**Report of the Workshop on ICT as an enabler for Smart Water Management**

**(Luxor, Egypt, 14-15 April 2013)**

The workshop on [ICT as an enabler for Smart Water Management](http://www.itu.int/en/ITU-T/Workshops-and-Seminars/ict-swm/201304/Pages/default.aspx) took place on 14-15 April 2013 at the Steigenberger Hotel, in Luxor, Egypt and was hosted by the Ministry of Communications and Information Technology. The event was the first of its kind and reflects the growing importance and acceleration of smart water standardization work in ITU’s Telecommunication Standardization Sector (ITU-T) in line with WTSA Resolution 73 on ICTs, Environment and Climate Change (Dubai, 2012). The outcome of this workshop was a Call For Action for countries in the Nile River Basin area to implement best practices for smart water management.

There were some 42 participants, including seven countries from Africa and Arab regions: Egypt, Mali, Niger, South Sudan, Sudan, Uganda and Palestine.

Economic growth, climate change and rising populations are all affecting the availability of water resources. According to UN estimates, 85 per cent of the world’s population lives in the driest half of the planet; 783 million people do not have access to clean water; almost 2.5 billion do not have access to adequate sanitation; and 6 to 8 million people die annually from the consequences of water-related disasters and diseases.

In opening the workshop Mr Malcolm Johnson, Director, Telecommunication Standardization Bureau, called for the stakeholders present at the event including: international and regional organisations; environment, agriculture, irrigation and communications ministries; government agencies; industry; and academia, to agree on actions that will help countries in the Nile River Basin, and others around the world facing similar challenges, to implement best practices and technologies for smart water management.

Dr. Awr Badawi, Executive Secretary, National Telecom Regulatory Authority (NTRA), Egypt, welcomed participants emphasising that he counted on the efficiency and energy of ITU to place this topic high on its agenda and to mobilize experts through its different study groups, focus groups, and other entities.

Some of the main points that emerged during the discussions at the workshop were:

* Water Scarcity is a real issue which will grow in importance in the near future compounded by the effects of climate change, rising populations and economic growth;
* There is a lack of information about methodologies on measuring water demand and supply for domestic and economic sectors as well as on the impacts of ICTs for water management;
* The water footprint could be an important indicator for assessing the water needs for various products and economic activities and to assess the impacts on water systems elsewhere (through estimates of green, blue and grey water footprints). Policy decisions should be taken on the basis of actual water footprint at the production location, and local impacts of the water footprint based on vulnerability and scarcity. Some examples of water footprint estimates for products:
  + One cup of tea: 30 litres of water
  + One cup of coffee: 140 litres of water
  + One kg of wheat: 1,300 litres of water
  + One hamburger: 2,400 litres of water
  + One pair of jeans: 10,855 litres of water
* About 98% of the irrigated land in Egypt is from fixed irrigation and the irrigation efficiency is about 50%. Using ICTs can help a lot to improve water efficiency use in agriculture;
* However, there is a lack of consistency on the amount that could be saved from use of ICTs. In one presentation, an example was given for 1 kg of tomatoes where use of ICTs could reduce the water consumption from 190 litres to 2 litres. In another presentation for the production of 1 kg tomatoes, the water consumption could be reduced from 300 litres, for an open field irrigation system, to 50 litres, in a protected agriculture drip irrigation system. A common methodology for assessing the impact of ICTs on water consumption in agriculture and production of goods is necessary. This work could be undertaken as part of [ITU-T Study Group 5](http://www.itu.int/en/ITU-T/studygroups/2013-2016/05/Pages/default.aspx) standardization activities;
* Improving the overall water use efficiency is important in order to minimize the losses in the system and distribute the available water for agriculture in an equitable way;
* For effective water management, a large amount of data is collected from various sources (e.g. rivers, utility networks, weather, etc.). By collecting them into one intelligent operations centre, a holistic view is created and this enables effective cooperation between various stakeholders. The data can also be extended to serve other domains such as emergency response, electricity, traffic, etc;
* With the impact of climate change, reliance on historical weather patterns is no longer viable for forecasting. The availability of information about current conditions in a particular situation, on a timely basis, is crucial for decision making in water resource management; looking at the climate change adaptation technologies pertaining to the water sector there is a need to foster knowledge sharing and replication among countries.
* Technologies such as semantic sensor web, geographical information systems, remote sensing, climate smart agriculture, M2M and smart pipes, smart metering, telemetry, geographic 3D modeling of geospatial data for the web and smart city ICT platforms are creating better and cost effective opportunities for smart water management. ITU Study Groups would have an important role to play in this area;
* In recognition of the important role ICTs play in the water management sector, ITU Regional Office for Arab Region is planning to initiate a pilot project on smart water management best practices for countries in the Nile river basin.

The workshop concluded with the adoption of a 10-point [Call to Action](http://www.itu.int/en/ITU-T/Workshops-and-Seminars/ict-swm/201304/Documents/CallAction_Final.docx) for ITU in collaboration with policy makers, water authorities, and relevant international and regional organizations, to:

1. **Lead with vision:** develop and foster the adoption of international standards, best practices, and policies for smart water management through the use of ICT to improve both water and energy footprints, taking into account life cycle assessments.
2. **Evaluate:** countries, standard performance indicators, and industry best practices for smart water management through the use of ICT and help countries to better utilize their water resources including different types of water.
3. **Standardize:** the methodologies for estimating the impact of ICTs on improving water conservation; the ICT applications and services for smart water management so as to ensure interoperability and benefit from economies of scale; technologies for intelligent decision making for smart water management; and use of geographic 3 D modelling of geospatial data for use in geographical information systems and on the Internet; and open data platforms to enable interoperability of smart water solutions.
4. **Think sustainable:** bridge the gap between ICT, water, environment, energy experts and policy makers, to encourage the integration of ICT into water and energy policies so as to improve knowledge on the state of water availability and consumption, increase environmental resilience, tackle climate change impacts, and enhance energy efficiency and water demand management with the help of a cost benefit analysis of ICT tools. Promote the use of open data platforms in water management to empower innovation in the field.
5. **Build a green economy:** promote green products and services based on international standards that are developed on life cycle assessment, and raise awareness on the blue, green, and grey water footprints of commonly used products, services, and economic activities.
6. **Share knowledge and raise awareness:** Work on the whole ecosystem by raising awareness about the potential of ICTs in water management especially among farmers and beneficiaries in general, encourage water education, training and skill development of water authorities in order to enhance expertise in smart water management applications and organize similar workshops on an annual basis to review progress made.
7. **Boost partnerships:** enhance cooperation at international, regional, and national level, between organizations, research institutes, governments, and civil society, on the use of ICT in smart water management, and encourage developed countries to support efforts in developing countries. Create business models that would encourage partnerships among stakeholders through win- win solutions.
8. **Shape the global agenda**: integrate ICT policies in the on-going dialogue on smart water management in organizations such as the UN Water, World Meteorological Organization (WMO), Food and Agricultural Organization (FAO) and United Nations Environment Programme (UNEP), and others.
9. **Demonstrate success and feasibility:** carry out pilot and flagship demonstration projects to demonstrate “smart” ICT solutions for water management in agriculture, industrial processes, and domestic water consumption and quality, by utilizing new technologies and standards for smart water management, and benchmarking the situation in different countries. Identify strengths and weaknesses of implementation strategies, and report success stories and cost implications in dealing with the challenges met, and innovative solutions used.
10. **Mobilize expertise**: In relevant ITU Study Groups, and other groups as appropriate to pursue work in this important area.

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