Report on Side Event:

Solution for Water Challenges of Non-Urban Area with Simple and Low-Cost Technologies

Seventh World Water Forum, Daegu, South Korea, 11:20 – 13:20, 15 April, 2015

Organizer: Japan Water Forum and Ad hoc Committee on Simple and Low-Cost Water Technology
Coordinator: Masao Yamada, Chairman of Ad hoc Committee on Simple and Low-Cost Water Technology
Moderator & Rapporteur: Victor Muhandiki, Nagoya University
Secretary: Akira Tadenuma, IWEB & Sombo Yamamura, Japan Water Forum

Introduction

The 2014 report of the World Health Organization/United Nations Children's Fund (WHO/UNICEF) Joint Monitoring Programme (JMP) for Water Supply and Sanitation estimated that of the 748 million people in the world who lack access to an improved drinking water source, 673 million (or more than 90%) live in rural areas, although since 1990 there has been a decrease in the urban-rural disparity gap in access in 87 of the 116 countries included in the study. Rural (non-urban) areas have often been left behind on development with large-scale investments and sophisticated technologies. Under such conditions, simple and low-cost technologies, which are easy to operate and maintain, are required. In this side event, a symposium was organized focusing on simple and low-cost technologies whose application is desirable in non-urban areas. Promising examples on drinking-water, wastewater treatment and human waste disposal were introduced, and future direction and policy to promote the technologies were discussed.

Opening Remarks

Prof. Masao Yamada (Chubu University and Chairman, Ad hoc Committee on Simple and Low-Cost Water Technology) opened the session by noting that it is well known that the set target of the Millennium Development Goals (MDGs) on sustainable access to drinking water has been achieved before the target year of 2015. However, in reality, more than 600 million people living in non-urban areas are still left behind. Moreover, sanitation remains off-track. This calls for concerted efforts to provide simple and low-cost technologies to address water challenges in non-urban areas.

Keynote Speech

Dr. Sombo Yamamura of Japan Water Forum gave a keynote speech entitled "Water-Related Challenges of Non-Urban Area and Possible Solution with Simple and Low Cost Technologies". The keynote speech emphasized the following five important aspects that should be considered when discussing about technologies that are suited to conditions in economically developing countries. The issues are listed in chronological order following world concern at each time: 1) The need for planners to integrate social and cultural factors into project design in order to ensure that the introduction of water supply and excreta disposal technologies will be accepted, properly used, and maintained was emphasized by the World Bank in a report entitled "Appropriate Technology for Water Supply and Sanitation" published in 1980; 2) Resource mobilization has been discussed a lot since 1980s in relation to the Water Decade. For example, the American Society of Civil Engineers (ASCE) published the report "Resource Mobilization for Drinking Water and Sanitation in Developing Nations" in 1987, in which human resource development, community education, and training of managers, technicians and professional engineers were discussed; 3) Affordable technologies drew a lot of interest when Base of the Pyramid (BoP) Business was highlighted in 2000s. In order to appeal to the BoP demographic, companies should design products and services that are useful and affordable. Water treatment technologies were compared from various viewpoints, which included treatment effectiveness, energy independence and ease/low cost of maintenance; 4) Life Cycle Cost (LCC) has also become an important view point for facility development. In order to obtain solutions for long, sustainable management of the water supply system, not only a lower initial cost but also total LCC for facility development should be considered in investment planning; and 5) Effectiveness and efficiency have also been highlighted in recent years. An example is Asian Development Bank's (ADB's) new scheme of Results-Based Lending (RBL), under which disbursements of loan proceeds are directly linked to achievements of program results. The objectives of RBL are to increase accountability and provide incentives to deliver and sustain results. This initiative may give more opportunities to encourage the use of simple and low cost technology.

Presentations and Panel Discussion

Five case study presentations were made followed by a panel discussion with the five presenters and Prof. Masao Yamada as panelists. Dr. Tommy K. K. Ngai of the Centre for Affordable Water and Sanitation (CAWST) presented on "Design, Promotion, and Adoption of Biosand Filters Worldwide". The biosand filter (BSF) is a simple filter constructed with local materials that is used at household level to treat water at a flow rate of up to 12 L/h. The

production cost of BSF ranges from USD15 – 40 depending on the country. So far, more than 650,000 filters have been used by more than 4 million people in 55 countries. The BSF is an appropriate technology for non-urban areas because: 1) It is simple in construction, operation and maintenance; 2) It is affordable; and 3) It achieves effective removal of pathogens and turbidity. It was noted that continued learning and improvement of both the technical design and the knowledge transfer process will accelerate BSF dissemination worldwide.

Dr. Kimiko Haraguchi of Kitakyushu Water and Sewer Association made a presentation on "Upward Biological Contact Filtration (U-BCF) for Advanced Water Treatment System". The U-BCF is an advanced method of treating water with high NH4 and organic content developed by Kitakyushu City in 1997 and is currently being used in the waterworks of the city. Compared with use of ozone-granular activated carbon (Ozone-GAC) for removing organic matter in drinking water, U-BCF is advantageous in terms of construction cost (50% of Ozone-GAC) and operation and maintenance cost (10% of Ozone-GAC). U-BCF has been applied in Haiphong City, Vietnam, through a technical cooperation project with Kitakyushu City.

Mr. Katsumi Iida (and Mr. Hiroshi Iida) of Kassui Plant Co. Ltd. presented on "Solution for Wastewater Treatment with Bio Mesh and Drinking Water Treatment with Wakishimizu". Kassui Plant Co. Ltd. produces various filters for wastewater and drinking water treatment that are used mainly in Japan but also overseas (Taiwan, Korea and Thailand). The Biotechnology Mesh (Bio Mesh) used in filter beds for wastewater treatment provides a large contact area for treatment, making the filter achieve higher treatment efficiency than a conventional activated sludge facility of equivalent capacity. The Wakishimizu (spring water in Japanese) is a filter for drinking water that combines various purification systems. Since the filter has a self-cleaning mechanism, it does not require exchange of the filter material which makes the design simple and low-cost.

Dr. Kunio Takahashi (and Prof. Sakai Akira) of Japan Association of Drainage Environment (JADE) presented about "Excrement Disposal by Eco-Sanitation in Bangladesh Rural Area). Ecological Sanitation (ecosan) toilets were first introduced in Bangladesh by JADE in 2004. Community Based Organizations (CBOs) have been established in villages where ecosan toilets have been introduced, and periodical follow-ups are being carried out by the CBOs. Furthermore, the CBOs have also started purchasing and selling dry feces as an organic fertilizer. Such activities by CBOs promote the realization of benefits from ecosan toilets and the spread of the toilets.

Prof. Naoyuki Funamizu of Hokkaido University made a presentation on "Improving Water and Sanitation System in Sahel Region: Sustainable Agro-Sanitation Model in Burkina Faso". Through a joint international research project, systems in which agriculture is linked with sanitation were introduced in Burkina Faso. A new business model emphasizing the following steps was developed: 1) Start from the user's point of view, 2) Analyze the user's value chain, 3) Include sanitation system in it, and 4) Make a close link between sanitation system and agriculture (Agro-Sanitation).

A panel discussion with the presenters as panelists and moderated by Prof. Victor Muhandiki of Nagoya University followed the case study presentations. The following were identified as major barriers to technology adoption that need to be addressed: 1) Lack of information, 2) Cost and performance, 3) Geographical location, 4) Development stage of the area under consideration, and 5) Connecting users/buyers with the suppliers. It was also emphasized that implementing sanitation projects is more challenging than water projects because people generally have low willingness to pay for sanitation. Further, it was emphasized that there is need to consider social aspects of technology transfer and acceptance ("soft aspects"), as opposed to only focusing on hard technologies ("hard aspects").

Summary and Concluding Remarks

In summary, the symposium emphasized that development of drinking water and sanitation systems in non-urban areas is a very important and urgent task that needs concerted efforts by all players in the water sector, governments, NGOs, enterprises, academia, and donors. In particular, NGOs and small- and medium-sized companies have important roles, because they are able to undertake businesses or activities using simple and low-cost technologies. In closing remarks read by Prof. Masao Yamada on behalf of Mr. Kotaro Takemura, Secretary General of Japan Water Forum, it was noted that the Japan Water Forum has recognized the importance of low cost and simple technologies in economically developing countries, and has prioritized them in its funding activities. He noted that the outcome of the side event will be disseminated widely throughout the world.

Please send comments to Dr. Sombo Yamamura (weri2013@sj9.so-net.ne.jp)

Supporting organizations and sponsors:

Moderator & Rapporteur: Prof. Victor Muhandiki, Nagoya University

Coordinator: Prof. Masao Yamada, Chairman of Ad hoc Committee on Simple and Low-Cost Water Technology

Dr. Tommy K. K. Ngai of the Centre for Affordable Water and Sanitation (CAWST)

Dr. Kimiko Haraguchi of Kitakyushu Water and Sewer Association

Mr. Katsumi Iida of Kasui Plant Co. Ltd.

Dr. Kunio Takahashi of Japan Association of Drainage Environment (JADE)

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Prof. Naoyuki Funamizu of Hokkaido University

A panel discussion with the presenters, moderated by Prof. Victor Muhandiki of Nagoya University

Comments from the floor

Audience

Closing Remarks