TREND OBSERVATORY ON WATER

TREND SHEET

"Digital technologies help reducing inequalities in water security"

#1

Digital technologies offer great opportunities to reduce inequalities in water security, including access to water resources, to water supply and sanitation services as well as protection from water-related disasters. This trend sheet presents promising approaches to reduce inequalities and help reaching vulnerable and disadvantaged groups. It aims to encourage reflection on replicability of these examples, but also on the challenges linked to applying digital solutions in water (resources) management and governance.

Significant inequalities remain in access to water and related services

UN Sustainable Development Goal 6 (SDG 6) aims to "ensure availability and sustainable management of water and sanitation for all." Over the past decades, significant progress has been achieved globally in providing access to water, sanitation and hygiene (WASH) services. But the world is still not on track: Billions of people are left behind in access to WASH services and resources are still not managed sustainably.

Significant inequalities exist across and within countries. For example, about 60% of the urban population worldwide use basic drinking water services, whereas this applies to only 20% in rural areas. This gap is expected to increase due to migration and urbanisation trends. Inequalities also exist between different groups of population, **ever so often the poor, women, or ethnic and other minorities are left behind**. This refers not only to access to WASH services but also to water for e.g. agricultural production, where rural small-scale farmers often do not get fair shares. Moreover, the poor face higher risks to be affected by water-related disasters such as floods and droughts.

The digital revolution offers opportunities to reduce inequalities

The world is currently experiencing breakthroughs in a number of digital technologies. More people than ever have access to mobile phones, the internet, and other digital services. Digital solutions also offer a number of opportunities to resolve current water challenges – both in developed and in developing countries. Real-time Information and Communication Technology (ICT) solutions can help monitor and manage water more efficiently thus increasing availability for all. Digitalization will also influence how public institutions and individuals interact and communicate and can thus support good governance in the water sector.

However, digitalisation will also require new skill sets in technological development and application. While mobile phones are widely used all over the world, it is expected that by 2020, less than 25% of the population in least developed countries will be using the internet since most will lack the necessary skills.

Digital solutions bear the potential to ensure more equity in water (resources) management

INCREASING TRANSPARENCY

Transparency improves allocation of resources, thereby availability of water and services for all

Corruption generates "water poverty" by reducing the quality and availability of services, which disproportionately affects the poor and marginalised. Solutions such as visualization and tracing of water distribution can help tracking performance and holding decision-makers accountable. Whistleblowing and anti-corruption platforms can help detecting corruption and illegal acts. Also, blockchain approaches can support fair distribution of water rights. These solutions help reducing transaction costs and providing a reliable context to encourage investments and water management reforms – thereby reducing inequalities related to water availability, accessibility and allocation.

FACILITATING PARTICIPATION AND ACCESS TO INFORMATION

Digital solutions for public involvement and access to information help marginalised groups to have a say in decision-making

Digital devices can offer low-cost and efficient means for raising awareness, educating people, and providing access to information. They can also facilitate public participation in water planning and decision-making, allowing NGOs, civil society organisations and marginalized groups to have a voice in finding suitable solutions to their needs. Providing these groups with access to relevant information empowers them to take action and advocate for their interests. Digital approaches facilitates reaching out to groups who are difficult to contact, e.g. those living in remote areas or women and elderly staying at home.

Case studies

Whistleblowing to help fighting corruption in the water sector

The "Phones against Corruption" project in Papua New Guinea is designed around an SMS service which is simple to use and works on any phone. A user sends a message to the free phone number and reports on corruption by responding to several short questions. Since its implementation in 2014, more than 250 cases of alleged corruption are being investigated, including the arrest of two government officials for mismanaging funds totalling more than US$2 million. Such platforms can also help detect corruption in the water sector and thus save money that could have been spent for providing WASH to the poor.
http://www.asia-pacific.undp.org

Open access to water data empowers citizens and marginalised groups

Akvo developed an open data portal in 2010 for the creation of national water atlases of five West African governments. Akvo mapped water points across these countries and displays them in interactive maps and data analysis features, allowing governments to make informed decisions at local and national levels. This information also empowers citizens by providing them with the evidence they need to lobby for improved water resources. Understanding the information provided in an open data portal however requires a certain level of analytical capacity, which might limit their use to certain groups of the population only. Also, data collected can be manipulated and citizens do not necessarily have the capacity to detect this.
https://akvo.org

Crowd-sourced data for improved disaster response

The web-based platform "Peta Bencana" started in 2013 to make use of crowd-sourced reports from social media to produce real-time flood maps in Jakarta. When someone tweets the word "banjir" (flood) and tags @PetaJkt, the platform automatically replies using artificial intelligence (AI), and asks users to confirm their location, input the flood height, submit a photo, and briefly describe the situation. It then combines all incoming citizen reports with official data from the city government to build an up-to-the-minute, online flood map. The platform has been used by millions of citizens and has been adopted by the National Emergency Management Agency. It was extended to other cities in Indonesia and it is planned to be replicated in Australia, India, and Vietnam. Platforms such as Peta Bencana can empower people to act on flooding and other disaster issues in areas which are otherwise difficult to monitor. However, it is designed to work in areas with many social media users, thereby so far limiting its use to highly urbanised environments.
https://info.petabencana.id

IMPROVING MONITORING OF WATER RESOURCES AND SERVICES

Monitoring water resources, distribution networks and access to services help increase efficiency and identify inequalities

Digital technologies provide comparatively cheap and easy solutions for improved monitoring in the water sector, especially in areas that are difficult to access such as remote rural areas or densely populated informal settlements. Digital monitoring approaches range from citizen data collection for monitoring of water quality and usage to high-tech solutions such as remote sensing and drones to monitor water resources, and robotics to inspect pipe systems. These solutions can help manage water more efficiently and thereby increase availability and quality of water resources and services, especially in less attended areas.

PROMOTING PRO-POOR WATER FINANCING AND TARIFFS

Digital solutions provide opportunities for innovative water payment concepts and crowdfunding.

Successful collection of water payments is essential to provide long term sustainable clean drinking water for all people. Designing equitable water tariff structures that benefit – rather than penalize - people in poor and disadvantaged situations remains a major challenge. Digital solutions can help finding ways to ensure that water is affordable for all by introducing financial crowdsourcing and innovative water payment concepts in the water sector.

Using mobile technology to strengthen monitoring in the sanitation sector

The Oneworld Foundation in India piloted a smartphone application in 2012 to let villagers collect data on their sanitation behaviour directly from their rural households. It can incorporate features such as geo-tagging and photographs to make results more credible and relevant, and present data as user-friendly maps to enable quick grasp of the status. The process can be replicated at large scale and at periodic intervals to address the gaps in monitoring of usage of sanitation facilities in rural areas. Provided that the targeted rural areas are connected to the internet, especially the rural poor can benefit from such monitoring systems. Collecting this type of data may however raise privacy concerns if it is not properly encrypted.

www.zaragoza.es/contenidos/medioambiente/onu/962-eng.pdf

Blockchain technology for trustworthy and transparent water-quality-control

Water pollution is a major issue in Russia, with more than 10 million Russians lacking access to safe drinking water. The 2018 pilot project "Drone on the Volga" combine modern robotics, blockchain and Internet of Things (IoT) to demonstrate how water pollution can be monitored without human interaction. The approach was tested it in the largest water reservoir in Eurasia, located in the Volga river. An autonomous drone able to navigate the reservoir measures and processes water quality data which is then fed into a blockchain. It can be the basis for continuous trustworthy and transparent monitoring for water-quality-control. It relies however on high-end technology which require technical skills not always available in developing regions.

http://bit.ly/drone-on-the-wolga

Innovative water payment concepts reduce payments for water services

Safe Water Network (SWN) started a pilot project in 2018 with local communities in Ghana to build and operate water stations, aiming at transferring the stations to the communities once they are financially self-sufficient. SWN installed 100 smart meters at 100 households and showed customers how to use their mobile phones to store, send, and receive money. As a result, households consumed 27% less water, and stations took in 18% more revenue. SWN more than doubled its per-litre payment collection, and operator time spent on collecting payments fell from 12 to 5 hours per month. This pilot shows that water service providers can install automated systems that are secure, safe and financially self-sufficient also in rural areas. An important requirement to ensure sustainable benefits of such systems is that all households of a community have access to the smart meter technology – otherwise there is a risk of increasing inequalities.

https://www.safewaternetwork.org

Definitions

"Digitalization refers to the practice of taking processes, content or objects that used to be primarily physical or analog and transforming them to be primarily digital."

Information and Communication Technology (ICT) are technologies that are used for accessing, gathering, or communicating information.

Internet of things (IoT) is the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data.

Robotics/Automation is the technology by which a process is performed with minimal human assistance.

Artificial Intelligence (AI) describes intelligent systems that learn, adapt and potentially operate independently rather than just perform pre-defined instructions.

Blockchain is a decentralized, distributed and public digital register that is used to record transactions across many computers so that any involved record cannot be altered retroactively, without the alteration of all subsequent blocks.

The "**Trend Observatory on Water**" of the Swiss Agency for Development and Cooperation (SDC) analyses how major global trends can affect water resources and management practices in the future. In various trend sheets, the Trend Observatory run by adelphi will inform water practitioners about how global trends will influence their work in the future. It aims to raise awareness of opportunities that arise for more sustainable solutions, but also the risks and challenges that might come along with them.

The "Trend Observatory on Water" is an initiative of SDC's Global Programme Water (GPW). GPW aims to develop solutions to emerging global water challenges through political dialogue, fostering innovations and knowledge-exchange. GPW hosts the thematic network RésEAU, which brings together a large network of water experts, including staff of the different SDC divisions, their implementing partners as well as government counterparts. The core objective of the Trend Observatory is to keep the community informed about emerging trends and innovative approaches, and to integrate them effectively into events and activities of the RésEAU network.

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SDC Network RésEAU

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