

Regional pathways out of national water scarcity: a regional analysis of water resources of Israel, The Palestinian Authority and Jordan.

MICHAEL GILMONT^{*1}, SHADDAD ATTILI⁵, SULEIMAN HALASAH⁴, DEBORAH SANDLER³, JIM HALL²

¹University of Oxford, ²University of Oxford (Department of Geography), ³University of Oxford/ Arava Institute for Environmental Studies, ⁴Igreens, ⁵Damour for Development

(a) Purpose of study or research hypothesis

The Jordan Basin region (Israel, Palestinian Authority and Jordan) suffers from acute water scarcity, in a region that has already demonstrated links between political vulnerability and water-related threat multipliers in Syria. This paper aims to quantify the current regional shortfall in the three jurisdictions and show how regional cooperation through technology and institutional best practice can alleviate current shortfalls, reduce energy intensities of new supply and incentivize cooperation between neighbors through mutual risk reduction and enlightened self-interest.

(b) Key issue(s) or problem(s) addressed

The Jordan Basin region suffers from extreme water scarcity, with all surface and groundwater at, or beyond sustainable utilization of c.2260mcm/year. Israel has successfully mitigated its water scarcity through an multifaceted program of desalination, wastewater development and intersectoral cross-substitution, and agricultural water productivity and reallocation, and is planning a slight water surplus by 2030. Jordan and the Palestinian Authority meanwhile have insufficient infrastructural plans to meet their 2030 needs, for neither current per-capita allocations, nor growth to WHO minima. Israel's planned 2030 excess is also insufficient to meet the Jordanian and Palestinian shortfall, however this paper illustrates how regionally proven approaches can help bridge the looming gap.

(c) Methodology or approach used

The methodology is based on a review of renewable water resource assessments for the region, combined officially available national water accounts for the past 10 years. For the first time we create a comparable picture of resource availability and demand at the regional level to 2030, based on published figures or per-capita extrapolations. The analysis shows a regional deficit of 230mcm/year by 2030. We then simulate regionally feasible scenarios to meet this deficit plus contingencies.

(d) Results or conclusions derived from the project

The paper demonstrates that the anticipated deficit in the region can be more than met through recycling of urban wastewater, based on combining anticipated 2030 urban demand with currently achieved inter-sectoral recycling rates in Israel. This pathway further demonstrates significant savings in energy compared to desalinating similar quantities of seawater. To implement such a pathway would involve sharing both of institutional and technological knowledge between Israel and its neighbors, as well as cooperation on development of infrastructure and distribution of resources especially between Israel and the PA around cross-border infrastructure. It further has the potential to be rolled-out on a community-drive incremental basis.

(e) Implications of the project relevant to congress themes

The research contributes to Theme E, particularly E1 Management of Transboundary resources. It

demonstrates how pooling of projected capacity plus implementation of achievable regional best practice provides a pathway to alleviate anticipated shortfalls in resources.

Keywords : Water Deficit, transboundary cooperation, track II diplomacy, treated effluents, regional best practice, enlightened self interest