

American Water Resources Association
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Problems

September 10-11, 2017
Tel Aviv University, Tel Aviv, Israel

Sunday, Sept. 10

10:30 AM – 12:00 Noon

SESSION 3: Mechanisms for Understanding and Influencing Water Use

Enhanced Water Resource Decoupling in the Jordan Basin Riparians: The Case for Sharing Best Practice - Michael Gilmont, University of Oxford, Oxford, UK (co-authors: N. Tal, M. Bundokji)

In Jordan and the Palestinian Territories, water scarcity and food insecurity are increasingly understood as existential threats to human security and the natural environment. Israel, which shares a similar geography, has managed to increase agricultural production while reducing pressure on water resources through modifications to agricultural composition and practices. Agricultural water productivity is one important component by which a country can 'decouple' its growing economic and social water needs from internal water resource supply. The other mechanisms Israel has adopted are economic diversification away from agriculture, increased import of water-intensive foods, and the use of non-natural water sources including recycled effluent and seawater desalination. Such are these combined trends that despite significant expansion of water use and over-abstraction of natural water resources, up to the 1990s, today Israel is using the same volume of natural freshwater as it was in 1960, despite a four-fold population growth, and sixteen fold economic growth. Jordan today is facing significant water scarcity, exacerbated by hosting Syrian refugees. Even with new groundwater, effluent and desalination capacity planned to 2025 and continued over-exploitation of renewable groundwater, there remains a deficit between anticipated demand and available supply. This paper draws upon recently completed work carried out by research consortium led by Oxford University, along with EcoPeace Middle East in Israel and the Palestinian Territories and WANA institute in Jordan. It updates the story of Israel's decoupling trajectories, showing a new equilibrium in use of natural freshwater since 2009. We then explore an analysis of trends for Jordan, showing considerable use economic diversification, food trade, water productivity, and wastewater reuse to circumvent its resource limits. We then present new secondary data analysis of comparative agricultural water productivity across Israel and Jordan, demonstrating that, for Jordan, a 30% reduction in current agricultural water use could be achieved by moving towards Israeli levels of water productivity. Further options to enhance decoupling through food trade and increased wastewater recycling are also explored, and show that these instruments can eliminate the extant gap between projected demand and planned supply and all but reduce unsustainable use of groundwater that exists in the current Jordanian water plan to 2025. Finally we examine provisional evidence on the gap between agricultural water productivity between Israel and Jordan and the Palestinian Territories at the farm level, and highlight the importance of central sources of knowledge and expertise for Israeli and Palestinian farmers that is lacking in Jordan. Other key areas of difference highlighted include along with a challenging environment for funding on-farm technical and knowledge improvements, and scope for improved coordination of policies between water and agriculture in Jordan and the Palestinian Territories. This paper therefore demonstrates a promising avenue for improved regional water security within the current limits of water availability, by drawing on regional best practice, but shows significant knowledge and institutional challenges to achieving this.

Understanding Israeli Water Customer Preferences for Online, Feedback Technologies - Amir Cahn,
SWAN Forum, Tel Aviv, IL, Israel

Since its inception, Israel has been a pioneer in water demand management (WDM) implementing such policies as water pricing, use restrictions, public awareness campaigns, and water saving devices. From an early age, Israelis are taught to save water, which is essential since WDM strategies often require awareness and behavioral change to be effective. Recently, Israel introduced a new, technologically-oriented WDM strategy in the form of smart water meters. These devices allow Israeli water utilities to track residential water consumption in real-time to understand how and when water is used. Utilities can then relay this information back to the customers through mobile apps, known as 'online feedback,' to alert them about abnormal consumption. Israel's Water Authority is currently updating its service requirements, which would require all water corporations to inform their customers if there is a leak on their premises. To do so, corporations will need access to real-time information. An important research question is: can feedback technologies actually impact the behavior of customers insofar as their domestic water use is concerned, and if so, how? Up until now, there have been relatively few studies on this topic. This study assesses Israeli customer preferences and opinions on the usefulness of such feedback technologies by conducting focus groups in three Israeli cities: Modi'in, which introduced an online water feedback application (app) in 2014, Ra'anana, which plans to in 2017, and Nes Ziona, which is considering it. Focus groups can help shape decisions during the development of an initiative, allowing lessons to be learnt and recorded, and improvements to be made both within the current program, as well as in future work. It is important to understand what works well and less well so that efforts and resources are used in the most effective way. This study provides several insights into Israeli water customer preferences for online feedback technologies. When examining water behavior incentives, the focus groups revealed a greater interest in environmental conservation than economic concerns, possibly due to the low price of water. However, participants were not interested in learning about their daily water consumption, but instead preferred to receive alerts only about urgent matters such as a leak in their home or abnormal consumption. Regarding notification preferences, participants favored receiving SMS messages rather than downloading an app that they may not check, could take up phone memory, or perhaps show advertisements. This information can be used in future strategic messaging. The focus groups results also demonstrated the marketing of the app was not reaching much of the target consumer base. For example, in Modi'in, none of the focus group participants knew of their city's online feedback app, even though it was heavily advertised through the local newspaper, social media, and utility website. Each focus group also offered several new app feature ideas and marketing tips to improve the app value and raise public awareness. Israeli cities, technology providers, and water utilities can use this study's findings useful to better engage customers and keep them informed about their water use.

Socio-cultural Drivers of Water Demand in Student Residential Accommodation - Chad Staddon,
University West of England, Bristol, Bristol, UK (co-authors: K. Simpson, D. Toher, F. Jeddere-Fisher)

In 2012 UWE, Bristol entered into partnership with Bristol Water Plc (the local water services company) to initiate a longitudinal, multimethod study of water consumption by students in first year accommodations on the main UWE campus at Frenchay, Bristol. Now in the fourth full year cycle (each runs from September to June, following the academic year) of this study we are in a position to report on patterns of water consumption, underlying socio-economic drivers and the impacts (or not) of both 'hard' (new fixtures such as low flow showerheads) and 'soft' (conservation messaging and engagement activities) attempts at achieving greater water savings. So far, one of the surprise findings has been that

behavioural adaptation can easily offset any initial water savings sought through hard interventions like showerhead replacement. We have also found that our growing dataset has considerable application in facilities management as well as water conservation planning.

Getting to Yes: U.S. Models for Resolving Complex Groundwater and Environmental Problems –

Joshua B. Epel, Former Chairman Colorado Public Utilities Commission and Chairman of the Colorado Oil and Gas Conservation Commission)

Denver, CO