

# The Red Sea-Dead Sea Project Update

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The Dead Sea is a terminal lake with great historical, cultural, and economic significance. The sea sits at the confluence of East and West, on the borders of the Hashemite Kingdom of Jordan, Israel, and the Palestinian National Authority, an area that has transported people, goods, and ideas for generations. For at least the past 150 years, serious proposals have been made to engineer a connection between the Red Sea, the Mediterranean Sea, and the Dead Sea. The political, social, water, and environmental needs of the region have each, over time, contributed to the endurance of this idea; hammers, as they say, tend to manifest a great deal of nails, and humans have an affinity for large, complex hammers. Over time, the proposal has been offered as a means to facilitate transportation, generate electricity, supply freshwater through desalination, and advance broader regional peace and economic development. This Water Brief report summarizes both the history of and recent events in the proposals to build major infrastructure in this region.<sup>1</sup>

## Projects to Improve Transportation

The first proposals date as far back as the 1850s, when the British suggested that a canal linking the Red Sea to the Mediterranean Sea could serve as an alternative to the Suez Canal as a route from Europe to India (Allen 1855). Political considerations regarding Egypt made finding alternatives to the Suez Canal attractive for the British and then for Israel (Ofner 1946; *New York Times* 1956). As early as 1883, a British member of Parliament noted the “immense importance of obtaining, if possible, a waterway to India independent of the Suez Canal, and all its untoward complications” (Martin 1883). The idea persisted through the mid-twentieth century (Wallenstein 1966). As proposed, creation of a waterway suitable for navigation would completely alter the local environment and would flood important cultural, religious, and historical sites (*San Francisco Chronicle* 1883). Ultimately, Israel chose to build a rail system over a canal to link the Mediterranean to the Red Sea, although even this project was never completed.

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1. We chose not to include this section in the earlier chapter on zombie water projects because it isn't clear that the idea is fully dead—yet.

## Projects to Expand Energy

As the lowest point on Earth, the Dead Sea has tremendous potential for hydroelectric power generation. In 1902, Theodor Herzl, the founder of modern Zionism, wrote about a canal that would take advantage of the 400-meter (1,310-foot) elevation difference between the Red Sea and the Mediterranean to generate hydroelectric power. As the cost of oil rose in the 1970s, Israel began studying the feasibility study of a canal project for energy generation, with navigation listed only as a potential “fringe” benefit (Torgerson 1979). Jordan objected to the plan, as one option would have passed through the Gaza Strip, and in response began studying the feasibility of a hydropower canal from the Red Sea to the Dead Sea (Khouri 1980). Over time, canal proposals have considered other kinds of energy generation besides hydropower, including nuclear power and solar energy fields (Wallenstein 1966; Torgerson 1979). Although energy generation would also become another “fringe” benefit of future canal proposals, it remains a key component to reducing overall project costs.

## Projects to Produce Freshwater

The project began to take its modern shape during the Middle East peace talks in the early 1990s, when freshwater scarcity and drastically increasing populations were threatening the water security of the entire region (Wolf and Newton 2007). In order to address some of the region's critical water issues, the peace process brought about the formation of the Multilateral Working Group on Water Resources. At a meeting of the group in 1993, Israel proposed desalinating Red Sea water to provide 1 billion cubic meters of water to the region, particularly Jordan (Schmetzer 1993).

It was envisioned that this project would be part of a much larger regional economic development plan to facilitate peace, with the *London Observer* calling it “the development centerpiece of the Middle East peace accords” (Holmes 1994; *Wisconsin State Journal* 1994; Land 1994). Both sides began referring to the section of the Jordan Rift Valley between the Red Sea and the Dead Sea as “Peace Valley” (Peres 1994). However, by 1995 the project had been shelved as a result of onerous bureaucracy, deteriorating relations, lack of funding, and failure of the parties to agree on design and management. At that time, the project was estimated to cost \$4.2 billion, and the World Bank and other international monetary officials were making it clear that the money would not come from the international community (Rodan 1995; Izenberg 1997). There would be little movement on the idea until changing circumstances offered a fresh application for the proposal.

## Projects to Restore the Dead Sea

The Dead Sea has slowly been shrinking throughout the twentieth and twenty-first centuries. Israel, Jordan, and Syria began diverting the Jordan River in the 1960s, and everyone knew that the Dead Sea would slowly disappear as a result (Wallenstein 1966). Located in an area that receives less than 100 millimeters (under 4 inches) of rain per year and where temperatures often exceed 45°C, the Dead Sea is completely reliant on

inflow for its continued existence. It is estimated that the total inflow to the Dead Sea has been reduced from around 1,250 million cubic meters (MCM) per year in 1950 to around 260 MCM per year in 2010. Furthermore, much of the water left in the lower Jordan River consists of raw sewage, agricultural runoff, fish pond water, and saline spring water (Gafny et al. 2010). Lucrative chemical production facilities on the southern shore of the sea have also contributed to the decline. In order to extract potash and other chemical products, the chemical industries pump water from the upper Dead Sea to the lower section, into solar evaporation ponds. Without this pumping, the southern Dead Sea would completely dry up. Paradoxically, the southern portion of the sea is now suffering from rising levels: waste materials left over from the mineral extraction process are causing the water levels to increase by 20 centimeters per year. This means that the majority of the tourism activity taking place on the Israeli side of the Dead Sea is at risk from flooding, and large-scale dredging plans are being discussed (Udasin and Hartman 2011).

The Dead Sea shoreline now sits 426 meters (m) below sea level, more than 30 m lower than in the 1960s. Without any intervention, the sea is expected to drop by another 150 m, stabilizing around 543 m below sea level, by the mid-twenty-second century (Coyne et Bellier et al. 2012).

Although one canal project noted the replenishment of the Dead Sea as a potential benefit as early as the 1980s (Khouri 1980), the idea would not take prominence until the late 1990s, when sinkholes began to appear on both the Israeli and Jordanian shores. Sinkholes form when declining sea levels move the interface of fresh and saline groundwater, bringing undersaturated water into contact with salt formations. This freshwater dissolves these formations, leaving behind underground caverns that can eventually collapse (Yechieli et al. 2002). These sinkholes have swallowed up roads, houses, and other infrastructure on the shorelines,<sup>2</sup> which has had, and will continue to have, negative consequences for the local and national economies.

## A Combined Plan

In 2001, the Center for Middle East Peace and Economic Cooperation revived the concept, in a project dubbed the "Peace Conduit," this time with saving the Dead Sea as a major objective, with other benefits being the production of drinking water, generation of hydropower, and a reduction in regional conflict (Lazaroff 2001). Israel and Jordan announced their commitment to the project in 2002 during the World Summit on Sustainable Development in Johannesburg, South Africa (Gavrieli and Bein 2007).

In 2005, Israel, the Palestinian Authority, and Jordan signed an agreement for a \$15.5 million feasibility study, funded through a multidonor trust fund administered by the World Bank (Al Bawaba 2005; Urquhart 2005). In 2013, the World Bank issued the final three draft reports: a feasibility study, an environmental and social assessment, and a study of alternatives.<sup>3</sup> The reports tentatively conclude that a \$10 billion pipeline is feasible, though risky and not without environmental and social impacts.

The proposed plan would convey 2,000 MCM per year of Red Sea water to a desalina-

2. Sometimes even people: [http://www.nbcnews.com/id/31475786/ns/world\\_news-environment/t/dead-sea-sinkholes-swallow-plans/#.UVgTQaLZ7jI](http://www.nbcnews.com/id/31475786/ns/world_news-environment/t/dead-sea-sinkholes-swallow-plans/#.UVgTQaLZ7jI).

3. The World Bank held a series of stakeholder meetings in February 2013 and planned to issue the final report documents in June (World Bank 2013).

tion plant in Jordan, south of the southern tip of the chemical industries' evaporation ponds. By 2060, the plant would produce more than 820 MCM per year, with 550 MCM per year for Jordan, 60 MCM per year for Israel, 60 MCM for Palestine, and 200 MCM left unallocated. Despite the inclusion of a hydropower facility in the preferred option, by 2060 the desalination plant would still require at least an additional 6,140 gigawatt-hours of energy per year.<sup>4</sup> Leftover brine waste would be used to replenish the Dead Sea, stabilizing the level around 416 m below sea level by 2054. Potential impacts from this brine include precipitation of gypsum, which could create whitening events, stimulate algae blooms, or otherwise alter the water's aesthetics.

## Criticisms of the Project

It is unclear whether an effective multinational organization could form and carry out such a cumbersome and lengthy project. In order to access international support and financing, the project partners would need to set up a legal and institutional framework "founded on internationally accepted law and good practice" (Coyne et Bellier et al. 2012). That could mean Israel would need to recognize that the Palestinian Authority has rights to the Dead Sea, which it has not yet done. As noted in the feasibility study, "one particularly powerful lesson to be learnt from experience elsewhere is that good governance requires a strong and autonomous regulatory authority." It has not yet been made clear what kind of regulatory authority could be created, how it would operate, who would pay for it, and what its roles and responsibilities would be.

Moreover, anti-Israel sentiment is high in Jordan and the Palestinian Authority, and any collaborative projects are often widely perceived as "normalizing" the occupation in Palestine. The feasibility study and other reports have considered a Jordanian-led project, with bilateral agreements set up to sell water and electricity to Israel and Jordan. However, a unilateral project would still require multinational cooperation and agreement.

None of the individual countries has the financial means or political support to unilaterally move forward, and international financing is crucial. Although the feasibility study considered whether the project could be built in phases in order to alleviate some financial pressure, the study concluded that at least 75 percent of the project's total capacity would be needed in the first phase to make the project financially viable. The feasibility study concluded that a mix of funding sources would be needed in order to meet the \$10 billion price tag, and it outlined a list of preconditions that international financiers would likely have prior to investing, including implementing multinational agreements, making improvements to existing water infrastructure, and increasing the institutional capacity of the water sector.

In addition, environmental organizations and the chemical industries remain critical, citing concerns about Dead Sea and Red Sea water quality and environmental impacts, as well as potential environmental and groundwater impacts in the Arava Valley. Both Israel and Jordan harvest chemicals from the rich, mineral-laden waters of the Dead Sea, and industries on both sides of the border are concerned that the impact of

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4. Energy and cost estimates include the energy required to pump potable water to Amman but not to Israel or the Palestinian Authority.

mixing the desalination brine with water from the Dead Sea will threaten their lucrative operations.

The freshwater component of the project, while important, is less pressing now than it was at the beginning of the twenty-first century. Israel is already moving forward with its own coastal desalination program, which is expanding the freshwater available internally. The feasibility study concluded that it would be economically feasible to deliver water only to the low-elevation demand centers in the Dead Sea basin and the Arava Valley, where demand has been estimated to be 60 MCM per year. It is unclear whether the benefits of the project offer enough incentive for Israel's continued participation. In Jordan, the Disi Water Conveyance Project is expected to be completed in 2013 and will transport 100 MCM of water to Amman from the Disi Aquifer, which lies beneath southern Jordan and Saudi Arabia. Although the pressing need for freshwater in Jordan is expected to be temporarily assuaged by the project, water from this groundwater basin is not a sufficient or sustainable supply.

The idea to link the Mediterranean Sea or the Red Sea with the Dead Sea is not new, although the purpose and scope have changed considerably over time. The factors that have influenced these changes—population, politics, economics, and natural resource needs—are not static and will continue to shift. It is unclear whether the proposed alternative, or some other iteration, can meet all these needs simultaneously and for all stakeholders in the region.

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