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SUSTAINABILITY OF WATER AND SANITATION SYSTEMS

Pump and engine maintenance scheme

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DODOMA REGION COMPRISES of four districts, namely; Dodoma Municipality, Dodoma Rural, Mpwapwa, and Kondoa. There are more than two hundred deep boreholes in the region, served by various diesel engines and pumps.

In much of Dodoma region there is no alternative water resource to the deep water aquifer, and these boreholes are therefore the appropriate technology choice.

Since installation in the 1950's to 1970's many of them have fallen into disrepair. This is attributed to among other things inadequate financial resources, old age, theft, vandalism, lack of responsibility by the consumers, and failure of some sources.

In the past O & M was provided for by the Government and the villagers tended to assume that the government had unlimited resources. As the government failed to allocate adequate financial resources, many of the schemes broke down.

The Regional PEMS Scheme aims at promoting a sense of community based self management and self financing of water supply schemes. The scheme has been made possible by the provision of logistical and financial support from the UK charity WaterAid.

PEMS in Kondoa district

Role of regional PEMS

At a regional level, a Mechanical Engineer and a Training Coordinator were responsible for providing training to the PEMS staff in the four districts, and are the backbone of follow-up support.

Training of the district PEMS trainers concentrated on participatory techniques, communication skills, community motivation and mobilisation, teaching and training techniques and a technical refresher course.

Role of district water department

The Department is responsible for:

- Selection of district trainers, based on technical competence, communication skills and decision-making ability.
- Regular supervision of PEMS activities.
- Preparation of cost estimates for any maintenance required.
- Providing a mobile maintenance service for substantial repairs which are beyond the capabilities of the villagers.
- Provision of spare parts, pumps and engines.

- It is projected that private contractors will undertake some maintenance activities in the future and it will be the role of the Department to supervise this work.
- In the future periodic pump testing of boreholes and monitoring of water quality will be undertaken.

Role of villagers:

Under the borehole rehabilitation programme villagers have to provide all labour as well as financial contribution of not less than Tshs. 200,000/= (UK£ 222.2).

In addition villagers are also responsible for:

- Election of a Water Committee (WC) and opening a bank account for the Water Fund.
- Selection of two pump attendants.
- Purchase of service tool kit.
- 250 hour service for engine.
- Selection of watchmen and provision of watchmen house.
- Security around pump house.
- Payment of full costs for all operation and maintenance needs.

Role of PEMS technicians

The first role was to train Village Pump Attendants on:

- General cleanliness of pump house, surroundings, pump and engine.
- General service of engine like changing of filters, oil, etc.
- Carrying out minor repairs.
- Use of log books.
- Reporting procedure.

Six two week seminars to a total of 71 village pump attendants (VPA) from 37 villages.

Two PEMS trainers have been appointed to visit villages under PEMS programme, using two motorbikes provided by WaterAid and the Kondoa Integrated Rural Development Project (KIRDEP) which is a Dutch funded programme.

These technicians visit every month during dry season and every two months during wet season. During a visit they complete a checklist of activities which includes the following:

- Check performance/logging of village pump attendant.
- Advise village water committee on the service/maintenance requirement of their scheme.

- Inspect their water installation.
- Availing to them required spare parts as per price list the District Water Engineer has circulated to them.
- Advise on pricing-tariff structure, and accounting.

PEMS shop

To facilitate smooth running of the PEMS, a PEMS shop has been established at the Water Department's store with a view to stocking the required spare parts for the engines.

A buffer stock of spare parts for the shop were provided by WaterAid. The sale price has been set to allow for a net profit to compensate for inflation and if possible to increase the stock of spares available.

In the future the Water Department is intending to include other items like parts for hand pumps and pipe fittings in the shop stock.

District bank account

Two bank accounts have been opened, one for the PEMS shop and the other for the villages monthly contributions.

The PEMS Shop account is a revolving fund, that is, the money that accrues from the sales is used to purchase replacement stock.

The second account of monthly village contributions, caters for a payment of mileage and allowances for the PEMS motorbike technicians.

Problems and solutions

In carrying out PEMS, problems have been experienced. Below are the main problems experienced and attempts/plans made to overcome them.

Ownership/duty of care

Ownership is not well defined in the Water Policy.

Poor care of the equipment by some villages has raised concern over the 'duty of care' required of the villagers.

To address this problem, a contract of agreement between the Water Department and the Water Committee, detailing the roles and responsibilities of each party is being prepared.

Failure by the village to fulfill the requirements of the agreement will result, as a last resort, in the nullification of the village ownership of the scheme, and the equipment will then be repossessed by the Water Department.

Miss-use/theft of water fund

Money from the Water Fund has been miss-used and stolen on a number of occasions, with the result that there was no money available to service and run the water project.

This can be resolved by enacting already legislated bylaws, and the Department is striving to ensure the enforcement of these bye-laws by the authorities.

Retrenchment exercise

Recently the Government of Tanzania retrenched around fifty thousand civil servants. The Kondoia Water Department Staff was reduced from 120 to 40 in July 1993.

Those retrenched included all the Government Village Pump Attendants (58), putting pressure on an acceleration of the PEMS training to fill the gap. This pressure to train led to reduced follow-up support during the training period.

In the PEMS team two technicians were retrenched, leaving only two technicians. To fill the gap we recruited two craftsmen who were formerly pump attendants. Having been trained on the job coupled with seminars these craftsmen are now doing a good job.

PEMS spare parts more expensive

It has come to our notice that some of the spare parts are cheaper in the private shops than in the PEMS shop. This is due to the fact that following trade liberalization spare parts come from all corners of the globe, many of which are not genuine, and are poor quality.

The PEMS technicians inspect the quality of these parts, and if of poor quality, they try to educate the villagers poor quality parts will damage their engine and shorten the life of the machine.

Worn out pumps and engines

Some of the engines and pumps are worn out due to age and obsolescence. Breakdowns are frequent and parts difficult to procure.

Under the WaterAid and KIRDEP programmes old engines and pumps will ultimately be phased out, and wherever possible the new equipment will be standardised.

Wet season sources

During the wet season many of the villages resort to their traditional sources (as they are free of charge). These sources are often highly polluted.

In an attempt to solve this problem we are planning to protect seasonal water sources, with ring wells, promote rainwater catchment, and build infiltration galleries in seasonal rivers.

Concluding remarks

There are now 22 boreholes with diesel engines and pumps operational in the district, with six more rehabilitations/ refurbishments scheduled this year.

With the promotion of PEMS, its financial independence of external finance, the sustainability of what in the past has been a 'difficult' village level technology has now been improved.

We believe that with integrated approach being adopted in Kondoia, and the development of the PEMS, the goal of "providing access to clean and potable water...by the year 2002 and that the services so provided are sustainable" (Kikwete, 1993) is for Kondoia District not beyond hope.

References

J.M.Kikwete, Minister for Water, Energy and Minerals, Tanzania, September 1993. Opening address at Workshop on Implementation of National Water Policy.