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DIGITAL TECHNOLOGY AND WASH

USAID seeks to use digital technology to help people around the world lead more resilient and prosperous lives. In the area of water, sanitation, and hygiene (WASH), applications of digital tools can improve asset management and service delivery, monitor and predict water resource availability, strengthen payment systems, and influence individual behaviors. Digital solutions for WASH are at varying stages of development and demonstration of results and sustainability. As the field continues to evolve, it is critical to understand and plan around the challenges of using digital solutions and the risks of exacerbating inequalities presented by digital divides – gaps in digital technology access, literacy, and adoption that exist between groups (e.g., urban and rural, male and female).

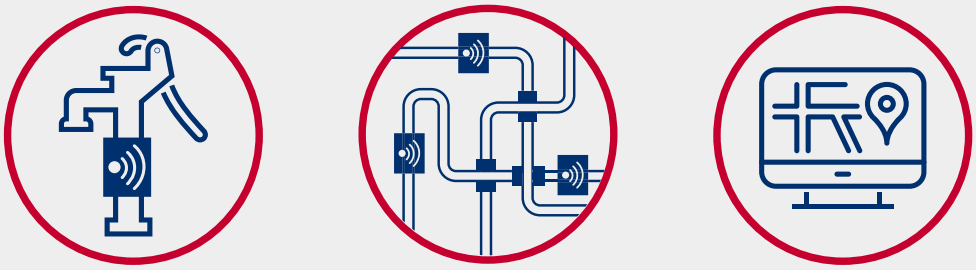
COMMON PURPOSES OF WASH DIGITAL TECHNOLOGY

Digital technology can serve myriad purposes in monitoring and strengthening WASH systems and practices. Below are frequent types of use in four overarching categories.

ASSET MANAGEMENT AND SERVICE DELIVERY

Digital technology can transform how water and wastewater utilities and other service providers manage networks of infrastructure and equipment. Maps of water points and infrastructure form a basis of asset management systems; these may use open-source platforms such as Water[1] or other enterprise software for utility management. Data can be automated in systems via networked meters and sensors; mobile data collection tools are frequently used to gather asset data from water point sources that are not networked. Regular updating and monitoring of asset data creates a feedback loop to service providers for planning, management and decision-making. Predicting future demand and pinpointing when shortages might occur can contribute to improved planning. Data can also inform management, such as scheduling servicing for emptying latrines or water point maintenance. More advanced systems are testing the use of artificial intelligence (AI) to predict needs and schedule preventive maintenance, minimizing disruptions in service.[2]

A NETWORK OF SENSORS CAN SUPPORT WATER SERVICE DELIVERY



Sensors and mobile data collection tools collect and update data from the field

Data is distributed to those who need it

Decision support tools enable decision makers to use data to improve services

[1] https://www.mwater.co/
[2] For example, http://www.oxwater.uk/oxford-smart-handpump.html

A sensor is installed at a borehole well site
Source: USAID/Ethiopia Lowland Water, Sanitation and Hygiene Activity

WATER RESOURCES

Digital technology can help accurately manage freshwater supply – enabling water providers, governments, and humanitarian actors to prepare for shortages or storm surges and manage competing demands. Groundwater can be measured through sensors placed underground (e.g., in boreholes), or through satellite-generated data. Satellites and weather stations – sensors that collect a variety of measures – are used to collect precipitation data. Imagery from other satellites is often used to measure surface water levels, as well as inform some indicators of ambient water quality, such as types of aquatic vegetation that can increase disease.[3]

IMPROVING WASH SERVICE PROVIDER BUSINESSES

Mobile payment solutions have efficiency benefits for water and sanitation services, such as through pre-payment for water via Water ATMs. Metering systems that enable payment per volume of water can help providers improve water use efficiency. Sanitation businesses, such as fecal sludge emptying services, have also used mobile technology to connect to households in need of services and optimize service delivery.

COMMUNICATIONS FOR BEHAVIOR CHANGE

Digital technology can also be used to influence human behavior, such as handwashing and use of latrines. Initiatives seek to influence these behaviors by sharing short pieces of advice or information, or by using 'edutainment' formats like dramas. Radio and television continue to be used for such purposes. With widespread uptake of mobile phones around the world, behavior change programs are increasingly using SMS messaging or outbound dialing, and Interactive Voice Response (IVR), which enables users to call in and select content to hear.

CHALLENGES IN USING DIGITAL TECHNOLOGY FOR WASH

Amid the many purposes digital tools can serve to further WASH outcomes, a number of challenges can stand in the way of success, such as:

- Limited capacities for using digital tools among water and sanitation providers;
- Tool outputs often require substantial analysis before they can inform concrete decisions;
- Issues in systems integration and interoperability (e.g., between utilities and equipment providers);
- Sustaining system maintenance and use after donor exit; and
- Inability to act upon data provided through digital tools due to other bottlenecks.

DIGITAL DIVIDE CONSIDERATIONS

The adoption of digital tools can exacerbate inequalities between those with and without digital access and literacy. Rural service providers are far less likely to have access to digital tools or literacy to best use data for decision making. As mobile money becomes required for payment, people without mobile phones, cellular network access, or literacy skills may find it harder to access critical resources like safe water and sanitation. Women are less likely to have access to technology like mobile phones, yet are often responsible for procuring water. Less digital experience may make it harder for women to be employed by service providers as digital adoption grows.

[3] For example, under USAID's Water for Africa through Leadership and Institutional Support (WALIS) project in Senegal.