

MONITORING THE FUNCTIONALITY OF RURAL WATER SOURCES USING MOBILE PHONE TECHNOLOGY (M4W)

INTRODUCTION

The recent innovations in Information technology have greatly improved the speed and accuracy in acquisition of data for improving service delivery in various fields including the WASH sector.

In Uganda, the Mobile Phones for improved access to clean water (M4W)¹, an initiative aimed at improving the functionality of rural drinking water sources and improve operations and support mechanisms, has already registered some good results in the pilot districts of Lira, Kabarole, Arua, kasese, Kyenjojo, Amuria, Masind and Katakwi.

The multi stakeholder collaborative initiative being implemented by SNV, IRC/Triple-S, Makerere University, Water Aid and the Ministry of Water and Environment has been running for at least 2 years now with some level of success. Using the M4W system, a water user is able to send a message on a faulty water source and have this water source fixed within a short period of time, depending on the magnitude of the fault assessed.

OBJECTIVES

The prime purpose of initiating the M4W system was to enable people in the rural areas of Uganda to access clean drinking water. This was expected to be achieved through improved efficiency in reporting faults on water sources, quick response to



Above: Water sources clearly identified under the M4W initiative

None-functional water sources and regular acquisition of data for updating the District Water Management Information Systems at reduced

¹ Mobile Phones for Improved Access to Clean Drinking Water, available at <http://m4water.org/>

costs. The M4W initiative has over the last 2 years, achieved most of these objectives.

HOW THE SYSTEM WORKS

The M4W system has been designed as a generic data collection and management system that uses multiple technology platforms (Personal Computers and mobile phones) and provides information to various stakeholders at local, district and national levels. The forms for data collection are defined on the web-based server which runs on the OpenXdata system. The system also consists of a module referred to as the District Water Management Information System (DWMIS) that enables DWOs to manage the operational processes of water point functionality via an internet link. Other stakeholders and the public are able to access information on the M4W website. The data base can also be accessed through a specific link². Information on functionality, location of the water sources and management is also presented using Google maps.

In case there is a problem with a water source, the user sends a text message to the code 8888, indicating the source identification number and the nature of the problem. Once the system receives the notification, it generates an SMS which is automatically sent to the relevant HPM's phone. Upon receiving the message, the HPM goes to the source in question to assess the magnitude of the fault. If the fault is minor, the HPM advises the community on the necessary action. For major faults, the District Water Office is accordingly informed. Each fault attended to by the HPM is reported to the system and the user is also given feedback.

KEY ACHIEVEMENTS

The M4W system provides regular data for updating the District Water Management Information Systems. The District Water Officers are therefore able to tell the state of each of the water sources in the district per Sub County and take appropriate action in case of the faulty ones.

² The M4W system, available at <http://m4water.org/m4w/>

A comparison between the data from the SPR (2012) and the M4W (2013) shows a general upward trend in the functionality figures drawn from all the 8 M4W implementing districts of Lira, Kabarole, Arua, Kasese, Kyenjojo, Masindi, Katakwi, with exception of Amuria district as seen in figure 1.

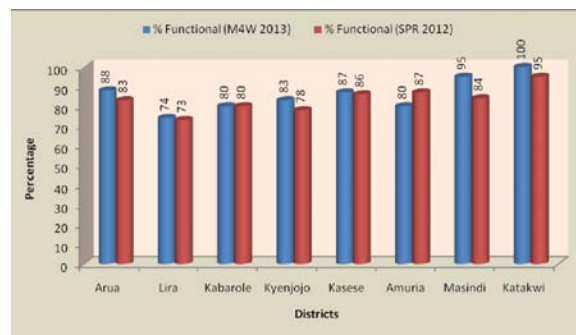


Figure 1. Functionality of Water Sources (M4W 2013 Vz SPR 2012 Data)

In Lira district, part of the data collected using the M4W Initiative on functionality of the water sources in the district is to be used by the District Water Office for requesting the Ministry of Water and Environment to decommission the abandoned water sources in the district. In Kabarole, the District Water Officer is already using the M4W data for planning and annual reporting purposes.

Available data further shows that there is improved response to none functional water sources in the M4W implementing districts. The Hand Pump Mechanics who were recruited and trained to fix none functional water sources are currently involved in repairing faulty water sources based on the messages received from the community, through the M4W system.

Since October 2011 when the system was initiated, at least 1,561 messages on faults have been received, of which 377 water sources have been fixed³. This represents 24% of the water sources being repaired in all the 8 districts on basis of the messages received. For Lira and Kabarole districts alone, out of the 715 messages

³ The M4W database as at 26th September 2013

on faults received since 2011, at least 187 water sources have been repaired meaning at least 26% of the water sources in the 2 districts were attended to on basis of the M4W messages received.

The M4W system has strengthened the existence of Hand Pump Mechanics Associations and their ability to perform Operation and Maintenance support services in the 8 piloting districts where the initiative is being implemented. In April 2013, Lira and Kabrole Hand Pump Mechanics Associations were contracted by Triple-S Uganda to reinstall identifiers onto the water sources and conduct preliminary community sensitization on M4W in the 2 districts. Since then, over 100 new reports on faults have been received from the community.



A Hand Pump Mechanic examines a faulty Shallow Well in Kisomoro Sub County, Kabarole District

The M4W initiative has contributed to increased community involvement in management of their water sources through the Water Source Committees (WSC) which each water source is supposed to have. Available M4W data reveals a positive correlation between the presence of a functional Water Source Committee and improved functionality of the rural water sources in the implementing districts. Data from all the 8 implementing districts presented in figure 2 reveal fewer none functional water sources in districts where the WSCs have already been commissioned (41%) compared to the none functional water

sources in the districts where the WSCs have not yet been commissioned (59%).

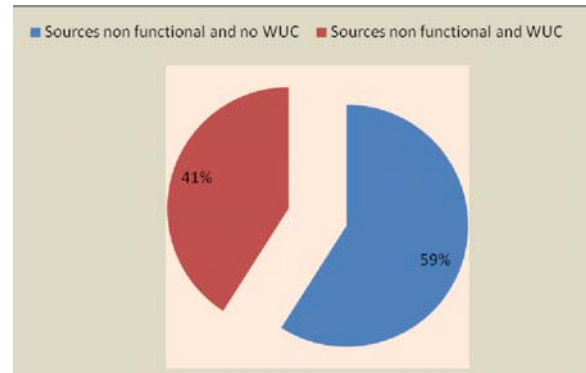


Figure 2: Presence of WSCs Vs None Functional Water Sources

Available figures also indicate that, it would be cheaper to use the M4W system for updating the National Water Atlas/ database as compared to the survey methods used by the Ministry of Water and Environment in the last Water Atlas update, done in 2010. Uganda has approximately 1,400 sub counties and 144,000 water sources. The total cost of providing mobile phones to these sub counties would be 140,000 US Dollars. Considering these phones get damaged / lost, one would have to factor in 20% (28,000) annually to replace them. Additional costs including data collection at approximately 1USD/Source (total 144,000 USD), management of the system (30,000 USD / year). This would translate to approximately 342,000 – excluding training and any other operational costs. Subsequent costs for annual data collection amount to 202,000 USD making annual updates of the water database a viable option.

CHALLENGES AND EMERGING ISSUES

- ❑ The absence of uniform unique water source identifiers at the national level is hampering the process of rolling out the M4W initiative to the communities in all the districts. Massive community sensitization on the M4W system in Lira and Kabarole districts that is currently being done by Triple-S is also being undermined by the absence of standard water source identifiers. The M4W stakeholders have however initiated talks with the Ministry

of Water and Environment to initiate a standard format for all water source identifiers to facilitate the reporting of faults by the community using the M4W system.

- ❑ During the pilot testing phase, it was realized that there is need to provide re-current refresher courses for all the cadres involved in the implementation of the M4W system at the district level including the DWOs, HPMs, HAs, CDOs. In addition, some of the mobile phones have since got lost and had to be replaced. These costs, coupled with the costs of continuous community sensitization on M4W have reduced the pace of implementation of the system among other M4W stakeholders, making it difficult to answer the key research questions for which the system was initiated.
- ❑ The implementation of phase 2 of the M4W initiative, which involves rolling out the system to the community is partly being affected by the 220/= which is charged per sms which the community feels is high. However, the M4W stakeholders have initiated a discussion with the Ministry of Water and Environment to provide a toll free line which will be hosted at the ministry. A concept note to this effect has already been developed and submitted to the ministry. This will also ensure that the community can send the messages on faulty water sources, free of charge which is expected encourage community use of the system.
- ❑ Network and connectivity issues sometimes affect the M4W system. Some sub counties within the implementing districts are for instance located in very remote areas where the MTN network is poor. In this case, the messages may delay thereby affecting the speed of the reporting process.



Figure 1 A protected spring well with M4W identification, Kabarole District

CONCLUSIONS

The M4W initiative is a real potential for monitoring the functionality of rural water sources in Uganda. The system uses the existing government structures at national and district level for collecting and reporting WASH related data. The system currently provides instant data which is useful for updating District Water Management Information systems. Available data also indicates improved functionality and reduced costs of acquiring WASH data in the 8 implementing districts. While greater impact is anticipated after the system has been mainstreamed by MWE, the current achievements so far registered are enhancing the functionality of rural water sources in pilot districts.