current Status

Despite a large number of initiatives and impressive success in coverage (over 80 %), it is a matter of deep concern to both the Central and state governments that even after five decades of independence a large segment of the rural population of India does not have access to safe drinking water in adequate quantity and of the desired quality.

The Survey Status report of 1994 and progress during the following two years reveals that as on 1st April, 1996, there were still 75,782 not covered (N.C.) habitations, 3,31,648 partially covered (P.C.) habitations, while the remaining 9.11 lakh habitations are fully covered. In terms of population coverage, the figure stands at 81.49 % with large regional and state variations. For instance, the coverage is as low as 44.81% in Kerala and as high as 100% in Maharashtra.

The reasons for such disparities are not far to seek:

1. The fast pace of development all over the country, especially in the irrigation sector, in which **the area has increased from 6.5 million hectares in 1950-51 to about 40 million hectares at present** has resulted in a build-up of pressing demands on the available water sources in rural areas.

2. Along with the build-up of demands, drinking water sources are increasingly becoming vulnerable to pollution from open defecation, domestic actvities, agricultural run-off (**the total production of fertilizers in the country has reached 11 million tonnes per annum**) and other factors. Collectively, these pose serious health hazards such as frequent break-outs of water related diseases which include diarhoea, cholera, typhoid, etc. It is an accepted fact that 80% of child deaths in developing countries, including India, are due to water borne diseas alone.

3. The combined result of pollution and competing demands for groundwater and overwithdrwal for agriculture, industry and domestic use, along with improper land and water management has been two fold. Number one, it has drastically increased the cost of implementation of water supply schemes. Number two, in many cases, it has led to the adoption of a technology not easily understood by the community.

4. One of the major reasons for poor access of communities to safe drinking water is lack of effective operation and maintenance (O & M), as a result of which many schemes have fallen into disrepair and no longer provide the services for which they were constructed. **Because of this, the actual coverage levels of safe water in India may be even lower than statistics would suggest.**

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5. For O & M activities, which form such a crucial but often neglected element of water supply schemes, it has been estimated that Rs. 900 crores/annum is required for ongoing work and for sustaining the assets created during the last couple of decades, whereas the current allocation for O & M is hardly Rs. 225 crores.

Evolution of the Water Supply and Sanitation Programme

In India, the National Water Supply and Sanitation Programme was introduced by the Union Ministry of Health in September 1954 during the First Five Year Plan (1951 -1956). The states are primarily responsible for implementation of related schemes for upliftment of the health status of the population.

During this post independence period, villages in India were traditionally dependent on conventional water sources such as open wells, village ponds, shallow handpumps, rivers, streams, canals, etc. for their requirement of waster for drinking, bathing, washing and other purposes including provision of water for their cattle.

From the First to the Third Five Year Plans and upto the Annual Plans (i.e. 1951 - 1969), the Water Supply and Sanitation Schemes were focussed on construction and renovation of wells, and installation of shallow handpumps. The state government agencies excuted this work with contribution/cost sharing from local bodies as well as communities. Thereafter, the systems were maintained by local bodies and communties.

The total investment made in the sector from 1951 to 1969 was barely Rs. 128.67 crores, and the coverage of the rural population with water supply was 5.70 % (base year 1970).

The epidemic due to faecal contamination of drinking water sources together with the severe drought conditions in the late sixties,particularly in the northern states of Uttar Pradesh and Bihar, resulted in a beginning being made in the development of the revolutionary Indian handpump.

A Turning Point

The seventies marked a turning point in rural water supply programmes in India. With the breakthrough of India Mark II handpump technology, together with technological developments in drilling and pumping methods, the tapping of deep aquifer became easily attainable.

A Centrally sponsored scheme of Accelerated Rural Water Supply (ARWSP) was launched in 1972. At the state level, rural water supply was included in the Minimum Needs Programme in 1974-75, with the aim of achieving greater coverage and facilitating a higher flow of financial resources.

Coverage of Rural Population with Water Supply as per Government of India norms

Year (As on 31st March)	Total Rural Population in Million	Rural Population Served in Million	Percentage of Rural Population Served
1951	299.00	6.00	2.00
1961	360.00	14.00	3.88
1971	439.00	26.00	5.92
1981	525.45	162.07	30.84
1991	627.14	462.76	73.79
1996	692.12	564.00	81.49

Positive and Negative Impact

The positive development in the decade of the seventies was that resource alloactions for the RWS sector vis-a-vis the total plan outlay rose from 0.60% during 1951-69 to 1.24% during the Fifth Plan (1974-79). A negative fallout from the increased coverage thrust was that people discarded the traditional sources (developed and maintained by them as a matter of course) and became accustomed to the systems (mainly handpunmps) provided and maintained by government agencies. Thus began an era when communities became not only alienated from the systems provided for them, but came to believe that it was the responsibility of the government to provide a safe drinking water supply system as a free commodity, as well as to operate, maintain and sustain the systems on behalf of communities.

Developments in the Eighties

The International Drinking Water Supply and Sanitation Decade (1981 -1990) which spanned the eighties had its origin in the resolution from the United Nations Habitat Conference in 1977, followed by the Resolution in the U.N. General Assemby in 1990.

Rajiv Gandhi National Drinking Water Mission

The Technology Mission on Drinking Water and Related Water Management (now known as the Rajiv Gandhi National Drinking Water Mission - RGNDWM) was introduced in 1986. The Mission mode, which is a qualitatively different method of government functioning with definite goals,time bound targets, science and technology inputs, health education, participatory functioning and an integrated approach, community participation, and human resource development, represented the new thinking in the field of rural water supply.

The Mission mode approach was an excellent exposition of the holistic concept of the Water Supply and Sanitation programme. Perhaps the most evident weakness in an otherwise comprehensive conceptualisation is the relative lack of importance given to O & M, which finds only a passing mention in the Mission documents.

However, a year before the Mission was launched, for the first time ever a maximum of 10% of the plan funds under MNP was eramrked for O & M for the RWS system. In the subsequent year (1988-89), a similar allocation was also made against ARWSP.

The coverage of the rural population with water supply improved from 5.7% in 1970 to 30.84% in 1981, and there was a discernable decline in the Infant Mortality Rate (IMR) during the period.

Strategies in the Nineties

One of the strategies laid down in the Eighth Five Year Plan gave thrust to the management of water in exactly the same manner as any other resource. It was realised that there should be more emphasis on grass root initiatives and less on centralised control. It is only Panchayat Institutions which can make that happen more meaningfully. It was with this deep rooted desire to empower the village communities that the new Panchayati Raj Act emerged as result of the 73rd Amendment to the Constitution of India in 1992.

Under the Act, PRI is responsible in entirety for O & M, with necessary freedom to raise appropriate user charges to strengthen the financial base — better financial management of the water supply system being a pre-requisite for sustenance of the assets created.

Involvement of the panchayats through both structural improvement and better management is an immediate task. The State Finance Commission should decide on the devolution of revenue to panchayats to enable them to discharge their responsibility. The O&M of handpumps & standpost should be handed over to PRI and they may follow the detailed guidelines already issued by the Water Mission during December, 1994. In this context, it would be worthwhile to assess the prevailing ground realities of O & M.

Operation and maintenance system in vogue

The water supply system and its operation and maintenance practices in India can broadly be classified under three major heads:

A. Traditional sources viz, dug wells, rain water harvesting, shallow pumps (3-4 meters) etc. which are sustained by the communities themselves.

B. Handpumps installed by the government agencies and mostly maintained by the Panchayats or local bodies, either through one tier, two tier or three tier system.

C. Piped water supply schemes, especially regional water supply schemes, predominantly operated and maintained by PHED or Water Supply and Sewerage Board as the case may be. But in case of single village schemes or schemes covering a group of villages under the same Panchayat, the system is generally operated and maintained by PRI's.

Major constraints

At present, the system labours under the following major constraints :

a) Operation and Maintenance is a neglected area

b) Capital development has always received priority

c) Sector thrust is more on funding for new projects than to augment the defective existing projects

d) The major reasons for poor operation and maintenance are :

   i) O&M is neglected during planning and design phases of the project development.

   ii) Inappropriate technology is adopted without considering the O & M aspects.

   iii) Lack of ancillary facilities (e.g. workshop, vehicles, trained personnel, etc.)

   iv) The job of O&M is not given due recognition and credit.

   v) Backlog of rehabilitation grows year by year and becomes unmanageable at a point of time.

   vi) The cost benefits of adequate maintenance as well as the cost disadvantages of inadequate maintenance are never clearly worked out at any stage of planning, design and implementation.

   vii) Training, management, provision of supplies, applied research and development are often neglected in this sector particularly in rural areas.

viii) Obtaining information on O&M performance, costs and benefits therefore, becomes an arduous task.

ix) Poor system performance can also be caused by events not under the control of the operating agency. e.g. upstream water pollution may exceed treatment capacity or the present treatment technology adopted is an inadequate. Diversion of water resources from the sources or along the line or over withdrawal from groundwater source around H.P./T.Ws for other activities may cause rapid depletion of water and may cause severe supply deficiencies regardless of operating skills.

x) Inadequate O&M is tied to many institutional problems, most of which are not amenable to corrections without major institutional changes.

xi) Expansion of system under popular pressures with act determining its technical feasibility.

Observations and Recommendations of the Expert Committee

The Expert Committee on RWS Programme under the chairmanship of Dr. B.B. Sundaresan, constituted by the Water Mission during April, 1994 reported that wherever PRI funds are involved, the funds are practically government funds. In most states handing over the assets to the PRI has been mostly a formal exercise on paper.

Even where they have been handed over, during times of scarcity, yielding to public pressure, the government intervenes and funds the repairs. Cost recovery for O&M was barely in evidence. Requirements of funds are assessed more by rule of thumb than based on analysis of empirical evidence, and even the limited fund available is distributed, and that too is not always necessarily based on a rational assessment of needs. However, there have been interesting experiments by voluntary agencies which have met with significant success.

The Expert Committee further observed that the conventional notion of Non-Plan funds for O&M could do a lot of damage. Faced with a shortage of Non-Plan resources, States find it convenient to create new assets using Plan funds instead of maintaining or rehabilitating existing systems. The Committee recommended a more rational determination of needs. Probably more Plan funds could be used for O&M, provided there is assured contribution from the public in cash or by way of labour. This will result in considerable net savings and sense of ownership among users.

The Committee recommended that at least one O&M experiment must be taken up in each State (more in large States), covering a Block area, with the full participation of the community, the NGOs and local elected bodies (PRI). This scheme could be sponsored by GOI with the aim of development of suitable models.

The National and the State Governments have already invested more than Rs. 15,000 crore in the sector and projections show that more than Rs. 20,000 crores may be required for sustaining the program (inclusive of the replacement needs of schemes whose normal life will be over during the next five years).

There are also large numbers of defunct systems which if repaired and maintained properly would serve the people for some more years. Rehabilitation is the extreme form of O&M which would not have been required or could have been postponed if regular maintenance had taken place. What could have been achieved with an expenditure of Rs. 3000-Rs.4000 in repair of a handpump, is now sought to be realised, incurring as high a cost as Rs. 30,000 for putting up a new handpump.

As mentioned earlier, it has been estimated that Rs. 900 crores/annum is required for O&M activities and sustaining the assets created during the last couple of decades, whereas the current allocation against O&M (i.e. 10% of ARWSP & MNP Allocation) is hardly Rs. 225 crores.Given the economic and financial scenario, it is difficult to visualise public resources of such a magnitude and hence the need for involvement of the community, panchayat institutions and and NGOs, in addition to the existing Government agencies in the sector.

The Tasks Ahead

Decentralised O&M through PRI

From past experience and the above account it is evident that in a country like India, so vast and diversified in terms of the socio-economic, cultural and political context, terrain and geohydrological formations, centralised O&M and centralised government institutions can neither adequately meet the demand of the people nor motivate and involve people at the grass root to participate in all rural development activities including that of the water and sanitation sector.

It has been realised that without the total involvement of the PRI this is not possible. However the transition from the centrally controlled O&M to the PRI should be gradual and the following issues needs to be attended before the final transfer of the total responsibility from PHED to PRI is carried out.

i) The State Finance Commissions should decide on the devolution of revenues to Panchayats to enable them to discharge their responsibility.

ii) Extensive HRD and IEC programmes need to be initiated and taken up in order to orient the elected members as well as the related functionaries to their new role of planners, implementors sustaining the infrastructure developed.

iii) Keeping in view the additional administrative, financial and technical responsibility bestowed on the Panchayats the PRI should be strengthened with specialised personnel. Initially the expert can be recruited on deputation from the relevant parent department.

iv) Last but not the least is that 100 percent cost recovery for O&M should be introduced in the final phase and in subsequent years part of the capital investment should be borne by the beneficiaries.

In order to attain the above the community should be involved from the planning stage right through to implementation and ultimately with sustaining the system. The system to be adopted should be based on the demand from people and the affordability factor.

The political will to introduce cost recovery is the need of the day and an act needs to introduced at the highest level to make the system of cost recovery, at least for O&M, operational. However, the tariff structure should be devolved keeping in view the economic status of the different levels of people in society.

GESTION DES RÉSEAUX DE DISTRIBUTION D'EAU POTABLE
SÉMINAIRE ORGANISÉ PAR LA FUL LE 23 NOVEMBRE 1995

PERFORMANCE ET MISSION PUBLIQUE DE DISTRIBUTION D'EAU POTABLE : SLOGAN OU RÉALITÉ? PREMIERE APPROCHE DE LA PERFORMANCE DU SERVICE PUBLIC D'EAU

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1. INTRODUCTION

A l'heure où le débat sur l'avenir du service public n'a jamais passionné autant de monde: communauté européenne, état, gestionnaires de services, usagers, médias, centres de recherche et où modernisation rime avec efficacité, il nous a paru utile dans ce contexte si sujet à la controverse d'*examiner la réalité de ce nouveau* "slogan" qui introduit, dirons-nous, l'idée d'un nouveau management public.

Dans le domaine qui nous intéresse, le secteur public local et l'activité de distribution d'eau potable en particulier, ce questionnement nous amène à considérer la valeur de cette mission publique et à nous demander si *la recherche de performance dans ce secteur d'activité est compatible avec l'vocation de service public qui lui est propre*. Autrement dit, est-il pertinent dans le cadre actuel de mise en oeuvre de cette mission, d'analyser l'action des gestionnaires à la lumière de ce que certains s'accordent à qualifier de "slogan" ? Ce genre de réflexion est-elle en fait nécessaire ?

Les éléments de réponse que nous apportons nous conduisent à examiner en premier lieu dans l'univers actuel de gestion du service de fourniture en eau potable, comment se pose cette question de la performance des services qui ont en charge cette mission. Il apparaîtra en effet, au-delà de la simple idée de la mode, l'exigence socio-économique d'évaluer l'action mise en oeuvre afin de la (re)nouer avec les valeurs intrinsèques d'une mission "d'intérêt général" qui a la particularité de s'exercer *dans des conditions "industrielles et commerciales"*. Ceci étant posé, nous évoquerons en second lieu le problème de la mesure de cette performance et de la spécificité qui s'attache à l'utilisation d'outils empruntés au secteur privé. Enfin, nous illustrerons nos propos en présentant quelques indicateurs susceptibles de traduire le niveau et la qualité de "résultats attendus" de la part d'un service d'eau.

[1] Nous ne ferons pas de distinguo entre la gestion "privée" et la gestion "publique" des services d'eau considérant que la notion de performance n'est pas liée "à priori " au mode de gestion toutes choses égales par ailleurs.

[2] R. LE Duff : "Management public ou gestion non marchande" - Contribution au colloque de l' Association Nationale des IAE - Tome 1 : Economica 1992.

2. LA PROBLÉMATIQUE DE LA PERFORMANCE DANS LE CONTEXTE ACTUEL DE GESTION DE LA MISSION PUBLIQUE DE DISTRIBUTION D'EAU POTABLE

2.1. LE CONTEXTE DE LA GESTION PUBLIQUE DE DISTRIBUTION D'EAU POTABLE EN FRANCE

Le paysage économique, environnemental, juridique et politique de la gestion de la mission publique de distribution d'eau potable en France n'a cessé d'évoluer depuis les dernières décennies : essor de la contractualisation (délégation de service, gestion indirecte), sensibilité plus grande des consommateurs à la valeur de l'eau, rehaussement des normes de potabilité à la fois sur le plan quantitatif et qualitatif, mouvement de décentralisation engagé depuis les années 1982, évolution du cadre comptable rapproché courant 1991 des règles privées de gestion; élaboration d'une loi sur l'eau en janvier 1992, développement de la normalisation, et plus récemment parution d'un décret en mai 1995 obligeant les gestionnaires de services à fournir un rapport annuel sur le prix et la qualité du service rendu...

Autant de facteurs caractéristiques qui portent en eux les germes d'un élargissement (oserions-nous parler de changement ?) de la notion de service public dans le domaine de l'alimentation en eau. Il n'est dès lors plus étonnant d'entendre parler de "client" à la place "d'usagers", de lier le prix de l'eau - sujet d'actualité - à un niveau de service rendu, d'imaginer qu'un jour l'usager domestique dispose d'un analyseur d'eau de son robinet.

Quoi qu'il en soit, l'implication des gestionnaires de ce service qu'ils soient publics ou privés[1] se veut davantage volontaire dans la *satisfaction d'une mission d'intérêt général* et *marchande*. Se pose alors la question fondamentale de l'*évaluation de l'action* des gestionnaires de ces services dont le défi est de "concilier efficacité et légitimité"[2].

2.2. DE QUOI PARLONS-NOUS ? UN ESSAI DE DÉFINITION DE LA PERFORMANCE EN EAU POTABLE

Le terme "performance" induira des sens différents selon le

contexte de référence avec toutefois une idée forte qui ressort, celle de "résultat" optimal obtenu ou susceptible de l'être. Nous parlerons ainsi de performance atteinte par un cheval de course, un athlète, une machine, une organisation (Petit Robert); un constat qui sous-entend la référence à un niveau, à une norme non figée d'une part, et à un univers de "compétition" d'autre part.

S'il ne s'agit pas ici de faire un exercice de sémantique (fort utile par ailleurs) autour du vocable en question, nous conviendrons que "tout langage est conventionnel"[3], qu'il contient en lui une pragmatique en ce sens qu'il est émis par et pour des acteurs et par conséquent que dans le domaine qui nous intéresse, il sera nécessaire de préciser ce à quoi nous nous rattachons lorsque nous parlons de performance.

Il n'est pas inintéressant de rappeler qu'il y a quinze ans environ, ce terme n'était pas utilisé dans le langage économique et de la gestion. La mondialisation des économies a rendu plus vif que jamais l'aiguillon de la concurrence qui ne s'exerce plus sur la base du seul critère du prix mais englobe d'autres aspects tels que la qualité ou les délais. L'univers de "compétition" actuel dans lequel interviennent les entités économiques les amène à se positionner en termes de performances réalisées à différentes échelles : interne ou micro-économique, externe ou macro-économique.

Dans le domaine de l'action publique en France, la question de l'évaluation était posée dès 1972 par certaines administrations centrales dont le Ministère de la Santé avec la création d'une cellule de contrôle de gestion tandis qu'un texte du Conseil d'Etat proposait l'année suivante une définition du contrôle de gestion public visant à mesurer entre autres objectifs, la satisfaction des usagers. Quelques années avant, les techniques de "rationalisation des choix budgétaires" (RCB), système de planification d'objectifs et de moyens, faisaient l'engouement de la Fonction Publique d'Etat.

En 1989, une circulaire du Premier Ministre de l'époque replaçait cette question sous les feux de l'actualité. La Poste, les Télécommunications, la SNCF, la Défense ... ont à des niveaux divers mis en oeuvre ce genre de démarche. Plus récemment, le rapport Gandois soulignait en parlant de performance qu'y faire allusion revenait à dire que "tout se tient". (technologie, organisation, marché, formation, recherche, financement...).

Les expériences du secteur public local sont en revanche plus effacées et disparates. Certes certaines communes ont introduit çà et là des outils d'évaluation et d'analyse de leur performance mais sans réel retour d'expérience pour les gestionnaires de ce secteur.

En matière d'alimentation en eau potable, les principales actions visant à "évaluer un résultat" sont en majorité focalisées vers le contrôle a priori et a posteriori de la qualité de l'eau distribuée, démarche quasi-naturelle lorsqu'on connaît l'importance que revêt sur le plan de la santé publique le respect des normes sanitaires strictement réglementées au niveau national et international. Le caractère restrictif de ce seul contrôle pour juger de la performance d'un service d'eau se conçoit de plus en plus aisément si l'on en juge à la chronique déferlée par les média ces temps derniers sur les prix pratiqués par certains services et sur leur mode de fonctionnement. On voit se dessiner derrière ces éléments la nécessité de raisonner à un niveau *global* de performance.

Ce bref aperçu historique qui pose le contexte dans lequel évolue cette notion nous ramène à notre propos initial, donner un contenu et délimiter les contours de la performance dans le domaine du service public de distribution d'eau potable.

Définir cette notion exige de notre part ainsi que nous l'évoquions précédemment que nous nous attachions à considérer les spécificités qui caractérisent cette mission.

2.2.1. LA DISTRIBUTION D'EAU POTABLE : UN SERVICE PUBLIC

S'il est un point sur lequel nombre d'auteurs sont unanimes c'est bien sur le caractère variant et instable de la notion de service public qui évolue au gré des transformations des besoins collectifs et de l'idée que l'on se fait du rôle de l'Etat. Les conflits opposant les principales écoles (libérale conservatrice) au niveau des grands débats sur l'Europe notamment en sont une illustration.

Nous ne reprendrons pas ici les critères généraux qui initialement permettent de reconnaître un service dit public (chacun de ces points étant matière à des développements inépuisables) mission d'intérêt général, droit d'accès au service pour les usagers, droit de regard par l'administration sur les modalités d'exécution de la mission (point de départ au contrôle lorsqu'il y a rétrocession de l'exploitation à un tiers)...

Nous nous intéresserons plutôt aux grands principes dégagés par Louis Rolland au début du siècle, considérés en droit public et administratif comme des composantes stables du concept de service public : la *continuité, l'adaptation et l'égalité.*

Il nous semble voir là "l'essence" d'une réflexion sur la performance des services que nous étudions. En effet, le contenu de chaque principe permet d'y rattacher des objectifs concrets de gestion à atteindre par chaque service, objectifs inspirés et découlant de la logique même de la mission.

■ *Le principe de continuité*

Au-delà des différences de conceptions que peuvent révéler les arrêts jurisprudentiels lors de circonstances "exceptionnelles", le principe de continuité s'appuie sur deux fondements :

- l'existence de la puissance publique (fondement constitutionnel),
- la reconnaissance d'un droit pour l'usager à la continuité du service (fondement administratif).

3 Expression empruntée à J-H Jacot : "De la terminologie à la problématique de la performance globale"- Concepts et ingéniérie économiques pour la Productique - Université d'été du Pôle productique Rhônes-Alpes- Sept 1995.

Autrement dit, à partir du moment où la puissance publique intervient pour prendre en charge un besoin collectif, elle est obligée vis-à-vis des usagers de faire fonctionner continûment le service.

Ce principe dans sa conception extensive est largement admis dans le domaine de l'alimentation en eau potable, sauf cas de force majeure (catastrophes naturelles, pollutions accidentelles...)

■ *Le principe d'adaptabilité*

Ce principe qu'on retrouve encore sous le terme de principe de mutabilité est en fait le prolongement du premier principe. Il traduit l'exigence pour le service de faire face aux innovations technologiques, aux mutations des besoins des utilisateurs, de l'environnement ...

Certains auteurs, pour illustrer concrètement ce principe, renvoient au rapport qualité-prix de la prestation fournie (Van de Vyver) dont l'évolution doit aller de pair avec les gains de productivité réalisés grâce au recours à des solutions techniques toujours plus performantes.

La question de la capacité de financement des investissements nouveaux est ici soulevée.

■ *Le principe d'égalité des usagers*

Derrière ce principe on invoque plusieurs aspects : égalité d'accès au service, égalité d'accès géographique, égalité devant le coût du service rendu. Si la desserte en eau potable des populations est quasiment assurée, l'éventualité de discrimination entre catégories d'usagers induite par la structure tarifaire adoptée n'est pas exclue. Se trouve ainsi posée la question de la légitimité des politiques de prix pratiquées par les services, qui est loin d'être un problème résolu en France.

2.2.2. LA DISTRIBUTION D'EAU POTABLE : UN SERVICE PUBLIC "MARCHAND"

La nature industrielle et commerciale reconnue à la mission de distribution d'eau potable[4] lui confère une dimension productive et économique qui s'évalue concrètement par le biais de deux principes : le financement du service rendu par l'usager et le respect de l'équilibre financier du service quelque soit le mode de gestion choisi (article L 322-5 du Code des Communes). Quelques cas pour faire exception à la règle ont été prévus par la loi d'amélioration de la décentralisation du 5 janvier 1988.

■ *Le financement du service par l'usager ou la vérité du lien prix-coûts*

Si ce principe exclut d'emblée tout recours à une subvention (financement par le contribuable) pour assurer l'exploitation du service, il soutend par ailleurs que le prix du service et par conséquent le système tarifaire adopté soit en rapport avec le coût du service rendu, de même il suppose (même si cela est une évidence) que le coût de la prestation fournie soit correctement cerné.

Ce second aspect du principe de financement par l'usager est loin d'être "une évidence" pour les gestionnaires des services si l'on se reporte aux faits mis en lumière par différentes études[5]. En effet, dans bien des cas, on observe une distorsion entre le prix et le coût du service, celui-ci étant estimé notamment dans le cas des petites communes, 2 à 3 fois supérieur au prix.

Certes plusieurs raisons expliquent cet état de fait, en particulier la non prise en compte de la consommation en infrastructures dont la valeur est hautement considérable en eau potable. On comprend pourquoi dès 1991, une nouvelle instruction comptable (la M 49) vient rappeler et rendre obligatoire la pratique de l'amortissement des immobilisations dans la comptabilité des services d'eau et d'assainissement.

Quant aux services exploités par des gestionnaires privés, si l'on suppose que le prix est supérieur au coût pour des raisons de rentabilité évidentes, on note une mauvaise connaissance économique de l'exploitation concédée qui transparaît nettement dans le caractère "très partiel"[6] des comptes-rendus financiers fournis à la collectivité.

Il ne nous semble pas exagérer d'avancer qu'en l'état actuel des pratiques du terrain, de la réflexion et des travaux de recherche, la question de la mesure des coûts de fourniture en eau potable est loin d'être maîtrisée.

En matière de prix de l'eau en France, on recense autant de niveaux de prix pratiqués que de services[7], liés en partie à la diversité des sites de prélèvement, de qualité de ressource, de typologie des sols ... qui induisent des niveaux différents d'équipements et d'infrastructures.

L'impact des facteurs socio-politiques dans les décisions de prix est aussi une variable explicative des disparités observées. De même, on note des différences liées au mode de gestion avec notamment des prix plus élevés pour les services délégués que pour ceux qui sont en régie. Cet écart a tendance à se réduire toutefois depuis la fin de la période d'encadrement des prix et en particulier avec l'application de la M 49.

Les pratiques tarifaires sont elles aussi diverses, la loi sur l'eau du 3 janvier 1992 impose une facturation en fonction du volume réellement consommé. La recherche d'une tarification au plus juste s'accompagne d'un développement du comptage

4 - Code des Communes - Titre VII
- Conseil d'Etat du 9 Mai 1980.Mme Abdesselem, p 643.

5 - Rapport de la Cour des Comptes 1979 - p 87
- La formation du prix de l'eau dans les communes rurales - Ministère de l'Agriculture et de la Forêt - Direction de l'espace rural et de la forêt- Sept 1989

6 selon l'article de M.Desmars : "Gestion déléguée de la distribution d'eau potable : le point de vue d'une association de collectivités" - Journées techniques et Conférences - Mulhouse - mai 1995

7 - Plus de 15 000 services pour l'alimentation en eau et un peu plus pour l'assainissement desservent les quelques 36 500 communes françaises.

et de la recherche d'une meilleure répartition des coûts (fixes et variables) au travers de la formule tarifaire adoptée.

Cela étant, le problème de la tarification de l'eau en France demeure complexe pour les services compte-tenu des objectifs souvent contradictoires à atteindre (efficacité économique, équité, simplicité, redistribution des revenus) et de la multiplicité des paramètres à prendre en compte (coûts du service souvent méconnus, évaluation des externalités liées à la consommation d'eau, évolution de la demande, évolution technologique, solidarité lorsqu'il y a péréquation...)

■ ***Le principe d'équilibre financier du service***

En prolongement direct des éléments contenus dans le principe de financement par l'usager, ce principe suppose la tenue de budgets individualisés pour pouvoir apprécier la réalité de l'équilibre.

Outre les règles comptables et budgétaires qui s'appliquent ici, il nous semble que le véritable enjeu n'est pas tant qu'il y ait eu "résolution" de l'équation recettes = dépenses, mais plutôt celui de la maîtrise des dépenses programmées par le service à l'horizon du budget, pour autant que les principaux centres de responsabilités gestionnaires considèrent ce *budget comme évaluateur de leur faculté à prévoir.*

L'équilibre budgétaire d'une année à l'autre peut en effet n'être qu'artificiel, sans corrélation avec la réalité de l'exploitation du service : les consommations en patrimoine sont-elles prises en compte dans les dépenses de service ? le service a-t-il constitué des provisions de renouvellement afin d'anticiper sur les charges futures éventuelles et lisser les hausses de prix dans le temps ? la variation du volume des stocks inhérente à l'activité de l'exercice est-elle incorporée ? le volume global facturé est-il exact ?

Il nous semble que la recherche de performance en terme de gestion budgétaire doit s'effectuer autour de deux pôles :

- la *maîtrise des dépenses* qui suppose une bonne connaissance technique et économique du service afin de pouvoir bâtir des standards internes:
- la *capacité à anticiper* du service, nous faisons allusion là au niveau de gestion prévisionnelle mis en oeuvre. L'horizon de planification des services se situe bien souvent plus dans le très court terme que dans le moyen et long terme.

Quoi qu'il en soit. il nous paraît opportun sur la base de ces éléments de définition de la mission publique de décliner sous différents aspects (quantitatifs et qualitatifs) les *objectifs de gestion sous-jacents* que doit *atteindre de manière concrète* chaque service compte-tenu de ses moyens et de son environnement: éléments qui spécifieront le contenu de la performance à atteindre.

Le tableau I résume les principaux points évoqués.

2.3. RECHERCHER LA PERFORMANCE OU RECHERCHER LE SENS ET LA COHÉRENCE DES ACTIONS À ENGAGER EU ÉGARD À LA VOCATION DE CETTE MISSION PUBLIQUE

Dans un contexte où il est courant de parler de "crise du service public", et où il est de bon aloi de chercher des

Tableau I – Les fondements d'une approche de l'évaluation de la performance de la mission publique de distribution d'eau potable

Principes fondamentaux de SPLIC	**Objectifs de gestion**	**points clé d'évaluation de la performance**
continuité	permanence du service au niveau de qualité requis	satisfaction de la demande fiabilité des infrastructures réactivité v/v de tout événement conjoncturel
égalité de traitement des usagers	accès généralisé au service tarification équitable	satisfaction des demandes de raccordement non discrimination des usagers
mutabilité	qualité du produit qualité du service	potabilité qualité organoleptique niveau de pression
	qualité des prestations	maîtrise des délais qualité des interventions
	adaptabilité du service	capacité d'investissement
équilibre financier	équilibre budgétaire	maîtrise des coûts
financement par l'usager	politique tarifaire adaptée à l'objectif de coût et à l'objectif de développement du service	rapport prix de l'eau /qualité de service satisfaisant.

explications et des solutions, la grande tendance est à la "modernisation" du secteur public à coups de séminaires, de formation et conseil, de projets de services, de management participatif, de dérèglementation (l'un des points le plus délicat de la construction européenne), etc. Ensemble de méthodes et pratiques en règle générale issues du secteur privé, qui ont dans le domaine qui nous intéresse, à la fois des partisans et des détracteurs. (Bartoli A.1992)[8]

Sans vouloir rentrer dans ce débat qui en opposera encore d'autres, il nous semble que toute organisation quelque que soit sa nature, devrait s'auto-évaluer (exigence qu'elle se doit à elle fois vis à vis d'elle-même et du monde extérieur avec lequel elle établit des rapports du fait de son activité). Cette mesure s'impose dans l'optique de faire le point au fur et à mesure de son action afin de détecter les éventuels dérapages à corriger lors qu'il est encore temps. Cette exigence qui en réalité peut s'appliquer à n'importe quel niveau d'organisation de nos sociétés (foyer, école, association, entreprise, collectivité, état ...) ne rejoint-elle pas les "*principes universels de bonne gestion*" auxquels a fait allusion Gibert P. lors des 45èmes journées nationales sur la gestion des services publics locaux ?

Cette question de l'évaluation de l'action du service distributeur d'eau n'est pas par elle-même une découverte, ni même une panacée à la crise réelle que doivent affronter certains services sur le plan financier, technique et de plus en plus humain (en terme de gestion des hommes). Elle présente en revanche l'avantage d'amener les équipes gestionnaires à se poser les bonnes questions dans un contexte qui, il est vrai, s'est durcit en termes de contraintes techniques, environnementales, économiques et politiques à respecter.

Quelles peuvent donc être ces préoccupations essentielles qui se "noient" dans l'action quotidienne et que l'on perd de vue si le système ne s'est pas doté de moyens permettant de relier le stratégique à l'opérationnel ? Celles des finalités internes et externes de l'organisation.

D'aucuns réagiront vivement et à juste titre ; nous parlons ici de mission publique, ses finalités ne sont-elles pas clairement exprimées à l'origine de la création du service d'eau ?

Certes, répondrons-nous. Toutefois, tant que cette finalité n'est pas soumise à mesure selon des critères objectifs, perceptibles et appréhendables par l'ensemble des acteurs concernés par cette mission (les usagers, les gestionnaires du service, le secteur d'activité, l'Etat ...), il est difficile de s'assurer que les résultats atteints sont effectivement en accord avec la finalité pourtant clairement déclinée au départ. La nouvelle loi Barnier n'est-elle pas à sa façon une manière de le rappeler ? On peut regretter seulement que ce décret ne soit "tombé" au moment où la presse et les autres médias rendaient public un ensemble de "dérives" dénaturant la dite finalité.

Ces propos nous amènent ainsi à considérer le problème de la mesure et nous conviendrons avec d'autres que dans ce domaine, le secteur privé dispose d'une expérience riche de succès réels ou partiels, et d'échecs que nous aurions tort de mépriser sous prétexte de différence de nature d'organisation. Il est question ici de se référer uniquement à l'outil (et non à l'esprit) dont nous emprunterons la définition au petit Robert : "objet façonné, transformé, de manière à pouvoir être utilisé commodément et efficacement pour accomplir une action". L'action ici étant l'évaluation de la performance.

3. LA QUESTION DE LA MESURE : QUELLE MÉTHODE ? QUELS OUTILS ?

3.1. TRANSPOSITION DE MÉTHODES ET OUTILS ISSUES DU PRIVÉ : OUI ...

La question de la transposabilité des outils et méthodes de mesure et de contrôle de l'activité utilisés par le privé dans le management public local n'est pas simple. L'analyse d'expériences publiques de transfert de ces outils ainsi que le fait Amintas A.[9] à la suite d'autres auteurs (Burlaud - Gibert 1984) a démontré plus d'une fois les heurts et les limites d'une insertion strictement "instrumentaliste" de ces outils. Le contexte organisationnel, les schémas de pensées, la culture du service, les conflits de rationalité des différents acteurs sont autant de paramètres qui détermineront la finalité et l'efficacité de l'outil et seront susceptibles de le détourner de sa vocation première qui rappelons-le, dans notre cas, est de *mieux connaître pour apprendre à mieux piloter dans le sens voulu.*

Autrement dit, il ne saurait être question d'une logique de simple transposition, il s'agit plutôt à partir d'outils de "saine gestion" empruntés de se doter d'un système d'information qui épouse les spécificités de l'organisation et qui se fraie sa propre voie sur le nécessaire chemin de l'apprentissage.

3.2. ... MAIS À LA CONDITION DE SE FONDER SUR UN MODELE DE REPRÉSENTATION DU SERVICE PUBLIC CONSCIENTE DE SES SPÉCIFICITÉS ET EN PRISE DIRECTE AVEC LES ÉVOLUTIONS DE SON ACTIVITÉ ET DE SON ENVIRONNEMENT.

Tout système ou technique d'évaluation véhicule immanquablement la représentation que se font les acteurs de l'organisation, l'organisation des outils étant alors orientée vers des préférences mesurables.

Le cas de l'alimentation en eau potable est de ce point de vue très parlant car si l'on examine les niveaux d'informations mesurés par les services, on tombe alors dans toute une série d'indicateurs reflétant l'état de fonctionnement "technique" du service : (rendement du réseau, indice linéaire de perte, puissance énergétique consommée, volumes produits en pointe, qualité de l'eau brute et distri-

8 Communication de Bartoli Annie : "Conceptions et pratiques de management dans le secteur public français" dans Annales du Management. Tome I - Contribution au colloque de l' Association Nationale des IAE. 1992

9 Amintas Alain: "Le management public face à ses outils"- Contribution au colloque de l'Association nationale des IAE - Nany 1992 - Tome II

buée, ...) et une absence de référents économiques, financiers ou sociaux.

Les problèmes de gestion à résoudre sont prioritairement des problèmes englobant des contraintes techniques souvent très complexes qui ne sont pas forcément liées aux exigences économiques et financières du service. Les pressions exercées au niveau politique peuvent jouer à contresens de la logique des choses.

Prenons par exemple l'objectif de permanence du service, un des points de performance du service.

La réalisation de cet objectif passe par la résolution de contraintes au niveau de l'outil de production et de distribution telles que :

- la contrainte de continuité de fonctionnement des ouvrages de production et de traitement;
- la contrainte de dimensionnement du réseau d'adduction et de distribution devant assurer un niveau de débit et de pression minimum et maximal correspondant par ailleurs à un niveau de service (pression) à l'usager;
- la contrainte de capacité du réservoir;
- ...

La solution retenue in fine ne sera pas dans bien des cas,[10] la combinaison technico-économique optimale. L'argument de "prudence" (et de tranquillité) l'emportant sur celui d'un risque "calculé".

Cette illustration, de même l'absence de référents économique et financier au sein des services mentionnée plus haut, reflètent une culture de gestion "technocentriste" qui n'est pas le propre des seuls gestionnaires du secteur de l'eau, mais qu'on retrouve aussi dans d'autres secteurs publics *industriels à dominante technologique*. Il nous semble de plus en plus que le "rôle de l'ingénieur dépasse le technique pour s'étendre au management". C'est là l'une des évolutions marquantes de la gestion actuelle de ces services qui devrait faciliter l'appropriation d'un système d'information dynamique.

3.3 LE MODELE D'ANALYSE : LA REPRÉSENTATION DU SERVICE PAR SES CONSTITUANTS FONDAMENTAUX

L'histoire des systèmes d'information de gestion est riche de leçons car elle nous révèle combien les savoir peuvent s'éloigner de l'action notamment en gestion des organisations où la réalité se conçoit d'abord et avant tout comme une construction sociale faite de schémas de représentations propres à chacun des acteurs. Il en découle non pas "une" *représentation* de la performance à réaliser mais plusieurs niveaux d'interprétations qui peuvent diverger, d'où la nécessité de se pencher en particulier sur ce qui constitue dans la mission de distribution d'eau le coeur de la performance afin de bâtir un *système collectif d'interprétation.*

Le modèle systémique que nous propose JL. Le Moigne, de même l'association transversale par les activités des différents centres de responsabilité telle que nous le propose P. Lorino pour l'élaboration de ce système collectif de valeurs sont, de notre point de vue, des concepts porteurs pour construire ce référent collectif de valeurs.

Le schéma qui suit Fig. 1 - p. 31) donne un aperçu de découpage envisageable des activités pour se représenter les principaux éléments de la mission de service public en question.

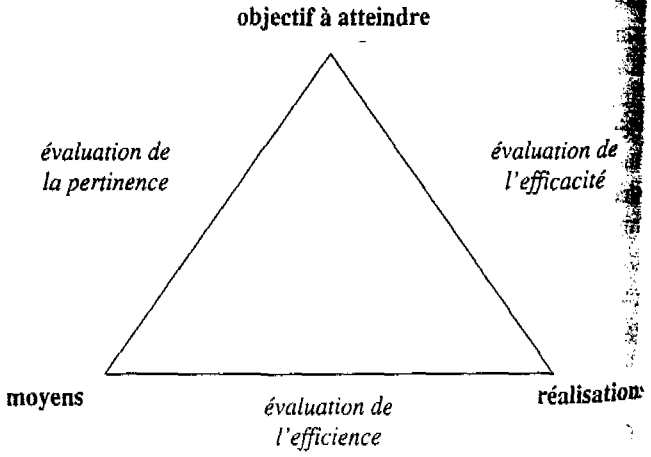
Le découpage proposé ci-contre permet d'identifier au sein de la mission de service public étudiée (considérée comme secteur mono-produit), deux éléments de la mission qui ne sont pas perçus de manière instinctive, que ce soit par l'usager ou par le gestionnaire notamment lorsqu'il s'agit d'analyser la performance du service, c'est en premier lieu la *double composante produit-service de l'activité.*

En second lieu, ce schéma attire l'attention sur *les différents lieux possibles d'expression de la performance* sans a priori de niveaux à privilégier. Par ailleurs, il permet de visualiser la globalité en s'attachant à *connaître les parties du tout.*

Ce premier repérage de la performance qui dans ce schéma n'est que physique, pour être complet demande à être alimenté par les principales dimensions de la performance. Nous en identifions trois essentiellement : la dimension *qualité*, la dimension *délai* et la dimension *coût*, applicables au niveau de chaque niveau d'expression physique de performance.

3.4. LES OUTILS ET L'OBJET DE LA MESURE ?

La problématique de la mesure de la performance telle que nous l'avons évoquée, s'intègre tout à fait dans les principes du *contrôle de gestion* auquel nous "empruntons" les méthodes et les outils pour construire notre système d'évaluation selon le schéma suivant :



10 Notre propos n'est pas à généraliser, il résulte d'un constat établi sur la base de quelques contacts engagés avec le terrain et d'entretiens divers avec d'autres acteurs sur leur vécu de la gestion des services d'eau.

11 Cf Bultel J. et Perez F. " La performance industrielle par la gestion simultanée" 1995.

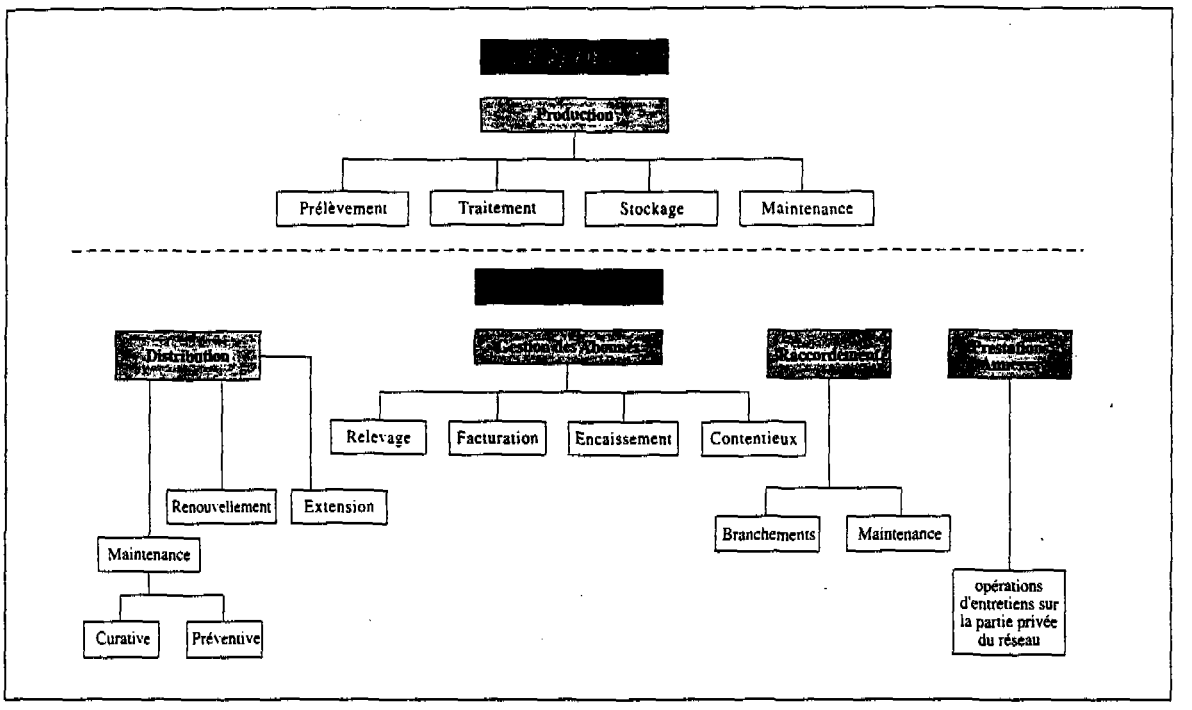


Fig 1 – Découpage par activités de la mission publique de distribution d'eau potable

Les indicateurs de mesure de performance ainsi construits révèlent non seulement l'efficacité du service gestionnaire (confrontation objectif-degré de réalisation), ce qui pose le problème de la *norme* prise en référence pour quantifier l'*objectif*, mais aussi son efficience dans l'utilisation des ressources du service (confrontation réalisations-moyens prévus). Cette double confrontation nous renseignant en outre sur le degré de cohérence existant entre les niveaux d'objectifs fixés et le niveau des moyens du service de manière générale, mais en particulier au sein de chaque "lieu d'expression" de la performance.

4. QUELQUES ÉLÉMENTS D'APPRÉCIATION DE LA PERFORMANCE DU SERVICE DISTRIBUTEUR D'EAU POTABLE

Les indicateurs figurant au sein du tableau II ci-après sont une première esquisse d'application de mesure de performance selon les principes exposés tout au long de notre analyse.

Nous nous situons ici à un niveau synthétique du service. Il convient de souligner que ces indicateurs sont issus de travaux actuellement en cours au sein de quelques services pilotes. Si la démarche de construction est transposable quelque soit le service, la validité des indicateurs n'est établie que pour les services au sein desquels ils ont été élaborés (conditions d'exploitation spécifiques au service).

5. CONCLUSION : PERFORMANCE ET LÉGITIMITÉ DU SERVICE PUBLIC

Il nous semble en résumé de notre analyse que dans le contexte de gestion évoqué, la légitimité du service public de distribution d'eau potable passe plus que jamais par l'intégration dans l'organisation du quotidien, des différents aspects qui définissent la performance globale de la gestion de cette mission. Nous considérons en effet que la recherche de performance est un élément de survie de cette légitimité. Cela est d'autant plus vital pour les gestionnaires publics des services d'eau qui, vis à vis de l'essor de la gestion déléguée, ont à démontrer que le management ne se réduit pas à l'opposition public-privé, mais que c'est avant tout une question d'engagement pour garantir un niveau et une qualité de service à l'usager. Engagement aussi pour un mieux connaître afin de mieux piloter, engagement pour transcender la culture actuelle "techno-centriste" et viser une gestion intégrée du service alliant les différentes dimensions techniques, environnementales, économiques, sociales et politiques de cette mission publique.

Voir page suivante

Tableau II – Tableau synthétique des indicateurs retraçant la performance globale de la mission publique de fourniture en eau potable

Point clé d'évaluation de la performance	Indicateurs de performance	Valeur guide
• satisfaction de la demande	• taux d'interruption du service	à définir en interne
	• volume des réclamations (par nature)	valeur extrême admissible par le service
• fiabilité des infrastructures	• Moyenne de temps de bon fonctionnement du système de production	variable selon service
	• disponibilité opérationnelle de l'outil de production	100 %
	• rendement moyen du réseau (sur 3 ans)	80 % (au moins)
• réactivité v/v de tout événement conjoncturel	• respect des temps de réponse	100 %
• satisfaction des demandes de raccordement	• indice de satisfaction branchement (cf. respect du délai de raccordement et qualité des travaux)	100 % sur le respect des délais selon le service sur la qualité
• non discrimination des usagers	• réflexion en cours	
• potabilité	• taux de conformité des analyses (sur l'année) (bactériologique et sur paramètres en surveillance)	100 % ou valeur extrême admissible par le service
• qualité organoleptique	• taux de satisfaction de la qualité organoleptique (testé par enquête)	valeur extrême admissible par le service
• niveau de pression	• moyenne des niveaux de pression enregistrée sur l'ensemble des puits collecteurs	dépend de la configuration d'alimentation
	• moyenne enregistrée sur le réseau	idem
• maîtrise des délais	• respect des délais (d'intervention, de réaction, de raccordement, de relevage ...)	100 %
• qualité des interventions	• indice de satisfaction des usagers sur la qualité des travaux (testé par enquête)	à définir en interne
• capacité d'investissement	• taux d'endettement	15 %
	• capacité d'autofinancement	à définir en fonction de la stratégie financière du service
	• taux de réalisation des prévisions	se rapprocher du 100 %
• équilibre budgétaire	• maîtrise des coûts" sensibles" (coûts variables énergétiques, coûts variables de maintenance curative, coût de renouvellement...)	à définir en interne
• politique tarifaire adaptée à l'objectif de coût et à l'objectif de développement du service	• taux de couverture du coût de revient par le prix	100 % (au moins)
	• capacité d'autofinancement	à définir en fonction de la stratégie financière du service

6. BIBLIOGRAPHIE

AGHTM (Association Générale des Hygiénistes et Techniciens Municipaux), 75 ème congrès, Mulhouse, mai 1995.

BURLAUD A. et GIBERT P., "l'analyse des coûts dans les organisations publiques : le jeu et l'enjeu", Politiques et Management public, 1984.

DE KERVILLER I., GUERIN SYLVIE, Première approche du service public: distinction entre service public "administratif" et service public "industriel et commercial", Revue Française de Gestion, 246- juin 1993.

GUEDON M.J., Sur les Services Publics, Economica 1982.

GISCARD D'ESTAING A., La gestion publique- Que Sais-je? - PUF 1991.

G.R.E.P - U.N.S.P.I.C, Performance des services publics locaux , Analyse comparée des modes de gestion, Litec, 1990.

LE DUFF R., "Management Public ou gestion non-marchande", Annales du Management, Le Monde du 11 octobre 1995, dossier "A service du public".

Tome I et II - Association Nationale des I.A.E., Economica 1992.

LEON M., TRESSON V., TIQUET R., 45èmes Journées nationales de l gestion des services publics - Génie Urbain - août-sept 1994.

RAYMUNDIE O., Recherches sur la gestion déléguée des service publics (Aspects de droit interne, comparée et communautaire Thèse de doctorat, 1993.

RAYMUNDIE O, Gestion déléguée des services publics en France et e Europe, Le Moniteur, 1995.

THIRY B., "L'évaluation de la performance des entreprises publiques' Working papers. CIRIEC- 1993.

SANTO V-M., VERRIER P-E., Le Management Public, Que Sais-Je PUF, 1993.

VAN DE VYVER P.G., Le service public local, Guide pratique d gestion, Sorman 1989.

IRS & WS Project, Damda/GOI, Tamil Nadu, India

INTEGRATED RURAL SANITATION & WATER SUPPLY PROJECT

SYSTEMS APPROACH FOR THE TRAINING ON PREVENTIVE & BREAK DOWN MAINTENANCE OF HANDPUMPS

INTRODUCTION

Poor water supply and environmental sanitation schemes continue to be critical problems in rural areas despite considerable efforts to improve and expand access to it. Mounting evidence indicates that centrally managed schemes, among others, are difficult to implement and operate when the communities served are scattered, remote and relatively small and lack the financial resources and physical and social infrastructure needed to support and maintain new system. In contrast, locally managed system appears to function reasonably well and to be sustainable. In order to facilitate effective community based water supply maintenance system, the IRS & WS project has proposed to train village based mechanics, financed by users, who will be able to contribute both in preventive and break down maintenance.

OVER ALL GOAL OF THE TRAINING

To enable the Maintenance Mechanics to function effectively in preventive and break down maintenance of handpumps.

TRAINING NEEDS ASSESSMENT

(A) Basic training needs of the Maintenance Mechanics will be identified by developing Task Analysis and discussion with Experts involved in the similar activities.

(B) The training expectations of the Maintenance Mechanics will be assessed through questionnaire and discussion based on the broad objectives set.

(C) The pre entry knowledge and skill of the Mechanics will be assessed through a pre test, objective type questionnaire.

TRAINING OBJECTIVES

The broad general objectives of the training will be set based on the Task Analysis and learning needs established. A set of well defined specific objectives will be developed for each of the General Objective.

RESOURCE PERSONNEL

A group of Resource Persons from TWAD, Project Advisory Group, Block Development Office (Union Fitter and Additional Fitters) and external Training institutions will be involved.

INSTRUCTIONAL METHODS

Class room based lecture sessions will be avoided as far possible. Unstructured discussions followed by demonstration will be used. For practical `hands on experience' the MMs will be divided into small groups and taken for field demonstration and work practice.

TRAINING MATERIALS

The Maintenance Mechanics will be given a detailed manual (in Tamil) covering the key subjects to be covered in the training. Charts, cut section models, transparency sheets will also be used.

TRAINING IMPLEMENTATION

The training duration will be for 6 days (covering approximately 6 hours of theory and practical sessions for each day). The venue of the training will be at Panchayat School buildings adjacent to the handpumps to be serviced and repaired.

TRAINING EVALUATION

(A) Monitoring of the training will be done through daily review of the subjects taught, observation of the practical work and quiz programme.

(B) The final assessment of the training (process and content) will be done through post test questionnaire and discussion.

INTEGRATED RURAL SANITATION AND WATER SUPPLY PROJECT
CURRICULUM DESIGN FOR THE TRAINING OF MAINTENANCE MECHANICS

GOAL: To enable the Maintenance Mechanics to function effectively for preventive and break down maintenance works of the handpumps.

S.No	Major Tasks	Sub Tasks	Content (Knowledge and skill)
1	Creating awareness among the users on the importance of community based Handpump maintenance	* Contacting the user groups regularly *Explaining the users on water borne diseases, safe drinking water & importance of community based handpump maintenance system	Advantages of contacting the user groups, Water & health, source of water. criteria of safe water, factors of water pollution, health hazards of polluted water, safe water and importance of community based handpump maintenance system
2	Facilitating the users on proper use of handpumps and its maintenance.	* Visiting the handpump sites regularly * Observing the usages and maintenance of the handpump by the user groups. * Explaining the user group on the importance of proper use and maintenance of handpumps. * Conducting regular follow up visits.	Importance of regular follow up visit, points to be observed during visit on use and maintehance of handpumps, misuse of handpumps, consequences of misuse.
3	Assisting in the regular preventive maintenance services	* Getting feed back from the User groups about the functioning of the handpump. * Checking the operation of the pump * Completing the preventive maintenance routines. * Recording the preventive maintenance services provided. * Discussing with user group on preventive care of the handpump.	Anatomy of handpumps,functions of different components, servicing of components(S), standard tools and their usage (K&S), preventive maintenance routine (K&S), Dismantling and re-assembling of handpump, (K&S) record keeping.
4	Carrying out necessary break down maintenance services	* Studying the nature of the break down * Identifying the causes for the break down * Determining the corrective repairs to be done. * Repairing the defects identified. * Providing suitable awareness education to the user group to avert the recurrence of defects. * Recording the break down services provided.	Common break downs of handpums, Signs and causes of break downs, Dismantling , repairing & re-assembling of a handpump for common break downs(K&S), information on break down maintenance, record keeping
5	Maintaining up to date preventive and break down maintenance records and reports	* Recording all the preventive and break down maintenance works undertaken. * Reporting the documents to the concerned authorities for further follow up.	Importance of maintenance records, Record: types, formats and filling (K&S), Reporting to authorities.

TRAINING ON PREVENTIVE AND BREAK DOWN MAINTENANCE

TIME TABLE (PROCESS & CONTENT)

Day	Time	Topic	Specific objectives	Methodology	Materials
Ist Day	10.00- 10.45	Registration & Needs Assessment	To complete the registration of the trainees To assess the pre entry level knowledge skill and learning expectations of the trainees.	Individual Work Discussion	Questionnaire
	10.45-11.30	Course Inauguration	To highlight the broad outcomes of the training To have self introduction of the participants and the Training Facilitators.		
	11.30-12.00	Introduction to IRS & WS Project	To explain the goal, objectives, activities of IRS & WS Project. To discuss the strengths and limitations of the existing handpump maintenance system. To discuss the importance of community based handpump maintenance system	Discussion	Handout
	12.00-01.00	Water & Health	To explain the importance of water in health of human being. To list the different sources of water To describe the criteria of safe water To state the factors which pollute water To explain the diseases which spread through polluted water. To explain the merits of collecting water from a handpump To list the types of handpumps installed by the project	Discussion	Handout
	02.00-03.00	Hand Pump: Components and Functions	To name the different components of handpump To explain the functioning systems of a handpump	Lecture Demonstration Group work	Handout Handpump parts
	03.00-04.00	Hand Pump Maintenance Tools	To name the special tools to be used for maintenance work. To state the functions of each of the tool To explain the correct procedures of using the tools.	Discussion Group work Demonstration	Standard & Special Tools
	04.00-05.00	Servicing of Handpump parts	To service the cylinder & head assembly components of a handpump in class room situation	Group Work	Cylinder & Head Assembly
	05.00-05.30	Review	To summarise the major learning experiences gained on the Ist day training	Discussion	--
2nd Day	10.00-10.30	Review	To assess the learning experiences gained on the previous day	Discussion Quiz	Questionnaire
	10.45-12.00	Servicing of Handpump parts	To service the cylinder & head assembly components of a handpump in class room situation	Group Work	Cylinder & Head Assembly

Day	Time	Topic	Specific objectives	Methodology	Materials
2nd Day	12.00-01.00	Dismantling & Re-assembling	To discuss the correct procedures of dismantling and re-assembling of a handpump.	Lecture Discussion	
	02.00-05.15	Preventive Maintenance	To explain the concept and importance of preventive maintenance work To list all the preventive maintenance routine to be carried out for IM 2 Hand Pumps. To list the ways and means of involving the user groups in preventive maintenance work.	Lecture Discussion Demonstration	Handout Tool Kit
		Dismantling & Re-assembling	To demonstrate the correct procedures of dismantling and re-assembling a handpump.	Demonstration Group Work	Practical Work
		Preventive Maintenance	To demonstrate the correct procedures of carrying out the preventive maintenance work .	Group work Discussion	Practical work
	05.15-05.30	Review	To summarise the major learning experiences gained on the 2nd day training	Discussion	
3rd Day	10.00-10.30	Review	To assess the learning experiences gained on the previous day	Discussion Quiz	Questionnaire
	10.45-01.00	Handpump trouble shooting:Causes & Remedies	To list the most common problems and break downs of a handpump To explain the signs and causes of the most common break downs and problems To explain the correct method of dismantling, repairing and assembling a IM2 hand pump when: (a) water level has gone down the cylinder level (b) connecting rod disconnected	Lecture Discussion	Handpump Charts
	02.00.-05.00	Trouble Shooting	To demonstrate the correct method of dismantling, repairing and assembling a IM2 hand pump when: (a) water level has gone down the cylinder level (b) connecting rod disconnected	Demonstration Group work	Practical work at sites Spares/Tool kit
	05.00-05.30	Review	To summarise the major learning experiences gained on the 3rd day training	Discussion	
4th Day	10.00-10.30	Review	To assess the learning experiences gained on the previous day	Discussion Quiz	Questionnaire
	10.30-01.00	Handpump trouble shooting:Causes & Remedies	To explain the correct method of dismantling, repairing and assembling a IM2 hand pump when: (a) valve seating worn out (b) Cylinder cracked (c) leather cup washer worn out	Lecture Discussion Demonstration	Handout Practical at site Tool Kit

Day	Time	Topic	Specific objectives	Methodology	Materials
4th Day	02.00-05.00	Trouble Shooting	To demonstrate the correct method of dismantling, repairing and assembling a IM2 hand pump when: (a) valve seating worn out (b) Cylinder cracked (c) leather cup washer worn out	Group Work	Practical work at site
	05.00-05.30	Review	To summarise the major learning experiences gained on the 4th day training	Discussion	
5th Day	10.00-10.30	Review	To assess the learning experiences gained on the previous day	Discussion Quiz	Questionnaire
	10.30-11.30	Maintenance of Records	To recognise the importance of records & reports To list the different records to be filled by the MM To explain the procedures of filling the records	Lecture Discussion Demonstration	Handout
	11.30-01.00	Record Keeping	To demonstrate how to fill the model records To explain all the key points to remembered in the handpump maintenance reporting	Group work	Model Format
	02.00-05.00	Role of MMs in Preventive & Maintenance care	To list all the five major tasks of a MM To state the responsibilities of MM in (a) preventive & maintenance care (b) tool kit usage (c) charges for the services offered (d) record keeping and collective work To recognise that hard and sincere work is essential for effective handpump maintenance.		Handout
	05.00-05.30	Review	To summarise the major learning experiences gained on the 5th day training	Discussion	
6th Day	10.00-10.30	Review	To assess the learning experiences gained on the previous day	Discussion Quiz	Questionnaire
	10.30-01.00	Revision	To refresh and reinforce the learning experiences gained on the previous days.	Discussion Demonstration	
	02.00-03.00	Post Evaluation	To assess the learning outcome of the training To evaluate the training process	Test	Questionnaire
	03.30-04.15	Concluding Session	To share the training experiences gained in the training and list post training follow up plans.	Discussion	

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WATER SUPPLY & SANITATION COLLABORATIVE COUNCIL

(Some for All rather than More for Some)

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08 February 1996

THE WATER SUPPLY AND SANITATION COLLABORATIVE COUNCIL

I. Background

Considering the socially and morally unacceptable position that billions of people in the world and particularly the poor had no access to safe water and sanitation services, the very basic needs of decent human existence, governments at the United Nations Conference on Human Settlements in 1976 **(HABITAT, Vancouver, 1976)**, made a commitment to "adopt programmes with realistic standards for quality and quantity to provide water for urban and rural areas by 1990, if possible".

The United Nations Water Conference (Mar del Plata, 1977) which followed HABITAT, resolved that governments reaffirm the commitment made at HABITAT (1976) and that governments and the United Nations system assign priority to the related tasks; provide additional support including funds; and collaborate as closely as possible in meeting the objectives. An action plan covering national strategies, advocacy, education, feasibility studies, project designs, funding and institutional arrangements was also approved. Where human needs had not been satisfied, it was recommended that national development policies and plans should give priority to the supplying of drinking water for the entire population and to the final disposal of wastewater.

Following the recommendations from HABITAT and Mar del Plata, the United Nations declared the period 1981 to 1990 as the **International Drinking Water Supply and Sanitation Decade** to help provide the sector the priority, support and attention it urgently needed.

At the end of the Water Decade in September 1990 a global consultation **SAFEWATER 2000 (New Delhi, 1990)** was organized by the United Nations Development Programme, hosted by the Government of India to review the progress made during the Water Decade and to make assessments and recommendations for the future.

The Water Decade had succeeded in harnessing higher priority and more effort and resources for the sector, and increased access to safe water and sanitation. But much still remained to be done and "business as usual" would not suffice - things had to be done differently and better. Stakeholders (particularly women) had to be involved in every aspect of planning, development and operations if installed facilities were to be used effectively and efficiently and sustained.

The following principles were adopted at the SAFEWATER 2000 Consultation for future activity:

- Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes.
- Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions.
- Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes.
- Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies.

(The outcomes of some of the important post Decade meetings is provided as Annex 1.)

II. The Urgency for Collaboration

At the end of the Decade the population without access to safe water and sanitation stood at over a billion - about the same order as at the start of the Decade. Those without access to sanitation services outnumbered those without access to safe water supplies. The accelerated increase in access to safe water and sanitation services during the Decade did not outpace population explosion. Rapid urbanization exacerbated the position with an increase in the demand for such services and at the same time adding to waste and pollution of available water resources. The status of the urban poor in these circumstances left much cause for concern.

The SAFEWATER 2000 Consultation concluded therefore that much had been achieved but much still remained to be done. The current and emerging issues identified were:

(i) Rapid urbanization and an increase in demand for social services and the formation of informal communities which if recognized provided high economic potential and if not and unserved presented heavy social risks;

(ii) Water becoming a limited resource due to increased demand, use and misuse, and waste and pollution;

(iii) The low operating efficiencies and poor sustainability of many of the installed water supply and sanitation facilities and the need for remedial action;

(iv) Most of government equity contributions and subsidies reaching those who have rather than those who don't and an imperative to change this position;

(v) Development funds both external and domestic becoming scarce with increased competition for what is available;

(vi) Inability of governments to continue as providers of services and the need for more partners (communities, non-governmental organizations, private sector) to help and assume responsibility;

(vii) Decentralization an attractive option but unwillingness or inability to delegate or the inability or reluctance to assume delegated responsibility;

(viii) The high level of poverty and concommittant environmental degradation.

A change in approach and attitude at all levels in national organizations as well as in international organizations, was necessary to deal effectively with the above issues amongst others. The new approach had to be people centred to ensure that the services were only what they wanted, and could afford and manage to ensure sustainability - the luxury of resources for the supply and hardware driven approach of the past no longer existed. The new approach required effective communication to achieve amongst all concerned, an appreciation of the value of resources, a high awareness of the issues, the risks of making the wrong choices, and the costs and the benefits. All stakeholders, particularly communities and women, had to be involved in the entire process of selection of service and technology and in implementation and operation along with a concomittant appreciation that success or failure became their responsibility. Such changes needed extensive collaboration at all levels and furthermore, the resource constraints and the need to make the most of available resources made collaboration an imperative.

There were existing arrangements for co-ordination but they had limitations in reaching out to and involving all stakeholders so necessary in the new scheme of things. (Please see Annex 2 for other co-ordination arrangements.) The capacity of these existing arrangements to develop consensus amongst all on ways and means to overcome barriers to progress was therefore limited although they were useful and necessary for co-ordination activities within defined frameworks. The arrangement that came into being at the end of the Decade to enable collaboration at all levels with all the stakeholders involved as required in the new scheme of things, was the Water Supply and Sanitation Collaborative Council. It strives to maintain the momentum of the Decade and bring about consensus amongst all involved in the ways and means to overcome barriers to progress The Collaborative Council in its form and style reflects the changes from Mar del Plata in 1977 to now, i.e. from dependance on UN agencies and centralized arrangements to a much wider participatory approach involving all stakeholders.

III. The Water Supply and Sanitation Collaborative Council

The **Mission of the Council** is to enhance collaboration among developing countries and external support agencies (ESAs), so as to accelerate the achievement of sustainable water supplies, sanitation and waste management services for all people, with emphasis on the poor.

The Collaborative Council is a network of all those interested in water supply and sanitation matters and concerns itself with developmental issues. It is an arrangement for obtaining the best of existing agencies (international and national) and to bring about changes in the way we do things and to do them better through consensus amongst all.

The Collaborative Council is an innovative mechanism which derives its mandate from a UN Resolution (A/45/181 of 1990) - though it is not a UN body. It can therefore call on and derive the best from the UN system. Devoid of bureaucracy, Council meetings are open to sector professionals from national agencies in developing countries, multilateral and bilateral aid agencies, non-governmental organizations, appropriate international research information and academic institutions and professional associations.

The Council meets at two year intervals to provide a forum for exchange of experiences and views and to agree on common approaches for advancing progress in water supply and sanitation. Participants may speak from their own background and experience and provide their considered positions or speak for the parent agency or country as the issue demands. Objectivity is therefore ensured. It is the collective wisdom that is passed on to governments and agencies for their consideration and use. The first biennial meeting of the Council was in Oslo, Norway in 1991, the second in Rabat, Morocco in 1993 and the third in Bridgetown, Barbados in 1995. The Fourth Forum will be in Asia in 1997.

Between these fora specialist Working Groups and Task Forces develop proposals for improving the sectors' performance at national and international levels in key issue areas. These Working Groups and Task Forces are international in composition, and are made up of volunteers from those who work on such issues nationally or internationally in their normal course of duties. The benefit is a greater ownership to the tools (ways and means) developed to overcome barriers. The Council has been working on issues such as: Services for the Urban Poor; Country Level Collaboration; Operation and Maintenance; Applied Research; Gender Issues; Communication and Information; Promotion of Sanitation; Water Pollution Control; Institutional and Management Options and Needs of Portuguese-speaking Countries in Africa.

Through the Asian Development Bank, it promoted regional consutations on "Water Supply and Sanitation Beyond the Decade" and on "Managing Water Resources to Meet Megacity Needs in Asia". Many workshops have been held under the auspices of the Council on Services for the Urban Poor; Operation and Maintenance; Information Management; Country Level Collaboration; information and training needs of the Portuguese speaking countries in Africa.

At the recently concluded Third Global Forum of the Council in November 1995, the Council undertook the following additional activities to be carried out through international working groups and task forces:

1. Community Management and Partnerships with Civil Society
2. Country Level Collaboration and National Sector Strategies
3. Water Demand Management and Conservation
4. Decentralization
5. Advocacy and Dissemination Strategies
6. Emergency Measures in the Water Supply and Sanitation Sector
7. Issues of Small Island States
8. Water Supply and Sanitation Development in Africa
9. Issues of Central and Eastern Europe and the Commonwealth of Independent States

The Council Forum identifies areas where a lack of consensus is a hindrance to progress; reviews the recommendations made by the working groups and task forces; and looks at emerging issues which require attention. The forum also provides opportunity to agencies to obtain wider ownership of progressive concepts and ideas leading to greater acceptance particularly at the country level. Some of the tools (guiding principles, strategies, guidelines, manuals, source information, etc.) produced by the Council are already being adopted in their existing form. The Council is, however, working towards producing them in a form, language and presentation to suit the different audiences (communities, policy/decision makers, managers, practitioners, etc.) Information on water and environmental sanitation on the Internet is still scattered and hard to find. To rationalize and organize such electronic networking, the Council members established in late 1995, a home page on Internet for Water Supply and Sanitation under the umbrella of the Council. This was developed with the expectation that it will progressively be used and supported by all interested organizations and persons in the sector.

IV. Benefits of Collaboration[1]

In the past, collaboration has often been hindered by the desire of individual agencies/ministries to safeguard their territorial interests.

During the 1980s, in a world of central planning and vertical programming, there was reluctance to undertake multi-agency projects or create horizontal linkages. With the greater recognition today that there are a large number of stakeholders in the water supply and sanitation sector and that decision-making is best devolved to the local level with government support, there is a need for greater decentralisation and partnership not only among ministries but also with community groups, the private sector and NGOs. It is, therefore, critical for each player in the sector to appreciate the need for and benefits resulting from collaboration as a means of improving performance.

Summarising the case for collaboration:

- Collaboration is good politics.
  It increases public perception of enhanced sectoral priority, of improvement in the quality of governance and of the accountability of government in problem resolution. It is useful, indeed essential, to the decentralisation process where the voice of local government, communities and the consumer must be heard for effective programming. It can contribute to social mobilisation, as a vital element in the partnership approach.

- Collaboration will achieve more for less.
  It helps to avoid waste of resources in duplicate efforts and in the application of inappropriate technology or approaches, where proven solutions have already been found. It also enables joint monitoring and evaluation, thereby providing for a more efficient and rapid feedback.

- Collaboration leads to sustainable progress.
  Community development based on a partnership approach between both men and women of the community, implementors and support agency staff is an essential condition for sustainable development.

- Collaboration can resolve conflicts and promote integration.
  With so many players, water supply, sanitation and the environment sectors are fraught with conflicting policies and priorities, duplication of effort and even competition among agencies. Coordination is essential if optimal use is to be made of scarce resources. Integrated water management, a central theme in environmental management, cannot be accomplished without strong inter-agency collaboration.

- Collaboration encourages collective efforts, with enhanced benefits.
  Good co-ordination between water, health, education and environmental agencies results in better utilisation of the water and sanitation facilities and greater benefits through improved hygiene and sanitation in the home and community environments.

- Collaboration helps in the mobilisation and deployment of resources for sector "public goods" like strategic investment plans, data bases, research and development, information and networking mechanisms, etc.

It is at the country level at which collaboration is generally considered to be most useful for development of the water supply and sanitation sector.

V. Conclusion

People and water are partners for life.

The results of actions become more sustainable when the community is sharing ideas and experiences with the programme planners and is involved in all aspects of the process of development.

There are competing demands for limited resources and we must make the most of what we have. In a resource constrained environment, collaboration represents the most if not the only viable option.

Collaboration can be good politics: it can promote the process of social mobilization and decentralization. Collaboration achieves more for less, leads to sustainable development, resolves conflicts and promotes integration, and encourages collective efforts with enhanced benefits. Collaboration helps in the mobilisation and deployment of resources for sector "public goods" like strategic investment plans, data bases, research and development, information and networking mechanisms, etc.[1]

There are good examples of collaboration taking place at all levels. The widespread use of collaborative mechanisms is not yet well established and needs to be promoted. The Water Supply and Sanitation Collaborative Council has developed guiding principles for good collaboration and identified many useful/mechanisms which have been successfully adopted for dealing with many aspects of sector development more effectively. (Please see Annex 3.)

The Council enjoins all those interested and committed to achieving progress in the water supply and environmental sanitation sector and in particular in developing such services to the unserved, to collaborate to obtain the most from available resources in a sustainable way and to ensure "some for all rather than more for some".

References:

1. Chapter 5 on Collaboration by Dr Hafiz Pasha, for the Ministerial Conference on Drinking Water and Environmental Sanitation, March 1994, Noordwijk, the Netherlands.

Annex 1

Water Supply and Sanitation Collaborative Council

OUTCOME OF IMPORTANT POST DECADE MEETINGS

The International Conference on Water and the Environment (Dublin, January 1992). Leading up to the "Earth Summit" in Rio, this Conference proposed the following guiding principles for consideration at the Earth Summit:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good.

The Earth Summit (Rio de Janeiro, June 1992). The "Earth Summit" re-emphasized the importance of and the need to care for water and for achievement of universal coverage in safe water supply and sanitation. Nearly all chapters of Agenda 21 (22 to be precise) have references to water management, demonstrating that water activities cannot be isolated but dealt with through interaction and collaboration. Agenda 21 stated that:

- for sustainable development, collaboration is necessary amongst all partners;
- the planning and implementation of drinking water and environmental sanitation programmes should be in the context of an holistic water resources development framework, taking an ecosystem approach to water resources development and management, including the health dimension;
- capacity building is a fundamental activity to create competent institutions, to provide adequate numbers of qualified staff, to equip all the stakeholders and to enable communities to become full partners in the development of the sector; and
- in order to enable drinking water supply and environmental sanitation facilities to operate on an economically sound basis, it is critical to aim for the most efficient effective use of available funds, particularly in view of the increasing global demand for drinking water and environmental sanitation and the trend towards decreasing availability of external funds for the sector.

Ministerial Conference on Drinking Water and Environmental Sanitation (Netherlands, March 1994). The Conference which was a follow-up on the Earth Summit prepared an Action Plan to operationalize the recommendations from the Earth Summit on Water Supply and Environmental Sanitation. The Action Plan was later endorsed by the United Nations Commission on Sustainable Development, and carried the following recommendations related to collaboration:

a. The international community was urged to

- request the UN Commission on Sustainable Development to consider how existing institutions can provide regional clearing houses for the exchange of data and information and how to strengthen the

role of development cooperation and other support funds for drinking water and environmental sanitation; and

- promote and stimulate the role of, and the interest shown by, UN Regional Commissions in the field of water and environmental sanitation, without prejudging the outcome of the on-going decentralization process under the responsibility of the Secretary-General;

b. Recognizing the positive contribution of the Water Supply and Sanitation Collaborative Council as a global forum and a partnership among professionals from countries and external support agencies, non-governmental organizations, professional associations and information, research and academic institutions, recommended that assistance be provided for strengthening the Council and enhancing its advocacy role.

c. That the UN Commission on Sustainable Development, at its second session, considers the need to strengthen the existing mechanism for the co-ordination of activities of the UN system in the field of water resources with a view to help implementing the Action Programme adopted by the Conference, taking into account the primary responsibility of the Secretary-General for interagency co-ordination; and that the Commission on Sustainable Development recommends ECOSOC to consider this issue at its co-ordination segment in 1995;

d. International support agencies were invited to encourage the Water Supply and Sanitation Collaborative Council, in association with interested public bodies and non-governmental organizations concerned, to undertake necessary studies toward strengthening its activities and when appropriate, to take necessary steps for expanding its activities or establishing itself as a more comprehensive world water forum or Council involving the various aspects of water sector, and also encourage the Council to submit its report to its members by April 1995 on any progress achieved on this issue.

Annex 2

Water Supply and Sanitation Collaborative Council

OTHER GLOBAL CO-ORDINATION ARRANGEMENTS

In addition to the Water Supply and Sanitation Collaborative Council, some of the more important existing arrangements for Global co-ordination/collaboration of the water supply and sanitation sector are the following:

A. The Subcommittee on Water Resources of the United Nations Administrative Committee on Co-ordination (ACC)

The ACC is the highest co-ordinating body in the UN System and reports to its Economic and Social Council (ECOSOC). The ACC in turn established a Subcommittee on Water Resources as the co-ordinating mechanism among the UN agencies and bodies involved in water resources development to report to the ACC on:

(i) General (UN) system-wide co-ordination in the field of water resources;

(ii) Identification of emerging issues and formulation of policy guidelines for the UN system;

(iii) Formulation of Common Strategies and Joint Programmes and activities among the organizations of the United Nations System;

(iv) Assistance in the preparation of analytical reports to intergovernmental bodies;

(v) Systematic exchange of information on work programmes and activities of the organizations of the UN system;

(vi) Enhancement of Water Resources Development and Management at the country level including co-ordinated approaches by the organizations of the UN system;

(vii) Cooperation with organizations outside the UN system;

(viii)Raising awareness of the importance of water resources.

The Subcommittee meets once every year. The Department of Policy Co-ordination and Sustainable Development (DPCSD) of the UN acts as the Secretariat. The members are: DPCSD, UNESCO, UEP, UNDP, UNICEF, FAO, the World Bank, WHO, HABITAT and the Regional Economic Commissions of the UN. The Collaborative Council and the International Centre for Water and Sanitation (IRC) are also invited.

B. The United Nations Steering Committee for Water Supply and Sanitation

The Committee was a response to the Mar del Plata Conference to strengthen co-ordination among the agencies and bodies of the UN. And during the water Decade it co-ordinated with the ACC. In 1994 it became a Task Force of the ACC Subcommittee on Water Resources with specific responsibility for water supply and sanitation activities of the subcommittee. The membership of this Committee is the same as that of the ACC Subcommittee on Water Resources and meets once a year, back-to-back with the ACC Subcommittee.

C. The UNDP-World Bank Water and Sanitation Program

This program was established at the beginning of the International Drinking Water and Sanitation Decade as a response to the Water Decade call and was initially actively involved in developing low-cost technologies to reduce costs and sophistication in maintenance and to help accelerated development. It is now involved very much in developing approaches that will lead to sustainable water supply and sanitation sector development. It has been a happy marriage between the UNDP and the World Bank in the water supply and sanitation sector. The Program works through 4 regional water and sanitation groups (RWSGs), two each in Asia and Africa and a network in South America and covers at present, about 26 developing countries. It is supported by many bilateral aid agencies. It has succeeded in providing the World Bank with valuable inputs to reformulate policy and approaches for sustainable water supply and sanitation development.

D. The International Water Supply Association (IWSA) and the International Association on Water Quality (IAWQ)

The IWSA and IAWQ represent the professionals in the water supply and sanitation sector. These associations meet regularly regionally and globally and collaborate very much on technical matters and have also been effective for information exchange and for making useful contacts for collaboration.

Annex 3

Water Supply and Sanitation Collaborative Council

GUIDING PRINCIPLES FOR COUNTRY LEVEL COLLABORATION (CLC)

The Collaborative Council identified country level collaboration as being a prime requirement for the successful development of the water supply and sanitation sector.[1] The Council set up a working group which reviewed experience through case studies carried out around the world and developed guidelines on the most appropriate ways of achieving effective collaboration at the country level. Some of the salient findings and the mechanisms for collaboration identified are enumerated below.

A. General Principles[1]

(i) Providing sustainable services to the people should be the fundamental objective;

(ii) The constantly changing circumstances (political, financial, institutional, etc.) need to be understood by all participants so that CLC activities can remain relevant and realistic;

(iii) External and domestic support agencies (ESAs and DSAs) must understand and emphasize the "supportive" nature of their role - water supply and sanitation problems are owned by the local people and their institutions;

(iv) The nature and type of ESA involvement in CLC in each specific country should reflect their degree of participation in the sector;

(v) Sharing resources in maximizing benefits and minimizing cost enhances CLC;

(vi) Good CLC depends on good communication and mutual trust between people in the process and CLC efficiency is enhanced when there is continuity among key players;

(vii) Successful CLC activities are often due to the initiatives of a few key people, who are perceived to be relatively neutral;

(viii) CLC is complex with different linkages (horizontal, vertical and in-between) and this needs tobe analysed and understood for effective CLC.

B. Overall Sector Co-ordination

(i) Collaboration will only take place between parties which perceive a net gain from doing so. Complementarity of needs enhances collaboration.

(ii) Effective co-ordination is best achieved through providing a service in collaboration with sector actors, rather than through control.

(iii) The co-ordinating body should not only be perceived to be neutral and not subject to the principal government agency or ESA for the sector, but should also really be so.

(iv) A responsive and capable secretariat and especially one that is independent and enjoys the respect and support of the principal sector agencies and ESAs is an important asset to the co-ordinating body.

(v) The co-ordinating body can play an important role in increasing the legitimacy and responsibility of those it attempts to co-ordinate by endorsing their policies and roles.

C. External Support Agency -Government Co-ordination

(i) Consultation meetings are best held in an informal atmosphere with social interaction and frank exchange of views;

(ii) They are most effective as a series rather than one-off. Reliable funding for a series of consultative meetings is essential.

(iii) Whilst commitment is seldom possible during consultation, participants in positions of authority are desirable for credible representation of institutions to facilitate follow-up on informal agreements.

D. Sector Planning and Strategic Investment Planning

(i) Sector planning involving the communities, NGOs and local government enhances collaboration;

(ii) Windows of opportunity are presented when governments undertake new overall policy initiatives such as for poverty alleviation, decentralization, etc. to have sectoral policy changes discussed and approved and additional funds needed obtained;

(iii) Strong ESA influence is to be avoided..

E. Programme and Project Planning and Implementation

(i) The commonly used arrangements for co-ordination are Steering Committees but as far as possible, they should be limited in numbers to those relevant to the project.

(ii) Project implementation usually needs the collaboration of several bodies and groups and transparency of project details will help develop understanding and trust amongst collaborators.

(iii) Secondment of personnel between government departments is a valuable form of resource sharing which builds horizontal links between organizations.

(iv) NGOs are valuable assets to sector development and collaboration. Workshops and joint participation will break down barriers and create mutual respect.

(v) Due attention must be given to the needs and objectives of all partners. Sensitive issues (political objectives and mandates) merit due attention.

F. Issues Resolution/Problem Solving

A Task Force is a useful collaborative mechanism for resolution of an issue or for problem solving. It is time defined; task oriented and focused; and low profile. The objectives, interests and perspectives of each collaborator can be directly addressed and made more accountable.

G. Informal Collaboration

Both formal and informal collaboration are essential to the smooth operation of the sector. Informal collaboration builds on long standing relationships between sector professionals and can cut through bureaucratic red-tape and build horizontal linkages between institutions. Friends can resolve seemingly

insurmountable difficulties. Examples - old school network or batchmates; social events amongst professional colleagues; and professional association meetings.

H. Some Mechanisms for Collaboration[1]

- Formal and informal sector coordination bodies on which all concerned parties are represented: government and non-government organizations, community representatives and (rarely in the past, but certainly recommended in the future) professional and trade associations, in planning, budgeting, project selection, in ways which ensure accountability to the consumer.

- Regular donor-sponsored consultations at central and project levels, which provide a broad overview and plans for sector development (institutional, service levels, financing, community management, and maintenance) over the long term.

- Project steering committees representing the interests of all parties to the process before and during project implementation.

- Task forces created to resolve specific issues.

- Sector information and resource centres and data banks responding to the information needs of the entire sector.

- Local, regional and national fro through which community organizations, NGOs and local bodies (formal and informal) can express their views and be heard. These fora can be effective means of ensuring that the voice of consumer is heard. Thailand has good examples of such fora which are active in environmental affairs and in supporting sustainable local development projects.

- Professional associations which support quality control through the maintenance of professional standards, and also act to introduce new concepts and approaches to the sector.

- Demonstration projects for testing new technologies or implementation methodologies.