

Abstracts of Water Sector Case Studies contributing to the papers:

Diaz Anadon, Laura, Kira Matus, Suerie Moon, Gabriel Chan, Alicia Harley, Sharmila Murthy, Vanessa Timmer, Ahmed Abdel Latif, Kathleen Araujo, Kayje Booker, Hyundo Choi, Kristian Dubrawski, Lonia Friedlander, Christina Ingersoll, Erin Kempster, Laura Pereira, Jennie Stephens, Lee Vinsel, and William C. Clark. 2014. [Innovation and Access to Technologies for Sustainable Development: Diagnosing Weaknesses and Identifying Interventions in the Transnational Arena](#). Sustainability Science Program Working Paper 2014-01. Sustainability Science Program and Belfer Center for Science and International Affairs, Kennedy School of Government, Harvard University, Cambridge, MA.

Murthy, Sharmila L., Françoise Bichai, Sharon Davis, Mark Williams, Arani Kajenthira, and Daniele Lantagne. 2013. [Water Sector Discussion Paper: Background Paper for the Project on Innovation and Access to Technologies for Sustainable Development](#). Sustainability Science Program Working Paper No. 2013-01, September. Sustainability Science Program, Kennedy School of Government, Harvard University, Cambridge, MA.

Wastewater Reuse in Arid Environments: Lessons Learned from Australia and the Middle East By Françoise Bichai, Arani Kajenthira and Sharmila L. Murthy

Wastewater reuse, which is also known as water recycling, can be an effective water supply augmentation strategy, especially in arid regions of the world, such as Australia and the Middle East. Applying the seven-stage innovation 'life cycle' model developed in the Project on Innovation and Access to Technologies for Sustainable Development, this paper suggests that the key barriers and mechanisms relevant to wastewater reuse in these two regions occur at the Selection, Production and Initial Adoption stages. The Australian experience with water recycling highlights that barriers at the selection stage and at the initial adoption stage are closely intertwined. Laws and regulations are by nature political, and thus influenced by cultural norms that create adoption barriers. As a developed country, Australia has less production barriers than developing countries, but the existing centralized sewerage and supply system creates path dependency, as retrofitting is expensive, which also in turn, limits the adoption of decentralized water recycling options. The seminal lesson from Australia's experience is that as a supply augmentation strategy, wastewater reuse requires coordinated, long-term planning. In the Middle East, significant legal and regulatory barriers also exist to effective wastewater reuse, which create both selection and initial adoption barriers. While standards for non-potable uses have been developed in some countries, there is not sufficient enforcement. Production is another challenge because wastewater treatment facilities in the Middle East often lack capacity to treat water, due to a failure of system integration in the collection, treatment and distribution of wastewater. Cultural barriers and path dependence also create adoption barriers. Due to the paucity of water, desalination is often a necessary supply augmentation strategy, but such investments create path dependence. Insights for transnational actors include the need to support country-level legal and regulatory efforts, and investments in water recycling infrastructure in contexts that support its sustainable use.

Access to Safe Water: An Analysis of Ceramic Pot Water Filters

By Mark Williams, Sharmila L. Murthy, and Daniele Lantagne

Where infrastructure barriers prevent the effective delivery of clean drinking water through centralized systems, household water treatment and storage systems (HWTS) can be an effective interim solution that enables users to treat the water in their homes and thereby reduce the incidence of water-borne diseases. This case study focuses on the use of ceramic pot filters (CPFs), which have been widely promoted as a low-cost and simple-to-use option for treating water, especially water with medium to high turbidity (i.e. water that has significant particulate matter making it “muddy”). Other promoted benefits are that CPFs use no chemicals and can be locally produced – and thus provide jobs to the local community. However, as this case study makes clear, real-world factors negatively impact their efficacy and effectiveness in the field. The zeal and enthusiasm that donors and aid agencies have traditionally shown for HWTS, like CPFs, needs to be critically examined to assess the true impact of these projects. Applying the seven-stage innovation ‘life cycle’ model developed in the Project on Innovation and Access to Technologies for Sustainable Development, this paper suggests that the most critical barriers occur at the Production stage and the Widespread Use stage, and to a lesser degree at the Selection stage. Within the production stage, barriers relate to lack of capacity, production standards, and physical infrastructure. With respect to widespread and sustained use, the most significant obstacles relate to lack of access to information, behavioral change, design, maintenance, cost, and commercial appeal. To a lesser degree, the selection stage is a chokepoint because of split agency decision-making. The analysis suggests that other HWTS products, such as hollow fiber filters and flocculation/disinfection products, suffer from similar barriers. Key insights are drawn for transnational actors, such as the need to develop generalizable production standards, to promote user-friendly products, and to assess the actual impact of HWTS interventions, including those that rely on CPFs.

The Role of Mobile Technology in Improving Access to Water, Sanitation and Hygiene (mWASH)

By Sharmila L. Murthy and Daniel Shemie

Mobile applications are increasingly being used in water, sanitation and hygiene services. These “mWASH” applications present an opportunity to examine how the global innovation system is being harnessed to address information and communication challenges associated with poor water and sanitation – especially considering that more people are estimated to have access to a mobile device than to a toilet. The case study offers a comparison of several emerging mWASH applications based on whether the target decision-maker of the information collected is a resource allocator (i.e. funder or government agency), service provider (i.e. water utility) or water user (i.e. individual customers). The analysis, based on the seven-stage innovation ‘life cycle’ model developed in the Project on Innovation and Access to Technologies for Sustainable Development, suggests that the most critical barriers to widespread use of mWASH applications occur at the Adoption phase. While specific challenges differ depending on whether the target decision-maker and end-user are individuals or organizations, the main barriers to adoption relate to cultural barriers and beliefs, lack of capacity, infrastructure challenges and costs. However, evidence also suggests that many of these barriers could be overcome through effective adaptation. Several key insights that may be of particular interest to transnational actors include the importance of (i) an institutional culture of openness; (ii) learning from a proof of concept; (iii) donor support for trial and error; (iv) the direction of communication

flows; (v) the role of supply-driven policies; (vi) investing in open source technology; (vii) transparency regarding total cost of implementation (as compared to the cost of the mobile invention); (viii) 'big' infrastructure, such as access to electricity and networks; and (ix) user-centered design.