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**DELIVERING WATER, SANITATION AND HYGIENE SERVICES
IN AN UNCERTAIN ENVIRONMENT**

**Using mobile telephones technology to address
functionality of rural water supply systems in Uganda**

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BRIEFING PAPER 1761

Uganda's Ministry of Water and Environment last updated the information on coverage and functionality of the point water sources which lead to the establishment and publication of the 2010 Water Atlas. While the Ministry sees potential benefits from improved information about the state of rural water sources, it also realises that the real benefit for the water user is only achieved when information of a broken water point leads to prompt repair of the source. The challenge with the monitoring system is to improve not only information collection, but its flow that leads to action to improve water services on the basis of information collected. Real time information on functionality of water services is vital if functionality is to be increased and the use of modern technology is critical if this endeavour is to be achieved.

Introduction

In 2009, the Ministry of Water and Environment in collaboration with partners (Local Governments, Civil Society Organisations and Development Partners) updated the information on coverage and functionality of the point water sources in Uganda. The Water Atlas Update Project (WATSUP) ended with the establishment of a Water Supply Database and publication of the 2010 Water Atlas. While the sector sees potential benefits from the improved information about the status of the rural water sources, for example in better planning for rehabilitation and investment of sources, it also realises that the real benefit for the water user is only achieved when the information of a broken water point leads to prompt repair of the source. The first challenge identified with the monitoring system is to improve not only the information, but the information *flow* that leads to action to improve the water services on the basis of information collected. In addition, it is acknowledged that the data of the recent Water Atlas 2010 was collected in 2009, which means that between collection and publication, a time span of 1 to 2 years had elapsed. The second challenge for the water sector is how to keep the data and information on the more than 100,000 rural drinking water sources up to date.

Against this background and the increased use of mobile telecommunication especially in the rural areas of Uganda, that the Mobile Telephones for Improved Access to Safe Water (M4W) Project was launched in October 2011 with seed funding from African Technology and Transparency Initiative (ATTI) of Hivos to SNV. The overall project aim is to improve the functionality of rural water points through actionable and timely information. This leads to reduction in downtime and enhancement of the Operations and Maintenance (O&M) support system by enabling water users to send a Short Message (SMS) to report a fault at a water source. The report triggers action by the Hand Pump Mechanic (HPMs) or Scheme Attendant (SAs) and the follow-up can be monitored by the district water office, using the internet. Specifically, the pilot aims at:

1. Improving efficiency in reporting faults;
2. Triggering action for response to non-functional sources; and
3. Improving efficiency in updating District and National Information Systems.

This paper explains how M4W works, the role of local government particularly in the initiative, the challenges so far encountered during the pilot and some of the actions that are planned for the coming months.

Clients and partners

The M4W pilot started in September 2011 with wide consultations with key stakeholders in the rural water sector at both national and district level. SNV specifically met with the Ministry of Water and Environment (MWE) to introduce the innovation to the Ministry and get buy-in and to ensure that M4W is fully aligned with MWE’s existing policy and strategy for sustainability. SNV contracted Makerere University for IT to design the software and other local providers to supply the water source labels. The software was aligned with the MWE’s 2010 water supply update project-WATSUP database to avoid duplication of efforts and to align with existing government data verification support procedures. Linking to WATSUP provided a good starting point and enhanced ownership of M4W by both local and central government.

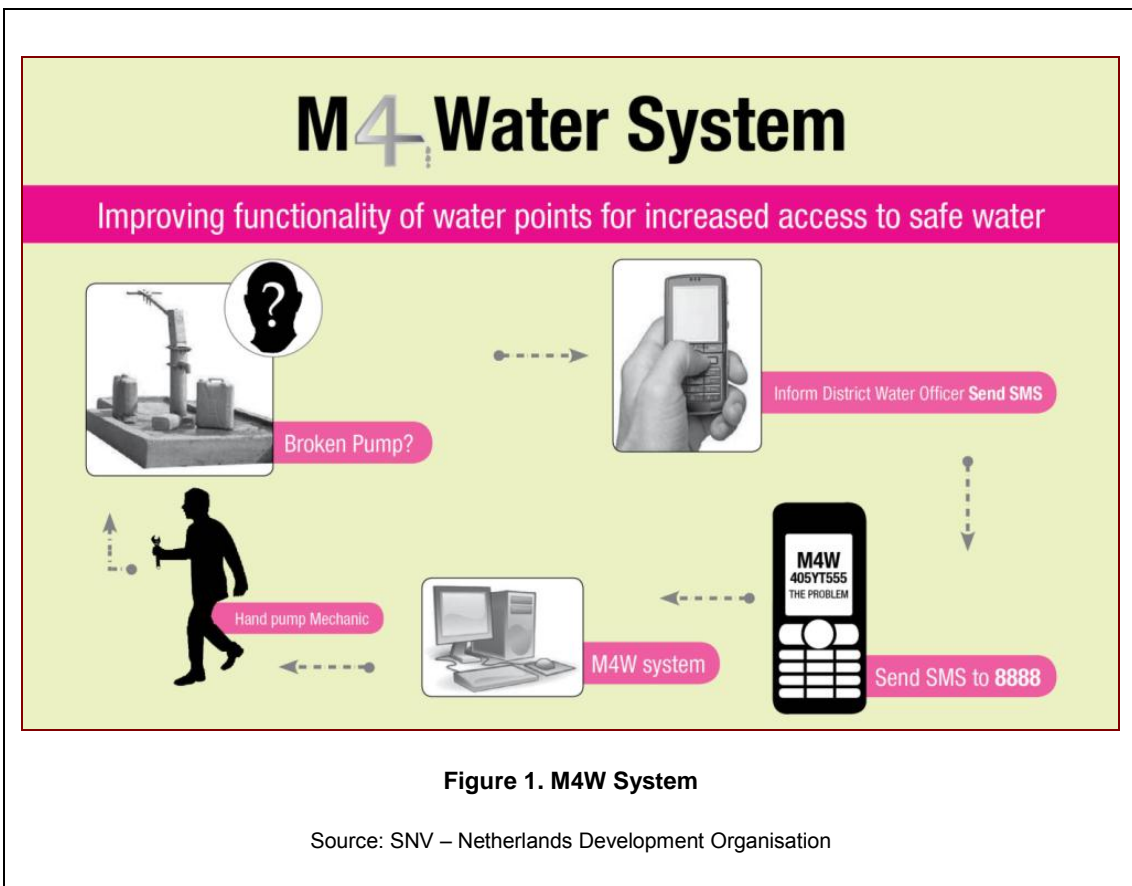
As a result of SNV’s approach of encouraging wider stakeholder involvement and engagement in WASH not only MWE, but IRC/Triple-S and WaterAid Uganda also became partners in M4W since it supports and aligns with their own work in WASH. The project draws on the skills and expertise of all five partners to guide and test the system for a greater number of districts.

Outreach

Seven district local governments were selected for the testing phase with SNV directly supporting the testing in Arua, Kyenjojo and Kasese districts, IRC/Triple-S supporting Lira and Kabarole districts and WaterAid Uganda supporting Amuria and Masindi districts. Altogether, there are over 8,000 water sources serving over 1,000,000 people in the 7 districts. The types of water source include Shallow wells, Deep boreholes, protected springs yard taps and public tap stands.

Intervention logic and method

The concept of mobile phone reporting is to reduce water point “downtime”, i.e. the time a water source remains broken before being repaired.



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Water users send a Short Message (SMS) to report a fault at a water source initiating a 'fault report'. The report is received by the assigned Hand Pump Mechanic (HPM) or Scheme Attendant (SA), who is required to attend and assess the fault within 48 hours. Having attended the water point, the HPM or SA sends an assessment report to the district, Failure to send a report with 48 hours results in a reminder being sent to both the HPM and the district enabling monitoring by the district water office, using the internet. The initial report is also sent to a central database managed by the District Water Officer (DWO), to update their database of water point functionality status. Therefore M4W supports three issues:

1. Improving efficiency in reporting faults;
2. Triggering action for response to non-functional sources; and
3. Live updating of District and National Information Systems.

M4W intervention and support

Each partner organisation provides Java-enabled telephone handsets to the Hand Pump Mechanics (HPMs) and Community Development Officers/Health Assistants (CDO/HAs) of their respective districts to allow entering, uploading and approval of more elaborate information for the baseline and assessment reports. Makerere University installed the bespoke software on the phones. The project provided district level training targeting existing hand pump mechanics, water office staff and sub-county extension staff. Training highlighted the roles of each actor as well as practical use of the phones to check, collect and send water point data.

After the training, testing of the software and systems began. Staff started to collect information from the field and send it to the database. The District Water Offices, the supporting partner and Makerere University provided backup to the field staff including phone trouble shooting.

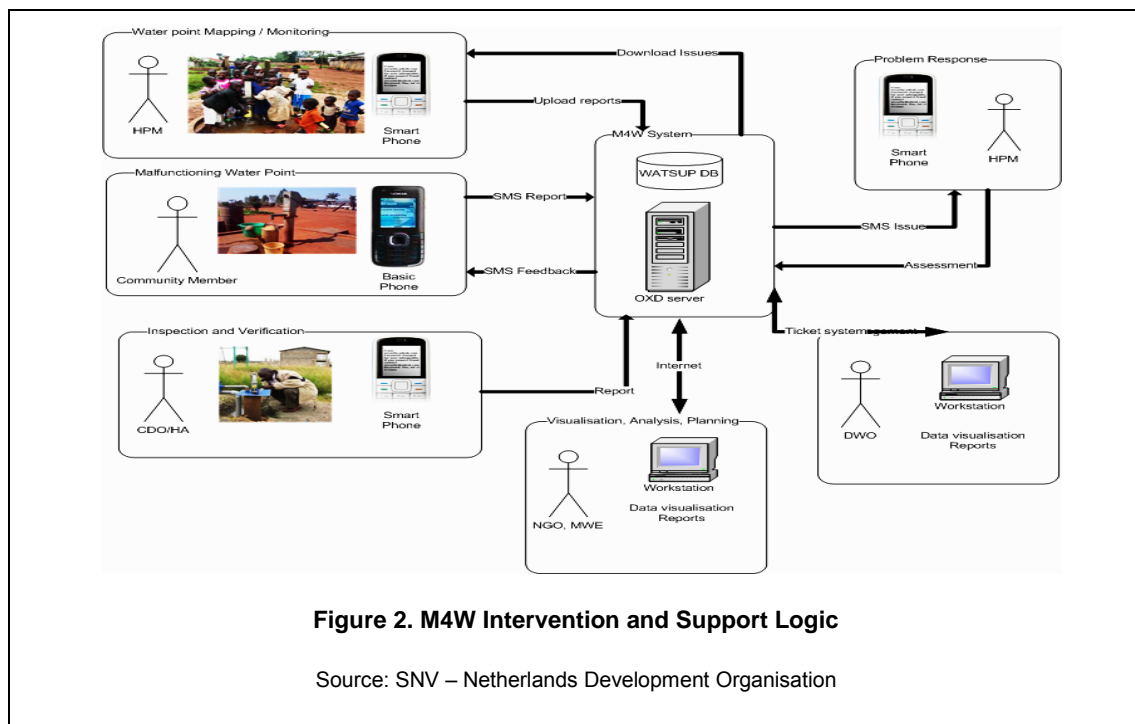


Figure 2. M4W Intervention and Support Logic

Source: SNV – Netherlands Development Organisation

During the field information collection exercise the hand pump mechanic also placed the sticker with an identification number on each water point. This ID is a unique number given to each water point. Several methods were considered including engraving but the testing phase settled for use of stickers as it was the cheapest option. It was however realised that these stickers do not stay long and hence the need for the water users to record this number in their own record.

The information is collected in offline mode on the phones, which enables data collection to continue even when networks are down. Problems with a water source can be reported by anyone by sending a SMS with any type of mobile phone. Charges for an SMS are usually less than USh 2/= (less than 1 US\$ cent).

The system has inbuilt worker assignment, monitoring and verification procedures at sub-county, district and ministry levels. It also allows the District water offices and the MWE to generate up-to-date reports and the rural water stakeholders to access current information online.

A hand pump mechanic’s comment on the M4W benefits

“This is very easy and simplifies my work”

Mr. Ogongo Godfrey, a hand pump mechanic in Agali Sub-county in Lira remarked that after successfully sending data and receiving notification from communities for problems they were having with their water points.

M4W results so far

The development and testing phase has been well received by all actors including the hand pump mechanics.

Database collection is on-going in 6 districts, with one district having been completed. Initial data indicate that up to 19% of water sources are missing from WATSUP. This fact in itself underlines the need for field validation of water supply infrastructure.

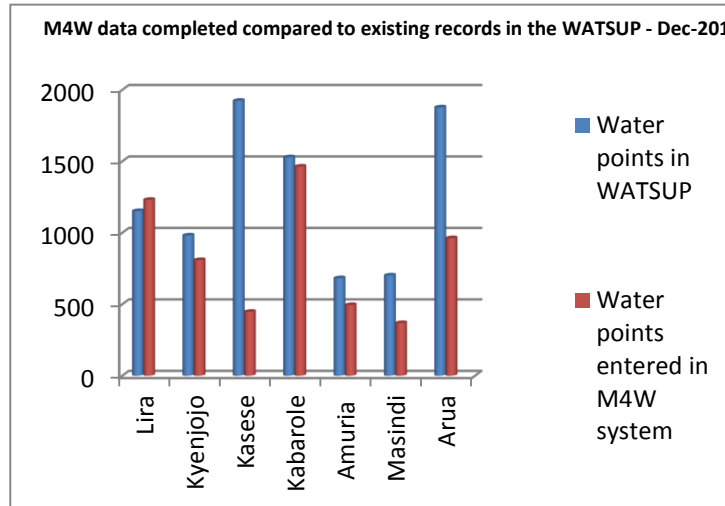


Figure 2. M4W data completed compared to existing records in the WATSUP December 2012

Source: SNV – Netherlands Development Organisation

Although the testing phase is on-going, community members have already started reporting water point problems by SMS.

An M4W website has been set up and linked to Google maps and can show actual location of point water sources. www.m4water.org/index.php

The system has been well received especially by the hand pump mechanics. “This is very easy and simplifies my work,” Mr. Ogongo Godfrey, a hand pump mechanic in Agali Sub-county in Lira remarked after successfully sending data and receiving notification from communities for problems they were having with their water points. Another hand pump mechanic explained that previously, they never actually visited all the water points because they relied on local knowledge. The new baseline data collection process of labeling water points requires them to make actual visits. The DWOs too were impressed that the information provided to them would enable them to plan and serve the communities better. A few HPs showed incompetence in using the phones – especially in Kasese. Even after the orientation workshops, more on-spot training sessions have been extended to these mechanics to improve their abilities in using the telephone handset.

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HPMs have been collecting baseline data. The use of the system to collect baseline data has enabled instant access to the latest baseline information. In addition, community members have already started reporting problems using SMS. It is useful to note that the information collected through M4W system can directly be fed into the WATSUP (Water Atlas Update Project) database, which will continuously be updated by the system. This means that with the M4W innovation, the WATSUP database will have real-time information on the status of the water sources.

Identification of mismatch between WATSUP data and M4W data

In the sub-counties where data have been collected so far, it is found that 19% of the sources identified by M4W were not entered in the WATSUP. This figure is after the newly constructed ones (sources constructed after 2009) were filtered out. Some of differences can be fed back to changes in boundaries of sub-counties, or mistakes made during the entering and/or processing of the data. But more importantly it is already showing the value of M4W in improving the WATSUP information. At the same time it also points to the need of proper verification procedures. The verification should be carried out under the responsibility of the DWO who can delegate to the sub-county level. The data that has been uploaded by the HPM should not be approved before they all have been validated by the CDO or HAs supervising a certain HPM. Also clear guidelines for verification need to be provided to the district water office, like sample size, and methods as physical visit and verification by phone.

Establishment of the MIS Working Group

The MIS (Monitoring Information System) working group is an informal working group led by the liaison office of MWE. The working group has been created to coordinate the different initiatives that are on-going to improve monitoring in the Uganda WASH sector. It therefore brings together stakeholders of government, civil society and organisations with a special interest in the subject, like the Makerere University and the Uganda Bureau of Statistics. To date the working group has organised two meetings, which were used to update the sector on progress and issues related to M4W and to recommend on the way forward of the initiative.

Linking WATSUP-M4W with Google Maps

The setting up of the M4W website is another major milestone reached in the implementation of this initiative. It provides google maps showing actual location of point water sources.

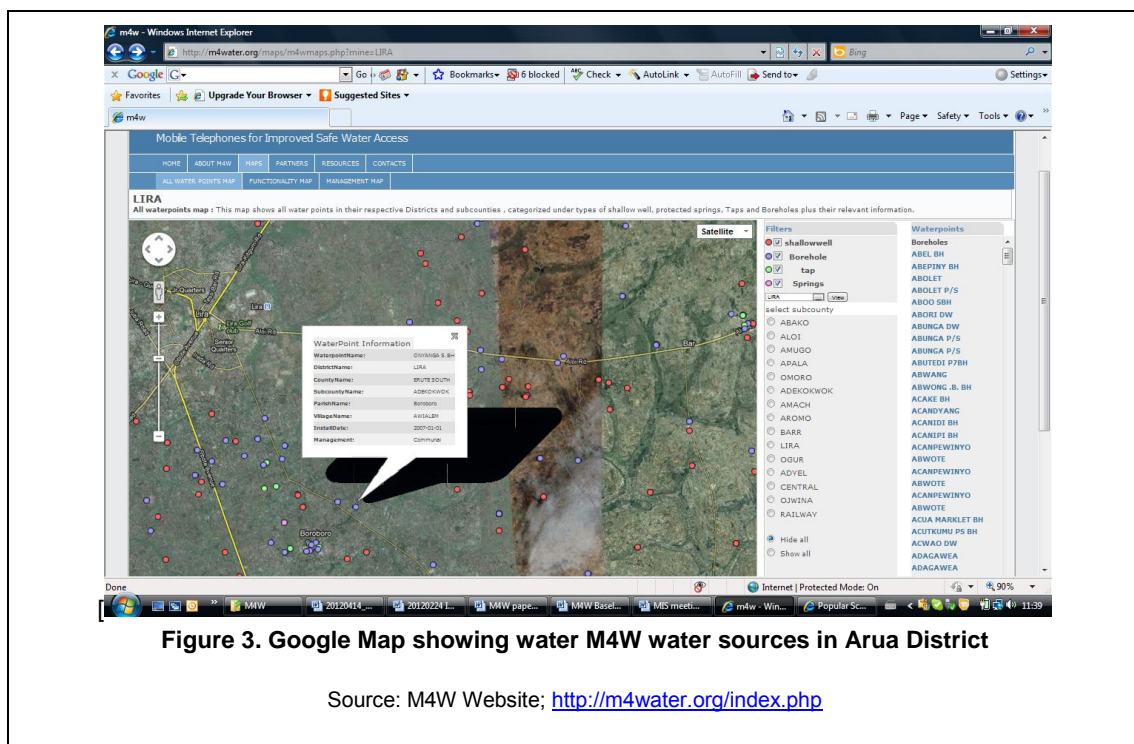


Figure 3. Google Map showing M4W water sources in Arua District

Source: M4W Website; <http://m4water.org/index.php>

Lessons learnt from testing phase

Not surprisingly the testing phase has identified a number of problems to be addressed

- stickers on the water points that don't last
- server is down or phones cannot connect
- phones lose configuration because HPMs swap SIM cards
- communication problems between the project implementers and water point users
- Preference for users to make voice calls than SMS

The benefit of a staged testing phase means that the system can be continuously improved and updated to respond to these problems.

M4W on its own plays a small role in improving functionality. In the case of Uganda, it has been useful to link it to SNV's complementary activities, such as support for the establishment of vibrant business oriented hand pump mechanics associations at district level and a functional spare parts supply chain.

Overall investment

Since the start of implementation to date, US\$ 75,000 has been invested to cater for both the soft and hardware processes.

Conclusion

The experience of using modern technology to address challenges in functionality of water services in Uganda has gradually matured. This initiative has demonstrated the usefulness of technology in improving communication and enabling communities to access services of stakeholders assigned with the task of ensuring functionality of water services in Uganda. It has also shown that technology can be used to undertake additional tasks beyond which they were originally assigned. As SNV continues to work with its partners, lessons are being documented on rolling out this initiative to other sub-sectors such as sanitation. In the years to come, we shall see M4S – Mobile phones for sanitation.

References

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