Quantifying the actual benefits of large-scale seawater desalination in Israel

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ABSTRACT

Israel’s master plan for integrating large-scale seawater desalination plants within the national water supply system was drafted in the year 1997. This master plan sought not only to minimize the costs of these additional water sources, \textit{inter alia} through plant siting, economies of scale, and maximizing utilization of existing infrastructures, but also to maximize their benefits. Some of the benefits, particularly those resulting from higher product water quality requirements, justified, on a cost-benefit ratio basis, corresponding slight increases in the costs of desalinated water production. At the end of 2011, desalinated seawater was supplied continuously and reliably into the regional and national water grids from three large plants, Ashkelon, Palmachim, and Hadera, at the rate of about 300 million m\textsuperscript{3}/year. This quantity represented about 42\% of all the potable water inputs into these grids (other inputs were groundwater and Sea of Galilee water). In three years, by the end of 2014, two additional large plants, at Soreq A and Ashdod, and an expanded Palmachim plant will be producing an additional 300 million m\textsuperscript{3}/year. The paper revisits the benefits foreseen in the original desalination master plan, quantifies them on the basis of actual data accumulated over the past year and some new studies on the economic effects of water shortages and water supply quality, compares them with past expectations, and projects them to 2014, when about 80\% of grid supplied water will be desalinated seawater.

Keywords: Israel’s national water supply system; Desalinated water quantity and quality related benefits

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