Loughborough University

This item was submitted to Loughborough's Research Repository by the author.
Items in Figshare are protected by copyright, with all rights reserved, unless otherwise indicated.

Challenges of O&M in the sustainability of rural water facilities

PLEASE CITE THE PUBLISHED VERSION

PUBLISHER

© WEDC, Loughborough University

VERSION

VoR (Version of Record)

PUBLISHER STATEMENT

This work is made available according to the conditions of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) licence. Full details of this licence are available at: https://creativecommons.org/licenses/by-nc-nd/4.0/

LICENCE

CC BY-NC-ND 4.0

REPOSITORY RECORD

Nedjoh, John, Jens Thogersen, and Bent Kjellerup. 2019. “Challenges of O&M in the Sustainability of Rural Water Facilities”. figshare. https://hdl.handle.net/2134/29326.

29th WEDC International Conference Abuja, Nigeria, 2003

TOWARDS THE MILLENNIUM DEVELOPMENT GOALS

Challenges of O&M in the sustainability of rural water facilities

John Nedjoh, Jens Thøgersen and Bent Kjellerup, Ghana

REDUCING BY HALF the number of people without access to safe drinking water by 2015 is one of the cardinal millennium development goals set by the United Nations. It is on record that 38 percent of Africa's population does not have access to safe drinking water. However, one should be mindful of the fact that most statistics on served populations make reference to national census of populations which have been given water supply in the past. Such statistics do not usually reflect whether the facilities could produce water or not. What comes to mind immediately is the need for increased investments in water supply to the un-served population.

In galvanizing action towards the realization of this millennium development goal, it is easy to overemphasise new water projects across the world to the neglect of sustaining already completed ones. It is important to understand that coverage of water supply will not increase if already existing water schemes continue to break down helplessly.

Effective and efficient Operation and Maintenance (O&M) therefore become critical to the global effort of increasing the number of people served with potable drinking water. Many water projects especially in Africa and other developing countries, though expensive to construct have been virtually mismanaged by the beneficiary communities. Meanwhile, it is normally assumed that O&M is the responsibility of the community whilst the government plays only a facilitative role through the Regional and District Offices. Ghana like many African countries is predominantly rural with more than 68% of its population resident in the countryside. These are the most deprived in terms of potable water and other socio-economic infrastructure. Concentration was on urban water supply until 1994 when the National Community Water and Sanitation Programme was launched to address the growing inequality. This is not to say that rural Ghana did not experience investments in potable water supply at all. Rather, those facilities provided could not stand the test of time mainly due to weak O&M support systems. It is admittedly more desirable for donor partners and governments to commission and implement new projects rather than committing funds to the O&M of built facilities. This is justifiably so because it adds to their stock of achievements in more concrete terms.

It is not uncommon to find Projects, which start and end with the physical construction without sufficient capacity building at various levels to ensure efficient management of O&M. Often, no Provision is made in the Project Package for the establishment and/or strengthening of management institutions at national, Local Government and community levels. Even if such provisions are made, there is often insufficient time to implement them due to the overriding standards/expectations of strict targets achievements from the donors necessitated by the need to complete the disbursements of Project funds within schedule.

The present trend and pace of decentralisation in Ghana and most developing countries is likely to add to the negligence of O&M and to the sustainability problems of rural water supplies unless clear policies are adopted towards increased focus on O&M. Responsibility for implementation is decentralised and these 'new' institutions (Local Government structures) are also expected to establish procedures and infrastructure necessary and to facilitate management and O&M at the community level. These local government institutions, however, will most likely focus their efforts on the implementation side i.e. tendering, contract management etc. rather than on O&M. This is quite understandable since new installations are more appealing in terms of money and political goodwill.

The Paper is thus meant to demonstrate the importance of increased focus on O&M as a necessary condition for reaching full or increased coverage.

Organisational structure of the rural water and sanitation sector in Ghana

Community Water and Sanitation Agency (CWSA): The Community Water and Sanitation Agency (CWSA) is the statutory body established by an Act of Parliament, 1998 Act 564, to facilitate the sustainable delivery of potable water facilities and sanitation services to the rural population.

Regional Programme Offices (RPO): CWSA has Regional Offices in all the ten Administrative Regions of Ghana. In the Volta Region, apart from the other Units, a Monitoring, Operation and Maintenance (MOM) Unit was established two years ago with four full time staff.

The Regional Programme Offices presently have responsibility for supervising implementation in the communities through the respective District Offices and for direct implementation of projects above the value of US$100,000.

District Water and Sanitation Teams (DWSTs): If an implementation Programme covers the District, a District Water and Sanitation Team is normally formed. In the

Volta Region, the Team comprises five Officers, four of whom are seconded from the mainline Departments of the Ministry of Local Government and a District Engineer recruited by the Programme to head the Team. The District Engineers from all 12 Districts meet once every month at the RPO with the Programme Management. At these meetings Progress of work and work plans are reviewed. This ensures a uniform implementation strategy throughout the Region and enables the RPO to follow-up/supervise and quality-control activities in the Districts.

The members of the DWST are supported by the Programme with computers, stationery, vehicles and motorbikes to facilitate their work.

Environmental Health Assistants (EHAs): In the Volta Region the EHAs are the main Fieldworkers. They have also been seconded to the Programme and are given allowances.

Future Situation: *In the future when the implementation role will be shifted towards the District level the above outlined organisational structure will change in different places.*

- The Regional offices will be left with a facilitating role only.
- The role of the District Engineers will be phased out and he/she will not be there as donor supported staff.
- The support to office logistics will be minimised.
- The capacity developed at the Regional level over the past ten years will be missing in the Districts at least in the short term.

Observed Obstacles to Sustainability

The following problems threatening facility sustainability were observed in the course of work by the MOM Unit of the Volta Programme. These problems came to light through the conduct of O&M Audit in more than 50 Programme communities.

Inadequate knowledge on the Maintenance Cost: There has not been adequate knowledge on the future maintenance cost of the facilities. Thus the WATSAN Committees and the communities hardly appreciate the need to make significant savings in readiness for such inevitable challenges. Since the communities were not assisted in drawing detailed budgets, safe revenue levels were not known. This has also accounted for the persistent pressures by traditional leaders and influential people in the community to use water revenues for other projects and activities like festivals etc. Dwindling or stagnating revenue levels has been a common feature in almost all Programme communities.

Unsustainable Tariff System: There was a large number of communities which were implementing a failing tariff system i.e. Monthly Flat Rate (MFR). This monthly water levy was mostly underestimated to between 3 cent and 10 cent per adult or per household per month. Even at these low rates, adults or households were often defaulting heavily to the point where no one was paying anymore. Unfortunately, the communities have had a misconception about the most sustainable tariff system (Pay-As-You-Fetch) as expensive. They did not know that its high revenue generating potential is due to the way it is able to ensure payment for almost all water fetched rather than being expensive.

Financial management: WATSAN Committees were not keeping up-to-date financial records in a well organized way. Some of them were also keeping too much cash at home whilst some Bank Accounts were becoming defunct.

Revenue Collection Efficiency: Even though the Pay-as-you-fetch tariff systems have been in operation, the revenue situation of most WATSAN Committees was bad. Apparently, the vendors were influenced by family relationships, friendships etc. into not ensuring that everybody pays. There were no mechanisms to increase revenue generation such as the use of money boxes, water metres and the introduction of competition among water vendors.

Transparency: The WATSAN Committees were not keeping clear financial records. They were also not rendering Accounts to the whole community resulting in suspicions of embezzlement and misappropriation of money. This condition adversely affected People's Willingness to Pay.

Inaction on Broken-down systems: A number of facilities were broken down and were not receiving any attention due to lack of funds to pay for the repairs and spare parts or due to the dormancy of the WATSAN Committee.

Measures for improved sustainability

The MOM Unit having established a comprehensive O&M Profile for the Programme, then set out to implement a combination of interventions aimed at improving the situation. Notable among them were:

- Participatory O&M Audits of problem schemes (Ref. Paper on O&M Audit – a Practical tool for sustainability by Soley F. and Thogersen J at the 28th WEDC Conference in Kolkata India);
- Performance Monitoring of water facilities and institutions (Ref. to Paper on Monitoring and Evaluation System for Rural Water Supply by Soley F. and Thogersen J for presentation at the 29th WEDC Conference in Abuja Nigeria);
- Facilitate the preparation of District-specific O&M Action Plans on a quarterly basis;
- Direct assistance to District Staff and the communities;
- Capacity Building through Training and on-site coaching;
- Development of O&M Records formats for WATSAN Committees;

- Assessment of the efficiency of Maintenance Tools and recommendations for improvement; and
- Development and distribution of simple O&M IEC materials to the communities through the Districts.

These activities have tremendously improved the O&M situation of the communities. Not only are they now aware of what exactly they have to do to forestall the deterioration of their schemes, but most communities have now adopted the Pay-As-You-Fetch System and are beginning to accumulate more funds in their Bank Accounts. They have also been assisted to know the O&M cost of their schemes. The skills of the District staff have been sharpened through the O&M Training sessions to the extent that they are more able to assist the communities.

Cost of sustainability

For local government institutions to manage the task of facilitating strong community management and O&M of water facilities in rural communities, they need to have an appropriate administration with personnel and funds earmarked for the purpose. They need to build their own capacity and be assisted with the tasks for a prolonged period of time. The strengths and weaknesses of these institutions and the need for assistance will certainly differ from country to country and also within a country.

Based on our experiences from the establishment and operation of the Monitoring and Operation and Maintenance Unit of the Volta Regional Programme Office in Ghana for 2 years, we are able to realistically assess the assistance that is needed by the District Assemblies (the local government institution that in the future will be responsible for the implementation of rural water and sanitation projects). This enables us to estimate the cost of such assistance. The aim of this exercise is not to give an exact price for sustainability but rather to give an indication of the magnitude of the cost. Suggestions of a way whereby other programmes can estimate how much money they need to allocate for O&M in order to achieve sustainability can then be made.

The average population of each of the 12 Districts in the Volta Region is 100,000. The average number of rural communities per District is 300 out of which 100 are presently provided with safe water supply.

When taking the responsibility for implementation and O&M of water and sanitation projects, the Districts need to institutionalise their District Water and Sanitation Teams (DWSTs). and to add a minimum of one person to be responsible for Monitoring and O&M. The cost for the operation of this team is not included in the cost assessments below.

Monitoring and Evaluation system: *The DWSTs need to be supported with the management of an M&E System, the preparation of their quarterly O&M Action Plans, assistance at community level in case of peculiar problems and non-responsive communities and with capacity building both through training and coaching.*

The management of the M&E system will need to be at National or Regional level but the administration of the Monitoring Forms and data entry will be at District level. To avoid a situation where this important activity is neglected some compensation allowances must be given to the Districts for their input. It is estimated that the administration of each monitoring form will cost $7. The District's cost including salaries and mileages add up to $2,800 per year assuming that quarterly monitoring will be done in 100 communities with water facilities per District.

Further, a one day input by a consultant will be needed per quarter for QA purposes costing $400 per year, assuming a day-rate of $100 including transport and subsistence allowances.

Quarterly O&M Action Plans: The O&M Action Plans need to be prepared quarterly based on monitoring results to focus the work of the District team towards areas with potential threats to the sustainability of facilities. Presently one engineer and one socio-economist use 2 days for this planning exercise combined with a training of the District Water and Sanitation Sub-Committee, implying a cost of $1,600 per year.

Assistance at community level: One engineer and one socio-economist using on average 2 days per quarter costing $1,600 per year.

Capacity Building of District Teams: A yearly training for all District Water and Sanitation staff is expected to cost $2,500. On site coaching of the District staff will be an integral part of the activities covered by the other headings.

Cost for O&M Support to Districts: *The total cost for the above activities is estimated at $10,000 per District per year including a 10% contingency for unforeseen activities.*

Cost of neglecting O&M

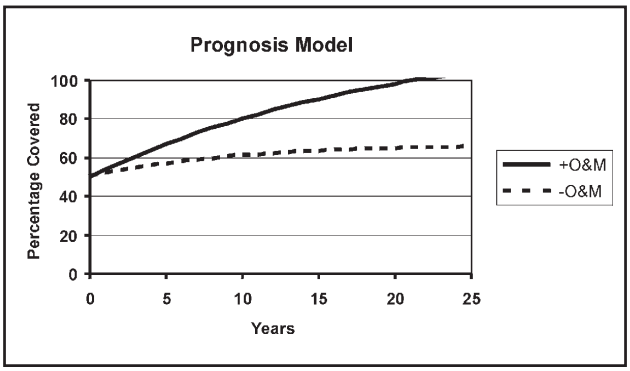
To illustrate the importance of earmarking funds for monitoring and O&M, a simple model has been developed to forecast the coverage level of safe water in the Volta Region of Ghana, if funds are only made available for new installations as apposed to funds being made available for O&M support to the Districts. The following data and assumptions have been used for the model:

- Before the establishment of the MOM Unit at the Regional Programme Office, many facilities were already out of order and many were at risk because hardly any money had been saved in the WATSAN accounts. Thus the average lifespan of the facilities were estimated at around 10 years.
- With the established measures for improved sustainability the estimated lifespan of the water facilities have now been increased to about 20 years
- The total rural population of Volta Region is around 1,200,000

- The rural population of Volta Region presently with access to safe drinking water is around 600,000
- The average cost of providing water to one person is $25
- Volta Region has 12 Districts thus the total cost for O&M support to the Districts is $120,000 per year

The figure below illustrates the forecast of the coverage level of safe drinking water if $2 million is invested yearly in the rural water sector of the Region. The broken line illustrates the scenario where no money is used for O&M support for the districts while the continuous line illustrates the scenario where $120,000 (6%) of the investment money is used for O&M support.

The model indicates that without O&M support the coverage level will stabilize around 67% where after the breakdown rate will equal the rate of new constructions. To reach a higher coverage level, higher capital investment is needed. With O&M support, however, 100% coverage level is achieved after 20 years where after the capital investment can be reduced to only compensate for the breakdown rate.



Conclusion

Implementing Water and Sanitation Programmes without having a clear and focused approach to O&M is highly irresponsible and the poor beneficiary communities become the ultimate victims.

It is hoped that this Paper will contribute to pushing for a fair balance between new implementations and the sustainability of existing facilities from government agencies and donors.

Reference

1. Soley, F & Thogersen, J (2002) O&M Audit, a practical tool for sustainability. Calcutta: 28th WEDC International Conference.
2. Soley, F. & Thogersen, J (2003) Monitoring and Evaluation of rural water facilities. Abuja: 29th WEDC International Conference.

JOHN NEDJOH, Ghana.
JENS THØGERSEN and BENT KJELLERUP, CARL BRO a/s, Denmark