



## Hand pump performance monitoring (HPPM)

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THIS PAPER PRESENTS a monitoring concept that has been introduced at the Volta Region Community Water and Sanitation Programme (VRCWSP) in Ghana. The aim of this monitoring concept is to provide information that will enable stakeholders to establish an overview of “how many hand pumps are in working condition at any given time?” The design concept has been to keep it as simple as possible to ensure a clear answer to the above simple question.

### Setting

The VRCWSP is the responsible agency for community water supply in the Volta region.

The development objective of VRCWSP is:

*Better living and health conditions for the population in the Volta Region through provision of reliable and easily accessible sources of safe drinking water managed by the communities themselves, and through a reduction in water and excreta related diseases through adoption of hygiene practices and improved sanitary installations.*

In addition to what is needed to fulfil the above development objectives, the VRCWSP also includes a comprehensive capacity building programme. Since 1994 the VRCWSP's main external support agency has been DANIDA.

The national organisation for community water supply - Community Water & Sanitation Agency (CWSA) - is organised with a Head Office in Accra and 10 regional offices of which the VRCWSP is the Volta Region office.

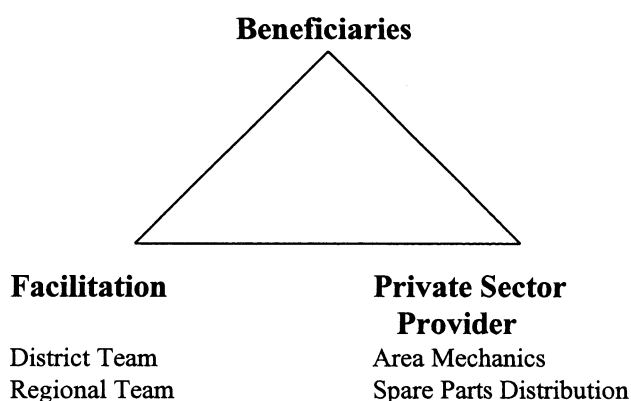
To facilitate the government decentralisation process, the VRCWSP has supported the establishment of 12 District Water and Sanitation Offices – one in each district. The respective district assemblies manage these offices and the attached team.

VRCWSP concentrates its activities in communities with populations of less than 5,000. The water supply part of the programme has achieved 50 per cent coverage in the Region equal to 300,000 beneficiaries. It has constructed and rehabilitated:

- 1000 boreholes with hand pumps and
- 80 piped born water supply schemes

Operation and Maintenance of hand pump facilities is the responsibility of the individual community. The private

sector is functioning as the service provider and the VRCWSP is facilitating the process, as illustrated below:



The VRCWSP has built up the capacity of the area mechanics through a training programme that has provided them with the necessary skills and they have also been given a comprehensive tool set. (The tool set belongs to the District Assembly and will have to be returned to the District when an area mechanic is no longer performing his duty).

Spare part distribution has been contracted to the hand pump supplier to ensure that spare parts will be available for sale at an agreed price at five outlets within the region at any given time. This arrangement is based on a five-year contract. When the contract expires it is expected that the sale of spare parts will have become attractive enough for the private sector to take up the challenge without any external support.

Ghana has standardised on four types of hand pumps: Ghana Modified India Mark II, NIRA 85, Vergnet and the Afridev. The Volta Region is concentrating on two of them; namely the Ghana Modified India Mark II and the NIRA 85.

### The monitoring system

#### Objective:

The objective of the HPPM Concept is to provide information to relevant stakeholders about the performance of the installed facilities.

#### Concept:

The concept has deliberately been kept simple and is concentrating on providing information about how many

pumps are in working condition at any given time. It should be pointed out that the concept is not aiming at providing information on any reason for performance shortcomings.

### Monitoring organisation:

The Environmental Health Assistants (EHA) carries out the actual monitoring. EHAs are Department of Health staff that are seconded to the District Water and Sanitation team. EHAs are organised at grass root level and they are the programme's link to the individual communities. They are responsible for community mobilization, and promotion of water, sanitation and hygiene messages.

The actual monitoring is planned as an exercise that is carried out when the EHA is visiting the community with installed facilities. The monitoring takes place once every quarter.

Each EHA is equipped with a bucket with a scale, making it possible to measure the volume of water in the bucket.

### The monitoring cycle:

The monitoring cycle includes a pump test and a leakage test.

The **pump test** measures how much water a given number of strokes gives. This gives an idea of the condition of the piston seal, whereas the **leakage test** gives an idea of whether there are any leakages in the system coming from weak foot valves, pipe perforation or non-tight joints.

The EHA performs the actual monitoring by conducting the following:

- Operate the pump until water comes out of the spout
- Place the bucket under the spout and then pump 40 full strokes.
- Measure the volume pumped.
- Let the pump be idle for five minutes and
- Count the number of strokes needed to pump before water comes out of the spout again.

Basically that is all.

The EHA receives pre-printed forms from the Regional MIS office. They include all the necessary basic information to be able to identify the installation in question. The EHA has to fill in the following:

- Date of the visit
- Volume pumped and
- Number of stroke(s) needed to be pumped.

### Data handling:

At district level the District Team quality assure the collected data and forward the results to the regional office. At the MIS office of the regional office data are entered into a simple EXCEL spread sheet format. Again intentionally, the system has been kept simple. A few EXCEL macros help to determine which of the below performance rating categories each installation falls into. Analysing the results is done manually; in this connection the EXCEL sorting facility is quite helpful.

For analysing purposes, a set of criteria has been introduced. They are as Table 1.

Furthermore pumps have been divided into installation categories as follows:

- New installations – defined as new hand pumps installed on new boreholes by VRCWSP during the first and second phase of the Danida support;
- Rehabilitated installations – same definition as above but the pumps are installed on existing boreholes and finally;
- Existing hand pumps – defined as pumps installed before the above-mentioned first and second phase.

### Evaluation and communication of results

The purpose of this monitoring exercise is fulfilled only if the result is communicated to relevant parties, and relevant parties take necessary action. Therefore communication is an essential part of the HPPM activity. It is important that the analysed results are communicated to both the district office and the respective communities. At district level initiatives have been taken to ensure that at the monthly planning meeting there is discussion of the latest HPPM result and necessary action is taken.

### Status

The HPPM was field tested in May 1999 and is now fully introduced. Currently more than 1,000 installations are being monitored every quarter. Initially, introducing the system and ironing out any misunderstandings were the main concern.

The following has been achieved:

- 72 EHAs have been trained and are carrying out quarterly monitoring;
- Districts quality assure the incoming data and submit it to the Regional Office;
- At the Regional Office data are being computerized and analysed;
- The analysed results are communicated back to the District and to the communities;

**Table 1. Handpump performance test**

Handpump Performance Test Rating Parameters		
Category	Pump Test	Leakage Test
OK Condition	$\geq 10$ ltrs	$\leq 5$ strokes
Poor Performance	$< 10$ and $> 3$ ltrs	$> 5$ and $< 10$ strokes
Broken Down	$\leq 3$ ltrs	$\geq 10$ strokes

- The bodies responsible for operation and maintenance have started to use the results from the monitoring exercise;
- A programme is under finalisation that will determine the yield of boreholes where hand pumps have been installed. It is essential to be able to distinguish between poor performance as a result of low yield and/or a problem with the hand pump.

### Further development

As mentioned several times previously, the concept has intentionally been kept simple. When results show that the concept is working and that it provides a correct result, one can consider further developing the concept.

The programme has a number of issues in mind.

- It may be considered to develop a more sophisticated data handling programme;
- Asking communities or selected communities to provide information regarding running cost of the installed facility and the monthly water fee collection is also options considered.

Furthermore the Programme will, in the near future, launch a Support Unit to the hand pump operation. The main purpose of this unit will be to assist area mechanics that are facing problems beyond their capacity (fishing out dropped components), carry out refresher training, and what is important in connection with the HPPM, carry out QA of provided data. The unit will spot check that provided information is reliable.

It is the expectation of the Programme that after some time, the HPPM activity will be managed solely at district level and only the final results will be communicated to the regional office.

The pump test and the leakage test are so simple that the community itself should be able to carry it out, and thereby introduce self monitoring of the condition of the installed facilities.

The criteria used for determining the condition of a pump is set up specifically for the Programme. However, the Programme would like to support and be involved in setting up a Global standards for what should be the performance expectation of a correctly installed hand pump.

### Lessons learned

It is important to spend sufficient time with the people doing the monitoring in the field to ensure that any misunderstanding is being ironed out. What may look like a simple question to the designers, when asked in the field, could be misunderstood if being asked by an “outsider”.

### Conclusion

After operating for more than one year, the HPPM has proven to be a tool that can meet the expectations. It provides the stakeholders with a clear picture of where installations are not performing to standard and action can be taken.

Finally the VRCWSP is currently working on developing a similar simple monitoring system for all the pipe schemes installed within its area.

Copy of the used EXCEL spread sheets can be obtained from Bent Kjellerup, at the following e-mail address: [bkj@africaonline.com.gh](mailto:bkj@africaonline.com.gh)

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