RésEAU webinar: How can digital technologies help reduce inequalities in water security?

Photo credit: Tom Perry / World Bank

This webinar was held on 20 January 2020 as part of the RésEAU webinar series. It highlighted the first output of the Trend Observatory, an initiative led by SDC's Global Programme Water to anticipate new themes and emerging possibilities for development cooperation in the water sector.

The objective of this webinar was to give an overview of interesting and innovative digital approaches in the water sector, and discuss their potential to reduce inequalities in water security. It was also an opportunity to initiate a discussion on the challenges related to applying digital technologies in development and cooperation with a focus on water.
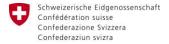
Key takeaways

- Digital solutions have the potential to provide more equity in water services and water resources management, provided that access to technology and the skills needed to use the technology are available to all concerned;
- New technologies are strongly influencing the water sector, opening many interesting prospects. However, competent experts are needed to design, establish, and maintain the overarching framework for sustainable water services and water resources management;
- Digital technologies should never be the only available option; otherwise, the poorest and most marginalised groups may be unable to access services, leading to an increase in inequalities.

First speaker: Prof. Dragan Savic, CEO of the KWR Water Research Institute and Professor at the University of Exeter (UK)

The quantity of information available nowadays is unprecedented in human history: 90% of the digital data in the world today has been created in the last two years alone! So what is digital water and what are its basic building blocks? These include Information and Communication Technologies (ICTs), sensors, analytics (increasingly using Artificial Intelligence and modelling to help us make decisions for water management), software, control technologies and robotics. For instance, some utilities now have robots do pipe inspections, based on data and sophisticated modelling to help detect potential faults. These digital tools can be used by water service providers to form a cyber-physical system for smart and sustainable drinking water infrastructure management.

'Water Kiosks' or 'Water ATMs' are another example of digital water in low- and middle- income countries. For instance, water ATMs can be solar-powered, cloud-connected, and accessible 24/7. In India, water from some ATMs can be fifty times cheaper than bottled water. Customers can use rechargeable cards or mobile phones to pay.

The future looks bright for digital water: there will be more data (big data), more integration of data from various sources and better models, and more use of Artifical Intelligence, with computers helping humans to make informed decision-making. There are, however, concerns that need to be addresses: issues around security (cyber-attacks), privacy, legal and ethical concerns (who owns the data?). Finally, key challenges for the development sector in particular include whether the intended users are able to access technology and have the right skills to use it. Like any technology, digital technology is open for abuses and misuses, so we need to balance the risks and potential benefits.

➢ For more information, see the [IWA Digital Water White Paper 2019](#).

Second speaker: Annika Kramer, Senior Project Manager, adelphi and lead consultant for SDC's Trend Observatory
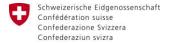
Significant inequalities in water security remain, with only 20% of the rural population worldwide having access to basic drinking water services (compared to 60% of the urban population). The poor are also much more likely to be affected by water-related disasters, and women, ethnic and other minorities to not getting their fair shares of water allocation.
Digital solutions bear the potential to ensure more equity in water (resources) management. Four main pathways through which digital technologies help reduce inequalities in water security were identified in SDC's [Trend Observatory](#)'s first [Trend Sheet](#) and presented during the webinar:

- **Digital technologies can facilitate monitoring**. Approaches range from citizen data collection to high-tech solutions such as remote sensing. Those technologies are particularly helpful to allow more efficient water management in areas that are difficult to access, such as remote areas and densely populated informal settlements. For example, see a smart-phone app developed to monitor rural sanitation in India.
- **Digital technologies can facilitate communication and participation**. Digital devices offer low-cost and efficient means for raising awareness, educating and informing people. This facilitates public participation in water planning and decision-making, as well as reaching out to and involving groups who are difficult to contact, for example in remote areas. Providing access to relevant information can empower marginalised groups to advocate for their interests, and new communication solutions supports them in raising their voices. For example, see an [Open data portal on water points in West Africa](#) developed by Akvo.
- **Digital technologies can provide opportunities for innovative funding and payment concepts.** Digital funding concepts include crowdsourcing, collection of water fees can be facilitated by card or mobile payment. . This can increase revenue and funding for water services in rural and poor urban areas. In Ghana, for example, [community-operated water stations](#) and [smart prepaid meters](#) for household connections helped increase revenues for the service providers, and time spent on revenues collection decreased.
- **Digital technologies can increase transparency** by tracing and visualising water allocation and service performance. This information helps holding decision-makers accountable and detecting corruption. For example, [Phones against corruption](#) in Papua New Guinea is a simple SMS service where users can report corruption. This example is not specific to water but could be used in the water sector as well.

Reflections from discussant: Jacques Louvat, Regional Technical Advisor West Africa, Helvetas Swiss Intercooperation

Digital water is here, but the question is how to better use technologies so that everyone and especially vulnerable minorities can access better water services. Mobile phones for instance are found in the most remote parts of the world, and are used by many illiterate users. Therefore, saying that people are too poor to pay for water, or blaming illiteracy for the lack of repairs of hand pumps, is not justifiable.

While using smartphones to collect data for surveys is much more efficient than the paper and pencil method, it is not the smartphone that formulates the question or analyses the data collected. The speed of information transfer is a fundamental asset, allowing for high-level reactivity and efficiency: for example, in Benin, thanks to a smartphone application, users can identify and contact the nearest emptying truck to empty their latrines. Beyond information, transferring money can also make a difference to service providers' revenue. However, we should not forget the mechanical aspects of water delivery, such as pumps and dispensers – that remains a complex assembly. The technical infrastructure must be maintained and repaired. Overall, new technologies are changing the way we work and opening interesting prospects, but we should avoid mistakes: we will always need a competent sociologist to formulate survey questions, and an experienced technician to operate the pump.

Discussion with participants

Q: The need to have IT skills and access to technology is skewed towards international WASH experts or highly educated experts in countries. How can we improve inequalities in access to information? Should we expect a larger divide between the 'haves' and 'don't haves' with the advent of digital water?
DS (Dragan Savic): the divide is not that big, and developing countries have the ability to leapfrog some technologies (e.g. by going straight to mobile phones without having a landline). If we are talking about organisational divide with better infrastructures, water utilities are catching up. Education will play a role, and this is where online education, such as MOOCs, can help: therefore, the divide will be reduced by using digital technologies, and not increased.

Q: How can digital technologies be used in rural population where illiteracy is high?
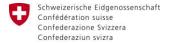AK (Annika Kramer): digital technologies will not be able to fight illiteracy, but they may provide new means of communication for the illiterate, for instance by using voice messages or icons instead of written messages.

Q: Is there any area in the water sector where you would like to see digital tools advancing but it is not possible yet e.g. because it is too expensive?
DS: Digital technologies are open to innovation such as water ATMs and smart hand pumps, which provide about the need for maintenance. We have not yet come up with all the solutions that the current technologies provide. Therefore, it is not the lack of new technologies that is limiting our ability to do something. For example, the technology of mobile phones is already there, but what is new is our way to use the technology, for instance by applying it for water payments.

Q: Can you discuss in your experience, any possible downfalls of using mobile pay functionalities for projects or interventions in development contexts?
AK: mobile phones functionalities should never be the only payment option; otherwise, the poorest without access to it might be even more disadvantaged. In addition, we should not only focus on the technological aspect, e.g. of pre-payments: What happens if there is no money left on someone's water account – does that lead to disconnection? This raises questions about the human right to water and the need to ensure a minimum access..

Q: The current discussion is focusing on WASH but there is much more, e.g. water resources management. For instance, should we expect more small-scale internet-based water trading similar to current small-scale energy trading on the Swiss market?
DS: Internet-based water trading is happening already – in California and in Australia for instance. I would argue that it would make water allocation more efficient for people using this particular service.

Q: How will digitalisation affect water pricing in the future?
AK: digitalization provides opportunities to identify inefficiencies as well as to collect payments more easily, and thus to make the water sector economically more efficient. The question of water pricing, however, is a political one that goes beyond digitalisation.

Webinar Resources

The recording of the webinar, as well as the presentations, are available on the RésEAU website.