

Red Sea – Dead Sea Canal and the Feasibility Study of the World Bank



Background

The Dead Sea is drying out. Whereas its water level was approximately 389m below mean sea level in 1970, it has fallen to - 427 m in the meantime. The immense diversion of water from its main tributary, the Jordan River, and the over-exploitation of water resources of the Dead Sea by the mineral extraction industry have done great damage to the salty lake. Now, water from the Red Sea shall help. The idea to construct a canal between the Dead Sea and the Red Sea is old. Already at the end of the 19th century such a canal was discussed as a means of transport and for energy production. Since the presentation of the so called Peace Conduit project from the Red Sea to the Dead Sea by the governments of Israel and Jordan at the World Summit in Johannesburg 2002, the initiative gained in importance. Shortly afterwards, also the Palestinian Authority supported the project and in May 2005, the three riparian states approved the realisation of a **feasibility study**. The study was carried out by the World Bank and was funded by a multi-donor trust fund, which was established in December 2006. France, Greece, Italy, Japan, South Korea, The Netherlands, Sweden, and the United States of America contributed about 16.7 million U.S. dollars to the study programme. In July 2012, a [summary of the study](#) was published by the World Bank. The full reports of the study are available upon [written request](#).

The Feasibility Study of the World Bank

Three different water conveyance systems with either a high or a low level desalination plant were examined. Based on the study, the optimum system configuration is a pipeline conveyance combined with a high level desalination plant. From an eastern intake site at the Gulf of Aqaba 2,000 million m³ of water per year shall be pumped onto an elevation of 220m before being redirected for a distance of about 174km towards the Dead Sea. The difference in elevation of around 650m shall be used to operate a **hydroelectric power plant**. The generated energy shall then be used for the **desalination plant**. Altogether around 850 million m³ of seawater shall be desalted annually, in order to provide Israel, Jordan and the Palestinian Territories with **drinking water**. The remaining brine shall also be fed into the Dead Sea. The objective is to **stabilize the water level of the Dead Sea at an altitude of minus 416m by 2054**. With the assumed construction duration of six years, the Red Sea – Dead Sea Canal could be ready in 2020.

The full costs of the project are estimated to sum up to about **11.1 to 11.3 billion U.S. dollars**. This estimate includes expenses for intake works, the pumping station, the main water conveyance (tunnel and steel pipes), desalination facilities, hydropower plants, the restitution canal, the connection to the transmission grid, the project management, the establishment of necessary institutional structures as well as the water transmission to Jordan, Israel, and Palestine. In addition, **operation and maintenance costs add up to about 400 million U.S. dollars per year**. This sum will increase to about 660 million by 2060.

Potential sources of initial finance include beneficiary government equity / public funding, multilateral loans, private equity, grants, donations, soft loans, export credit as well as contractor finance. The operation and maintenance costs shall be recovered through the tariffs for potable water and hydro-electricity.

Red Sea – Dead Sea Canal and the Feasibility Study of the World Bank



Despite the ecological, economic and social risks, the study concludes that the project is not only technically and economically feasible. Also the environmental and social impacts are believed to be acceptable.

What do supporters say about the Red Sea – Dead Sea Canal?

For the supporters – mainly policy makers and bureaucrats in the riparian countries at the Dead Sea - the canal is the only means to save the Dead Sea. The rising sea water level would boost international tourism and protect the mineral extraction industry from losses generated by the decline of the sea water level. In addition, the fresh water demand of the region could be covered thanks to the canal. Since this project is a joint initiative of the Israeli, Jordanian and Palestinian governments, the canal is also regarded as an important step towards cooperation and peace in the Middle East.

What do opponents say about the Red Sea – Dead Sea Canal?

Sceptical comments come from regional and international scientists and environmental organisations. Though all parties support joint approaches to save the Dead Sea, from the opponents point of view other options should be examined in order to provide sufficient water for man and nature in the Dead Sea region.

The rehabilitation of the Lower Jordan River and the Dead Sea is the central aim of Friends of the Earth Middle East (FoEME), a unique organisation founded in 1994 that brings together Israeli, Palestinian and Jordanian environmentalists. Together with FoEME, Global Nature Fund (GNF) has organised several discussion panels and expert meetings in Israel, Jordan and the Palestinian Territories to discuss possible consequences of the construction of the canal as well as alternative solutions to the most urgent problems at the Dead Sea with government representatives, scientists and local stakeholders. It turned out that there are still a lot of questions to be answered:

- What are the dangers of water intake for the **delicate coral reefs in the Gulf of Aqaba**?
- How will the construction of the pipeline affect the **natural landscape of the Arava Valley** (the section of the Jordan Rift Valley running in a north-south orientation between the southern end of the Sea of Galilee down to the Dead Sea)?
- How much **gypsum** will be built in the Dead Sea due to mixing the sulphate-rich water of the Red Sea with the calcium-rich water of the Dead Sea?
- How can the **possible development of algae** due to the different salt content of the waters be prevented?

Even from an economic point of view the project remains questionable. Depending on the amount of gypsum crystals that might be built, the Dead Sea could turn white, which would negatively affect both the tourism sector as well as the mineral extraction industry. Moreover, the energy produced in the hydropower plant is neither sufficient for the operation of the desalination plant nor for the pumps that transport the drinking water to the cities. According to the World Bank study **the net energy balance will be -2,530 GWh/year in 2020**. By the year 2060, the net energy balance will reach

Red Sea – Dead Sea Canal and the Feasibility Study of the World Bank



about – 6,140 GWh/year. It needs to be emphasised that the energy needed to pump the drinking water to Israel and Palestine was not even considered in these calculations. Furthermore, the costs for the produced drinking water will vary between 1.7 and 2.7 U.S. dollars per cubic meter in Jordan and will thus be unaffordable for the local population.

Problems might also occur from a technical point of view. Pipelines are prone to **leakages**, which can continue undetected for many years and which might harm valuable groundwater resources. In addition, the region between the Red Sea and the Dead Sea is **seismically active**: a strong **earthquake** might damage the pipeline.

From the perspective of Palestinian non-governmental organisations, the plan to construct such a pipeline **undermines Palestinian water rights**, as the massive water abstraction from the Lower Jordan River and the Palestinian dispossession from the river would be legitimised. Palestinians would end up paying a high price for desalinated drinking water, even though they are entitled to the free use of the water of the Jordan River.

The World Bank also published a study of alternatives, but FoEME criticises that this study was entrusted to experts picked by Israeli, Palestinian and Jordanian governments and thus represents a breach to neutrality. According to FoEME, the study should be undertaken in an independent and comprehensive fashion by international consultants. Even though an Independent Panel of Experts (IPE) was appointed by the World Bank to oversee the study, it is not clear what powers, if any, the IPE has to address deficiencies in the study process and to challenge its results. Another indicator for the lack of transparency is the fact that the World Bank does not make documents related to decisions and/or compromises made by the Bank and the international consultants regarding the level of scientific study publicly available.

In addition, only half a million U.S. dollars were spent on examining alternatives. This fact shows that alternative options have not been tested nearly as intense as the feasibility of the Red-Dead Canal. That, in turn, puts the statement of the World Bank to try to find the best solution to save the Dead Sea in question.

Alternatives to the Red-Dead Canal

Instead of investing billions of U.S. dollars in a project whose economic, environmental and social consequences cannot be predicted, the causes of the problem should be addressed: the massive diversion of water from the main tributary of the Dead Sea, the Jordan River, as well as the overexploitation of the water resources of the saline lake by the mineral industry.

Already [400-600 million cubic meters of water](#) would be sufficient to bring the water flow of the Lower Jordan River back to an acceptable level. According to a [study](#) conducted by FoEME, dedicated water saving and water demand management projects may **save / generate up to a billion cubic meters of water** in the riparian countries. On the supply side, large quantities of water can be saved through rainwater collection, the reduction of water losses due to evaporation from exposed man-made reservoirs and reduction of water losses due to leakages. On the demand side, water can be

Red Sea – Dead Sea Canal and the Feasibility Study of the World Bank



saved through the reduction of water consumption through awareness raising campaigns, consumer-oriented water tariffs and the reuse of grey-water for domestic purposes, such as toilet flushing. Water saving potentials in the agricultural sector are also high: whereas agriculture uses more than 50% of all the water in Israel, it only contributes around 2% to the gross domestic product. By changing cropping patterns, using treated waste water, removing import barriers of water-intensive crops and by improving irrigation technologies large amounts of water can be saved.

In addition to the **rehabilitation of the Lower Jordan River**, the **mineral extraction industry needs to change its practices**. Every year, around 650 million cubic meters of water are extracted from the Dead Sea and led into large evaporation basins. Instead, the valuable minerals could also be filtered from the salt water by using special membranes. This, however, is an expensive technology and as the mineral extraction industry does not yet pay for the water that it extracts from the Dead Sea, the governments need to create incentives first.

Both Israel and Jordan are able to provide large quantities of fresh water for the Lower Jordan River. In doing so, Palestinian water rights would be respected, which can be seen as an important step to foster the peace process in the Middle East.

Outlook

It is **not yet clear whether the Red-Dead Canal will be built or not**. This is due to the very high costs associated with the construction. According to the World Bank, the feasibility of the project depends on the ability to raise 4 billion U.S. dollars in donations and grant aid. Taking the current world economic crisis into account, this will rather be difficult. In addition, Israel is deeply in debt and Jordan is close to bankruptcy. Thus, the project does not seem to be financially feasible at the moment.

Together with Friends of the Earth Middle East (FoEME), Global Nature Fund advocates the [rehabilitation of the Lower Jordan River](#). Since 2012, GNF is involved in the development of the first ever [transboundary integrated NGO master plan for the Lower Jordan River](#). This project lays the groundwork for effective transboundary water governance in the Lower Jordan River Basin. Due to the tense political situation in the region, many people regard the rehabilitation of the Lower Jordan River as a hopeless endeavour. But there is hope. Israel recovers more than 80% of its water and realises plans to desalinate 600 million cubic meters of water from the Mediterranean Sea. In Jordan and Palestine sewage treatment plants are constructed. While the region was threatened by severe water shortages 10-15 years ago, FoEME already came a little bit closer to their goal to pump 400-600 million cubic meters of water into the Lower Jordan River. In May 2013, Israel's Water Authority declared that they will regularly release water from Lake Kinneret. This year, around 6 million cubic meters will flow into the river and the plan is to increase the inflow to 30 million cubic meters per year. Even though this amount of water is not enough to replenish a river of the size like the Jordan, it is a promising start. And once the Jordan River flows again, a first step for saving the Dead Sea is done.

Red Sea – Dead Sea Canal and the Feasibility Study of the World Bank



Resources:

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