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Palestine Economic Policy Research Institute

**Final Report
Round Table Discussion (3)**

**The Red Sea-Dead Sea Water Conveyer:
The Project, the Assessments and Potential Benefits to
the Palestinian Territory**

March 2013

Executive Summary

The Red Sea-Dead Sea Conveyer: The Project, Rationale, Assessment and Potential Benefits to the Palestinian Territory

Date: March 26, 2013

Introduction

This session aims to scrutinize and evaluate the World Bank's reports on *The Red Sea-Dead Sea Water Conveyer Project*. It also seeks to find out whether the Palestinian party plays its role on an equal footing with the other target parties; and to analyze the potential gains and opportunities of capitalizing on these gains in the Palestinian Territory.

Presenters:

Dr. Numan Kanafani: Director of Research, MAS

Dr. Jad Isaac: Director General in the Applied Research Institute - Jerusalem – ARIJ

Dr. Shaddad Attili: Head of the Palestinian Water Authority

Key Discussion Questions

- ✧ How to read the World Bank's preliminary studies on the project? Were they comprehensive? Did they give satisfactory answers? Did the World Bank conduct objective assessments?
- ✧ Does the Palestinian side play its role on an equal footing with the other target sides? In other words, does the Palestinian side still have the opportunities to call the shots?
- ✧ What are the Palestinian potential gains from the project, and the odds of materializing these gains?

Summary of the presentations of the keynote speakers

Dr. Numan Kanafani opened up the meeting by presenting an overview of the MAS background paper (see Appendix). He said that the main objective of the project, according to the WB studies, is to save the Dead Sea from environmental degradation. It is estimated that the Dead Sea is shrinking at an annual rate of 1 cubic meter, down from 394 meters below sea level in the 1960s to 423 meters below sea level in 2012, reducing the total area of the Sea by about one third. The main stated reason behind this decline in the sea level is the decline in the water flowing from the Jordan River as a result of upstream diversion – mainly by Israel and Jordan (about 90% of the water in the River), as well as the exploitation of the River water by these two countries. This has occasioned enormous economic losses, particularly in the tourism sector (the net present cost of the ongoing decline in international tourist visitors to the Dead Sea area over the next 50 years has been evaluated by the World Bank to be \$2.7 billion). Further, the ongoing decline of shorelines has compounded the losses in the agricultural sector and the extractive industries. Dr. Kanafani continued to say that artificial sinkholes continue to damage the infrastructure of the Dead Sea Basin. Besides, there are remarkable water shortages in the region. In Jordan, for example, in 2008 the demand for water was about 1.5 billion m³, while resources available could provide only 778 million m³. It is estimated that the demand will double by 2025. It is also expected that the population in the three countries will reach 30 million by 2050, augmenting the demand for water.

Kanafani went on to say that many solutions have been proposed, with two standpoints particularly having direct bearing on the issue. The first says that the only way out of the problem is to transfer water to the Dead Sea from the Red Sea or the Mediterranean (which will also allow constructing power-producing facilities and water desalination). The opponents of this project (environmental groups or political opponents) say the project will not solve the problem. Rather, they argue, it will yield devastating environmental effects. They, however, propose an alternative solution: a restoration of the Jordan River to its natural flow.

Kanafani remarked that the project has a political significance. Building the peace between Arabs and Israel, he said, is not a new idea: back in the early 1950s, there was the Johnston proposal which sought to exploit the tributaries of the Jordan River. Some leaks suggest that the Jordanian and Israeli sides have already started the project without notifying the Palestinian side, that insisted from the beginning to engage in the project given its political significance regarding the Palestinian rights to the water resources. Of course, Israel has always tried to eliminate the role of the Palestinian side.

According to planners, a large water station will be constructed to pump water from the Gulf of Aqaba. This station will annually pump 1.9 billion m³ of water from the Red Sea at a nominal elevation of +220 m, and pour the pumped water in the canal leading to the Dead Sea. The head difference between the Red Sea and the Dead Sea provides the potential to generate hydropower used to desalinate sea water. Kanafani pointed out that half of the water pumped from the Red Sea will be subject to desalination, and the other half will be pumped directly into the Dead Sea.

In 2005, the three beneficiary parties announced their agreement and commitment to study the feasibility of transferring water from the Red Sea to the Dead Sea. The World Bank, in turn, hired experts from the target countries and international experts, and it established a multi-donor trust fund of eight countries. The cost of the five preliminary studies totaled about \$16 million. These studies summarized the three main objectives of the project: to save the Dead Sea from environmental degradation, desalinate water and generate electricity, and create a symbol of peace in the region. MAS prepared a summary of three studies of the WB: the feasibility study, the alternatives study, and assessment of the environmental and social impact.

The feasibility study tested 3 scenarios. The first is the 'No-Project, leaving the current situation intact. In this case, the region will incur massive economic losses estimated at about \$ 2.9 billion, and the shrinking of the Dead Sea to -550 m below sea level over the next 150 years. In the second scenario, only the first objective of the project (saving the sea) has been tested (without considering generating power or distilling water). In this case, the project will raise the water level to -428 m. This requires the pumping of 1.2 billion m³ of water annually. The third scenario (which involves all the objectives of the project) requires annual pumping of 1.9 billion m³ of water, and will secure a stable level of -416, and provide 850 million m³ of fresh water. The costs of the project, accordingly, will total \$10 billion (excluding the cost of transferring water to Palestine and Israel), and the domestic revenue will grow by 21.5% compared with the second scenario. In the latter scenario, 350 million m³ of water will be produced, and this figure will rise to 850 million m³ in 2060. The studies corroborated that the water needs in Jordan were estimated based on serious studies by the Jordanian party, while the Palestinian and Israeli parties were not as serious as the Jordanian party. Therefore, the Palestinian side provided an arbitrary figure of needs (only 60 million m³)!

The second study examined potential alternatives to the Red Sea- Dead Sea Canal. The alternatives proposed involved 21 proposals, including the transfer of water from Turkey, the conveyance of water from the Mediterranean Sea to the Sea of Galilee (Lake Tiberias), the transfer of water from the Mediterranean Sea to the Jordan River, recovering the historical tributaries of the Jordan River. Five criteria were invoked in the analysis of these alternatives: the stability of the Dead Sea, producing safe drinking water, promoting Arab-Israeli cooperation, environmental and social impacts, and the costs of the project (See summary of the study of alternatives in the background paper). The study found that there are only two alternatives that can achieve the five goals: the transfer of water from the Mediterranean Sea to the Dead, and a conduit from the Red Sea to the Dead Sea. Strikingly, the economic costs of desalination, transferring water and the implementation of the Mediterranean- Dead Sea project were less than the costs of the Red Sea-Dead Sea project.

The third study, environmental and social assessment, found that there are 8 elements associated with serious risks (see Summary of the environmental and social impacts study). The study suggested measures to mitigate the detrimental environmental impacts. In general, if the

environmental management plan is appropriately carried out and monitored, the project can be implemented without any environmental or social negative impacts, thus preliminarily realizing the desired key objectives of the project. Doubts, however, remain reasonable, Kanafani remarked.

Dr. Jad Isaac

Dr. Isaac started his presentation with underscoring that the decline in the level of the Dead Sea is a result of exploiting the water of the Jordan River by Israel. The Dead Sea had never shrunk before the establishment of Israel, he noted. He held Israel accountable for the Dead Sea basin environmental degradation. Then he proceeded with a historical overview of the problem. The idea of the project, he said, was proposed in 1850 by William Allan in his book *The Dead Sea: a new route to India.*, yet it has never been materialized. Later, in 1899, Max Borart raised the idea of conveying water from the Red Sea to the Dead Sea before Theodor Herzl, who adopted it and mentioned it in his 1902 book *Old-New Land*. In 1926, the British High Commissioner granted the Jewish owned Palestine Electricity Corporation, founded by Rotenberg, a 70 year concession to utilize the Jordan water for generating electricity. The water and the land holding this water (involving the Hula Lake, part of the water of Wadi Araba and part of Alfashaka area) was annexed to the 6% of the Palestinian land already possessed by the company, bringing the percentage to 7%.

In 1938, Lautenberg submitted a draft to the Jewish Agency proposing the transfer of water from the Mediterranean Sea to the Dead Sea. In the 1940s, this proposal was raised before the World Zionist Organization by several people. After the establishment of the state of Israel, the United States prepared the Johnston Plan, which, according to Isaac, sought to utilize the irrigable land. Several projects were implemented in accordance, most notably the National Water Carrier Project and the East Ghor Canal. The West Ghor Canal is the only one that has not yet been implemented. In the mid-eighties, the transfer of water to the Dead Sea (particularly via the Red/Dead Conduit) was proposed in several economic conferences, but it was declined. The proposal surfaced again in a workshop on water at the Cairo Conference in the early 1990s. The workshop concluded with recommendations to study the proposal and the potential mechanisms. In 1996, a meeting in Jordan brought together Water Working Group and Environmental Working Group. The two groups denied the inclusion of the project by the Palestinian side, saying the project would be fraught with risks. After concluding the Wadi Araba Agreement, the proposal was revived, but Israel adamantly objected to the participation of Palestine. After many meetings, the Palestinian side was recognized as a Dead Sea riparian party (i.e., having the same rights and benefits enjoyed by the Jordanian and Israeli parties). A memorandum of understanding was concluded by the three parties. Work on preliminary studies started in collaboration with the World Bank.

Dr. Isaac pointed out that in 2010, the Palestinian estimated occupation-driven losses stood at \$7.4 billion, including the significant losses in the Palestinian tourism sector incurs (as Palestinians are denied access to the Dead Sea, where they can exploit the shores of the Dead Sea to build resorts) as well as the losses in mineral and extractive industries (estimated at \$1.7 billion) on the assumption that Palestine is a coastal party and, thus, it is entitled to building resorts and exploiting the Dead Sea minerals.

According to Dr. Isaac, the project is essentially political, and that the issues of tourism, water desalination and energy production are only a red herring. He believes that Israel's goal is to save the Dead Sea from sinkholes and revive medical tourism. He advocated alternative proposals, such as the Turkish Plan which has been adopted by the Turkish Ministry of Water, which also pledged to seek full funding from several countries, while Palestine only pays the cost of transferring water. The second proposal, that Isaac supported, is the Mediterranean-Dead Sea (Med-Dead) waterway via a bridge that links the West Bank and Gaza. This bridge could be used to run cars and transfer water, apart from the benefits of linking the West Bank and Gaza Strip.

Isaac concluded that the Palestinian approval to engage in the project should be contingent on the achievement of five demands, namely:

- ✧ Israel must okay the establishment of 'Palestine for the Dead Sea Salts Company'.
- ✧ The construction of 10 tourist hotels in the region.
- ✧ Recognizing and giving back the Palestinian water rights.
- ✧ Revoking the military orders that confiscated the Jordan River and its water sources.
- ✧ Conveying the ownership of the Fashaka Natural Reserve and the Galia Resort to the Palestinian side.

Isaac recommended that if Israel does not acquiesce to these conditions, the Palestinian and the Jordanian parties should proceed to implement the Turkish project.

Dr. Shaddad Attili

Dr. Attili first clarified the official view (on behalf of the Palestinian Authority and the Steering Committee) of the subject in question. He said that the official position is not very much different from what was previously reported by Dr. Kanafani and Dr. Isaac. "I wish we could come up with one consolidated Palestinian standpoint," he said. Dr. Attili did not negate the negative effects associated with the implementation of the project, and made some clarifications on the technical aspects. The project must first undergo a pilot phase in which the implications of mixing the water of the two seas is thoroughly examined. It is probably convenient that we wait until the Palestinian side agrees on the implementation of the pilot phase, but part of the project (namely that in Alfashaka) should be soon implemented, such that water is transferred from Lake Tiberias via the King Abdullah Canal. The Palestinian side will, in turn, convey and distribute the transferred water. Of course, the Israeli side declined these demands, thus hampering the implementation of the project.

Dr. Attili believes that the local community must have something to say about this project, because the observations given to the steering committee that oversees the project enrich the work of the committee and help in strengthening the position of the Palestinian side in the negotiations with the various parties.

The talk about setting up a channel between the Red Sea and the Dead Sea via Wadi Araba is not new (as Dr. Isaac noted before). The goal of such a project is to provide safe drinking water for human use, Dr. Attili reiterated. He continued to say that, before the founding of the state of Israel, Herzl considered the canal a strategic project that would provide water resources for the state he planned to create. Certainly, Israel will take part in this project in order to achieve the greatest possible gains.

Dr. Attili pointed out that the Palestinian goals from the project are vague, and the project does not explicitly recognize the Palestinian rights. Arguably, the Palestinian party has been incorporated only to evoke international finance. However, the Palestinian delegation was adamant on fulfilling the Palestinian rights, and it did not agree on any item related to the project without prior evidence that the Palestinian side is equal to the other parties in the gains that can be achieved from the implementation of the project. One output that should have been engendered before conducting the studies is a joint statement by the Israelis and Palestinians on managing the Dead Sea basin, Dr. Attili said.

Attili continued to say that in line with the best alternative to a negotiated agreement, the expected outcomes of the project should be identified in advance. Because Jordan is a major beneficiary of the project in the Wadi Araba, the project will create new jobs for the Jordanians and it will significantly help in boosting the economic growth. On the Palestinian side, however, the Palestinian Authority would have to justify the increase in water prices under no tangible growth in the Palestinian economy.

Dr. Attili finally urged attendees to give their feedback and constructive criticism to support the efforts of the Palestinian official agencies in drafting a joint written standpoint showing the Palestinian reservations. In this regard, official bodies should liaise with the local community institutions, he advised.

Summary of discussion

Aql Abu Qare'

I thought that today's workshop would help us come up with adequate answers to the questions raised in the beginning of the session (particularly the aspects of 1. Water: What is our share of water? 2. Environment: positive or negative impacts. 3. The economy: impact on tourism and mineral industries. 4. civilization and culture). The studies are already there, but they have not been analyzed critically so as to answer the questions related to these aspects. As it is a strategic project, I suggest holding workshops to help answer these questions convincingly. I have only two questions. "Dr. Attili, is there a clear Palestinian position of the project? If yes, what is it? Dr. Isaac, what is exactly the negative environmental impact of the project?"

Dr. Fathi Srouji - Assistant Professor, Birzeit University

MAS prepared a study for the Ministry of Agriculture to identify the comparative advantage of growing some crops in Palestine. We found that in the Jordan Valley region, in particular, there is a comparative advantage for the production of all crops. Tomatoes, for example, have a comparative advantage (cost of local resources) of 13%. In addition, a sensitivity analysis has been made (assuming that the price of water will increase 3 times), and the tomato crop still has a comparative advantage of 79%. According to the World Bank figures, the price of a glass of water will increase 5-8 times. When sensitivity is reanalyzed, the result will be more than 100%; i.e. there will be no comparative advantage, and growing tomatoes will be useless.

Abdul-Rahman Al-Tamimi – The Palestinian Hydrology Group

I think the problem is in the way Palestinians deal with the projects presented to them. The Israelis are no longer considering this project as much as the Palestinians are. It is no more one of their national priorities. Israel announced at the end of 2012 that it succeeded in putting back the water crisis up until 2030. Israel has already built 3 desalination plants, while another 3 are still under construction, and another 4 are still in the planning stage. Obviously then, the project is 100% political from the Israeli point of view. The Palestinian party should, in response, determine its national priorities and behave accordingly.

I believe that the project should not be part of our national water strategy, because it is based on assumptions, and, thus, it might come to naught, let alone the problems it might bring about if it is deemed to be implemented. For example, it is unreasonable that we desalinate water at an elevation of 400 meters below sea level and transfer it to Halhoul at an altitude of 1200 meters above sea level. This is very expensive and it is economically unviable.

The second point I wanted to raise is that this project is part of the economic normalization in the region, and thus it was approved after being declined before. Now, we must talk about how the Palestinian state will secure water sources in order to be a viable state.

Saleh Rabi - The Palestinian Hydrology Group

The project is political in nature. Peace and economic cooperation in the region is political in every sense of the word, and the Palestinian side is being overlooked. The map shows that the project will be set up in the Jordanian territory, focusing on the water needs of Israel and Jordan, but not the Palestinian needs, to the extent that our need of water was introduced arbitrarily (60 million m³).

Afeef Eseid - Ministry of Public Works and Housing

This project is primarily feasible for Jordan; Israel comes in the second place. Because, according to data presented, there are significant losses, mostly in the tourism sector; its implications for Israel are tourist in the first place. We, as Palestinians, need to define our priorities of the project. What are the gains that we want to achieve? Do we endorse the project if Israel accepts our conditions (water sources of Alfashaka and north of Ein Gedi)?

The second point: The Palestinian side is considering the issue disproportionately. The truth is that we are not major beneficiaries of the project. We must look for other more durable, feasible sources of water.

Clemens Messerschmid - Rosa Luxemburg

I do not understand why, up to now, there is no clear Palestinian position on the project. I am personally against the project, mainly because of the stated goals (saving the Dead Sea, water distribution and creating a symbol of peace) and the unstated main goal: the ongoing theft of the Dead Sea water by Israel. Saving the Dead Sea and its environment is a good thing, but it not a priority when more than 1 million Palestinians live on less than 60 liters per person per day.

The World Bank focuses on the Israeli and Jordanian interests of the project. In the 2,500 pages of the unpublished reports, there is no single page (even not a single reference) on the Palestinian interest. The study is essentially racist.

There must be a clear Palestinian position: rejecting the project and its goals. Later, we should look for alternatives and the best alternative to a negotiated agreement, considering the costs and the technical details. I think that the most important thing is the future state of the Palestinian water in the eastern mountain basin. More important is to recognizing the Palestinian water rights in the eastern basin, where the Palestinian portion is being drained and robbed. I do not understand why the PA does not do anything to stop this.

Answers to the questions raised by the public

Dr. Attili answering a question raised by Mr. Aql Abu Qare':

We have had negotiations for more than 10 years, but we have set and maintained the red lines regarding the Palestinian claims of water rights. The figure '60 million m³' does not stand for the Palestinian demands of water. The figures have been made available before the world Bank advisors only to facilitate calculations (and this is tallied in the reports). When the Israelis decided to take part in the project, their goal was to have access to consultancy through the already-made studies and research. All the data obtained by the Hydrological Service of Israel will be made available to the Palestinian party. The Israeli side has now rejected the project (for environmental reasons). We are here today to come up with a conspicuous position.

Dr. Isaac answering a question raised by Mr. Aql Abu Qare':

The Dead Sea water is salty and dense. When its water mingles with semi fresh water, fish will find it a good place to live and breed; Sulfonate starts to float, and a layer of gypsum will start to build up as a result of the difference in density. In short, the character and the heritage of the Dead Sea will be abolished, and it will be very much like the Red Sea.

Recommendations

- ✧ The Palestinian side must develop alternatives to the project, and create sustainable, safe sources of water under Palestinian or international sovereignty.
- ✧ It is incumbent on the Palestinian delegation to assume its role in the bodies of this project despite the high probability that the project will not pay off. The Palestinian presence is necessary to emphasize the water and coastal rights. The Palestinian position must be reinforced by documented studies and tailor-made alternatives. Further, the issue must be liaised with the Jordanian side and with other Arab countries directly affected.
- ✧ The Palestinian side must set national priorities (BATNA) as a first step to shore up the Palestinian position and achieve some of the demands when negotiating with the Israeli side.

Background Paper

Red Sea – Dead Sea Water Conveyer Project:

The Project, the Assessments and Potential Benefits to the Palestinian Territory

Red Sea – Dead Sea Water Conveyer Project: Background

The Red Sea- Dead Sea Conduit is a project for the construction of a 180 kilometer tunnel (and pipeline within) running from the Gulf of Aqaba on the Red Sea in the south to the Dead Sea in the north. It is a joint venture between Jordan, Palestine and Israel. The project mainly seeks to stop environmental degradation in the Dead Sea, provide the beneficiaries with fresh water, and produce hydroelectric power needed to operate the pumping stations and water desalination. The planners see the project as a symbol of peace between Arab states and Israel. The project will require \$11 billion in capital. The parties are looking forward to raising capital from international donation and from the three beneficiary countries¹.

Environmental degradation of the Dead Sea

The Dead Sea is shrinking at an annual rate of 1 cubic meter, down from 394 meters below sea level in the 1960s to 423 meters below sea level in 2012, reducing the total area of the Sea by about one third (from 950 square kilometers to 637 square kilometers)². The main reason behind this decline in the environment of the Dead Sea is attributed to the dramatic shrinkage in the flow of the water of the Jordan River, which is, in turn, engendered by the exploitation of the water of the river and its tributaries by the Israelis, Jordanians and Syrians. Jordan has rerouted a number of the headwaters of the river to the Jordanian cities experiencing a shortage in drinking water, since statistics indicate that Jordan is one of the world's ten poorest countries in terms of per capita share of water. Israel, in turn, has diverted a number of the river's tributaries to grow some exotic crops that need large amounts of water. Israel has also rerouted a number of naturally flowing valleys (in which the rain water pours before flowing into the sea) to the Jewish settlements in the West Bank. The total mass of water held back constitutes 90% of the Dead Sea's resources³. What's more, the water of the Dead Sea is being drained by the Israeli and Jordanian factories built on its shores.

Economic losses

The environmental degradation has occasioned significant economic losses, particularly the significant decline in the tourism sector. Thanks to its feature of being the lowest point on earth – together with its therapeutic water- the Dead Sea had for long been a distinctive tourist destination. Statistics demonstrate that the net present cost of the ongoing decline in international tourist visitors to the Dead Sea area over the next 50 years has been evaluated to be \$ 2.7 billion⁴, let alone the losses the factories incur (due to the decline in sea shores) and the enormous negative effects on the agricultural sector in the areas of the Jordan Valley as a result of the decline in groundwater levels in the Dead Sea area. Worse is the damage the infrastructure of the region has inflicted, particularly the resulting 3 thousand sinkholes around the area⁵. Sinkholes appear suddenly without warning and have destroyed buildings, roads and agricultural lands. Experts say their concurrence would likely cease over a period of about 10 if the water level is stabilized⁶.

¹ Palestine Economic Policy Research Institute (MAS). Economic and Social monitor, Issue 18.

² World Bank (2013): Red sea- Dead Sea Water Conveyance Study Program, Overview- Updated January 2013.
http://siteresources.worldbank.org/EXTREDESEADEADSEA/Resources/Overview_RDS_Jan_2013.pdf?&&resourceurlname=Overview_RDS_Jan_2013.pdf

³ Our environment: Who destroyed the Dead Sea?

http://www.beatona.net/CMS/index.php?option=com_content&view=article&id=159&Itemid=84&menuid=&lang=ar

⁴ World Bank (July 2012): Red Sea - Dead Sea water conveyance study program feasibility study

http://siteresources.worldbank.org/INTREDESEADEADSEA/Resources/Feasibility_Study_Report_Summary_AR.pdf

⁵ MA'AN Development Center (2010): Electronic Magazine: Environmental Monitor, Issue 28

<http://www.maan-ctr.org/magazine/Archive/Issue28/Alrased.php>

⁶ World Bank (July 2012): Red Sea - Dead Sea water conveyance study program feasibility study

http://siteresources.worldbank.org/INTREDESEADEADSEA/Resources/Feasibility_Study_Report_Summary_AR.pdf

Water Shortage

The region is at disadvantage in terms of the dearth of water resources, which makes it imperative for the three parties to search for new sources to meet the needs of the growing demand for water; especially in light of the widening gap between available resources and the needs of population growth. In Jordan, for example, in 2008 the demand for water was about 1.526 billion m³, while resources available could provide only 778 million m³ (i.e. the demand is nearly twice that available). Currently, the underground water basins in the three countries provide only around 2.6 billion m³ a year (1.7 billion m³ / year for Israel and Palestine, and 933 million m³ / year for Jordan)⁷. It is estimated that the demand will be 1.7 billion m³ by 2025⁸. The population in the three countries is 19 million, and it is expected to grow to 30 million by 2050.

Different Perspectives

Proponents of the Red-Dead project see in it the best way to address environmental challenges in the Dead Sea area; provide the region with fresh water; create new jobs; and help in turning large areas of the desert to populated, tourist destinations. Above all, the project will promote the Arab - Israeli cooperation and enhance the opportunities for peace. On the other hand, the opponents of the project believe that it could induce adverse effects on the environment, and that the project does not provide practical solutions to the problem of the shortage of drinking water. They also argue that the envisioned scope of the project's political role is exaggerated. The emphasis on the political dimension, they believe, is only a pretext to ensure international financing. Accordingly, they propose an alternative solution: a restoration of the Jordan River to its natural flow, reducing the exploitation of the water for industrial purposes, and rationalizing the water consumption.

The opponents harp on the potential adversary environmental effects, including the damage to the natural unique system of the Dead Sea, and the waters admixture (which is a propitious ambience for the emergence of algae and calcareous sediments), - which eventually changes the color of water. In addition, groundwater in the Wadi Araba could be contaminated if a pipeline is damaged, which is quite possible in an area of frequent earthquake activity⁹.

The Proposed Conduit

The project involves setting up the largest pumping station in the world between Aqaba and Eilat, as well as a desalination plant in the farthest southern side of the Dead Sea. This station will annually pump 1.9 billion m³ of water from the Red Sea at a nominal elevation of 220 m, and pour the pumped water in the canal leading to the Dead Sea. The head difference between the Red Sea and the Dead Sea provides the potential to generate hydropower used to desalinate sea water. Half of the water pumped from the Red Sea will be subject to desalination, and the other half will be pumped directly into the Dead Sea.

The political dimension

Although the project is supposed to be a joint venture between three equal partners, the repeated statements of Israel often sought to keep the Palestinians out. The Palestinian Authority, in turn, is so eager to be an equal party to the project. In an interview with Palestine Media Center, Mr. Fadel Ka'wash, the former head of the Palestinian Water Authority, said that the Palestinian participation in the project aims to emphasize the international legitimacy. It is not only about economic gains, holding to the Palestinian rights in the joint water resources is also indicative¹⁰.

Building peace between Arabs and Israel is not a new idea. There had been several proposals designed to strengthen the Arab - Israeli cooperation through the development and distribution of

⁷ Water Authority of Jordan (2008). Privatization of the water sector.

⁸ World Bank (2012): Red Sea - Dead Sea water conveyance study program: The alternatives study.

http://siteresources.worldbank.org/INTREDESEADEADSEA/Resources/Feasibility_Study_Report_Summary_AR.pdf

⁹ Spiegel Online (2009): 'Israel-Jordan project Aims to Save Dead Sea
<http://www.spiegel.de/international/world/0,1518,503953,00.html>

See also MAS (2008): the Economic and Social Monitor, Issue 18.

¹⁰ Palestine Media Center (2005): 'The Red Sea - Dead Sea Canal Project and the Palestinian Gains
<http://www.palestine-pmc.com/details.asp?cat=3&id=620>

scarce water resources. Back in the mid 1950s, there was the American scheme 'Johnston' which was intended to divide the water of the Jordan River and Yarmouk River between Syria, Lebanon, Jordan and Israel. According to studies conducted at the time, the annual amount of water that could have been transferred was estimated at about 284 million m³, and the amount of electricity that could have been produced was estimated at 218 million kilowatt / hour. The cost of the project was projected at \$121 million (prices of 1953). However, Syria and Lebanon rejected the project because, according to them, it would have meant an implicit recognition of the state of Israel. The efforts of this proposal were entirely thwarted after the 1967 war and Israel's seizure of the Golan Heights¹¹.

Recourse to the World Bank

In May 2005, the three beneficiary parties dispatched a letter to the World Bank asking it to conduct preliminary studies for this huge project and coordinate donor funding. Seeing that the proposed project has developmental dimensions, the World Bank agreed to conduct these studies.

2. The World Bank studies

The World Bank set up a multi-donor trust fund of eight countries (France, Greece, Italy, Japan, South Korea, the Netherlands, Sweden, and the United States) to finance the preliminary studies. Further, a technical team (of 4 representatives from each of the three parties in addition to representatives from the World Bank) was formed to oversee the completion of the studies. World renown experts were assigned the task of conducting the studies. They concluded with three major goals:

1. Saving the Dead Sea from environmental degradation.
2. Desalinating water and / or generating hydroelectric power for the benefit of Jordan, Israel and Palestine.
3. Creating a symbol of peace in the Middle East.

The studies took more than 5 years to be completed, at a cost of approximately US\$16 million. In the past few months, the World Bank published the results of the five studies on the Red-Dead Project:

- ❖ Feasibility study
- ❖ Possible alternatives
- ❖ Assessment of the environmental and social impact of the project
- ❖ The potential physical, chemical and environmental impact on the natural system of the Red Sea.
- ❖ The potential physical, chemical and environmental impact on the natural system of the dead Sea.

Below, we summarize and present the results of the first three studies.

2.1 The Feasibility Study¹²

The final draft report of the feasibility study tests three scenarios:

No-project Scenario

This scenario assumes taking no action. The Dead Sea will continue to decline at a steady rate and will reach a new equilibrium at somewhere around -550 m over the next 150 years. This is coupled with high costs and a net loss worth of \$2,885 million (see Table 1). As the Table shows, the tourism sector will bear the bulk of the loss, while loss in the chemical industry comes in the

¹¹ <http://iba.org.il/arabi/arabic.aspx?classto=InnerKlali&type=5&entity=823563&topic=0> ; <http://www.al-hakawati.net/arabic/civilizations/raedindexb7.asp>

¹² World Bank (July 2012): Red Sea - Dead Sea water conveyance study program: feasibility study
http://siteresources.worldbank.org/INTREDEADEADSEA/Resources/Feasibility_Study_Report_Summary_AR.pdf

second place. The Israeli and Jordanian factories on the shores of the Dead Sea consume nearly 262 million cubic meters per year of sea water in mining potash, magnesium, manganese, and bromine¹³. The ongoing drop in the amount of water that can be taken from the Dead Sea, the decline in the shores and the exposure of the seabed will force the factories to periodically relocate extraction plants in order to catch up with the water level in the declining areas. This will increase costs by about \$164 million. The environmental, social and infrastructure damages will be estimated at about \$ 85 million¹⁴ (see Table 1).

Base Case Scenario

The objective of this scenario is only to preserve the waters of the Dead Sea. The focus is on raising the Dead Sea water level in order to ensure a stable elevation of 434-428 below sea level, while overlooking the other goals of the project (to provide drinking water for the region and / or generate hydroelectric power and build a symbol of peace). In this scenario, the Dead Sea water level will be 434 meters below the sea level at the start of the implementation of the project. Although the sea forfeits an annual volume of 708 million cubic meters (through pumping), to maintain a level of 434-428 (below sea level) requires pumping about 1,200 million cubic meters of the waters of the Red Sea annually. This is probably a result of the different natures of the two seas, since the water of the Red Sea might work to reduce salinity in the surface water of the Dead Sea, and thus increase the likelihood of evaporation. At the economic level, the feasibility study found that this scenario is the cheapest, as the head difference between the Red Sea and the Dead Sea allows a gravity flow of water. A cost estimate for the Base Case suggests a capital cost in the order of \$4.3 billion and a whole lifecycle net present cost of about \$ 6.2 billion.

Table 1: Summary of the economic costs and benefits. Total Net present value (2020)¹⁵

Benefits	No Project Scenario	Base Case Plus Scenario	
		\$ millions	%
Tourism	- 2,635.7	3,475.0	%6.15
Chemical industries	- 164.2	247.9	%1.40
Power generation	...	1,400.8	%18.29
Water supply	...	10,331.2	%18.29
Intangible advantages	...	41,644.4	%73.71
Infrastructure	-85.3	7.8	%0.01
Total value of benefits	-2,855.3	56,499.0	%100
Costs	0	17,337.0	
Benefits- Costs	- 2,855.3	39,730.1	
Internal Rate of Return			%21.68

Note: In this table, the costs refer to the current total net costs (i.e. the total capital costs and the operating costs deducted over a period of 50 years after the commencement of the project).

Base Case plus Scenario

This scenario fulfills all the conceptualized objectives of the project (saving the Dead Sea, hydroelectric power generation and water desalination, and building a symbol of peace). This model assumes two Red Sea water abstraction and transfer flow rates of 1,800, and 2,000 million m³ / year together with 850 million m³ as potable water demands. The study tested several

¹³ World Bank (September, 2012): Red Sea - Dead Sea water conveyance study program: The alternatives study. http://siteresources.worldbank.org/INTREDESEADSEA/Resources/Study_of_Alternatives_Summary_AR.pdf

¹⁴ The estimates of the losses in the tourism sector and the metal and chemical industries sector, as well as the environmental and social damage were calculated for the next fifty years at a 10% discount rate.

¹⁵ World Bank (July 2012): Red Sea - Dead Sea water conveyance study program: feasibility study http://siteresources.worldbank.org/INTREDESEADSEA/Resources/Feasibility_Study_Report_Summary_AR.pdf

alternatives and concluded that transferring water through a pipeline, together with a high level desalination plant, is the best solution recommended. A riser is supposed to be built to the south of the Gulf of Aqaba. The station is connected to a 25.5 km tunnel that runs around the town of Aqaba to transfer water. From the upstream portal of the tunnel to the Gharandal saddle (in Wadi Araba), the riser will comprise a series of buried pipelines that are 66.5 km long. Another 50 kilometer-long pipeline carries gravity flow water from Gharandal saddle to a plant producing hydroelectric power, and a high elevation desalination plant. At that point, two pipelines will be set up. The first (32 km long) connects the desalination plant and the second hydroelectric power production plant and continues to carry salt water to the northern part of the Dead Sea. The second starts from the desalination plant and conveys potable water to Amman.

The feasibility study concluded that the project has significant positive economic benefits (about \$ 42 billion compared with the "No Project" Case), in addition to a high internal rate of revenue: 21.68% (see Table 1). The Base Case Plus Scenario needs \$ 10.6 billion to be completed (Table 2 shows the distribution of the total cost). This amount, however, does not include the costs of establishing the freshwater pipeline to Israel and the Palestinian territories. Through the desalination plant, the project is expected to yield 350 million m³ of water by 2020, and 850 million m³ by 2060, as well as 1,642 GW / hour of electric power by 2060. Above all, the project will bring stability to the Dead Sea, at 416 meters below sea level by 2054.

Table 2: Full Cost of the Pipeline with High Level Desalination Plant Configuration¹⁶

Cost items	Cost (\$ millions)
Intake works	23.00
Pumping station	230.94
Main water conveyance (tunnel and steel pipes)	4,689.98
Desalination facilities	2,436.85
Hydropower plants	241.38
Restitution canal	266.93
Connection to the transmission grid	265.56
Project management	244.64
Institutional structure	7.8
Sub-total	8,407.09
Sub-total of water transmission line to Amman	2,211.60
Total	10,618.69

Table 3 shows the expected supply of fresh water. The study highlights that Jordan's share is based on studies to estimate the water deficit in that country, while the figures for Israel and the Palestinian territory are hypothetical, and came as a result of an initial simplified assessment. In the Palestinian territory, making predictions on supply and demand is not easily feasible. In Israel, the figures are only an estimate of the shortage of supply in the low-elevation areas.

¹⁶ World Bank (July 2012): Red Sea - Dead Sea water conveyance study program: feasibility study
http://siteresources.worldbank.org/INTREDEADSEA/Resources/Feasibility_Study_Report_Summary_AR.pdf

Table 3: Potable Water Demands Approved by the Technical Steering Committee

Beneficiary party	Potable Water Supplied from the Project - Million m ³ /year				
	2020	2030	2040	2050	2060
Jordan	230	310	370	460	560
Israel	60	60	60	60	60
PA	60	60	60	60	60
Available for Further Allocation	0	0	50	90	170
Total	350	430	540	670	850

Source: World Bank, feasibility study, 2012.

Production and transport costs of desalinated water, according to the feasibility study, are presented in Table 4.

The feasibility study found that although most expenses of the project during the construction phase will be spent outside the region (on purchasing the station's equipment and raw materials and recruiting international contractors), a large proportion of the construction costs will be spent within the region. Given that most of the construction work will take place in Jordan, Jordan will be the main beneficiary in this aspect. It is expected that Jordan's economy will see an additional growth of 10% when the project is ready to run.

Table 4: Estimates of the costs of production and transportation of potable water (\$ / Cubic meter)

	Jordan	Israel and the OPT
The cost of production (per cubic meter)	\$ 1.5 – 1	\$ 1.5 – 1
Transmission cost	\$ 1.2 – 0.7	\$ 0.35 – 0.20
Total	\$ 2.7 – 1.7	\$ 1.85 – 1.2

2.2 The Alternatives Study¹⁷

This study tested about 20 alternatives of the Red-Dead Project according to five criteria:

- ✧ Achieving stability in the Dead Sea or reviving it.
- ✧ Making available a new source of drinking water to be shared in the region.
- ✧ Enhancing cooperation between beneficiary parties.
- ✧ Construction and operating costs.
- ✧ Potential environmental and social impacts.

Examined alternatives cover a large number of varying projects, ranging from restituting water sources that were flowing into the Jordan River, to desalinating and conveying water from the Mediterranean to the Jordan River or directly to the Dead Sea, to transferring water from Turkey and from the Euphrates River.

The study sought to examine and evaluate the positive and negative sides of each alternative, and determine the cost and extent of its capacity to achieve the above objectives with relation to the main project (Red Sea - Dead Sea).

The study concluded that the 'No-Project' alternative would result in an annual loss of \$73-207 million at the economic, environmental and social levels. The 'No-Project' alternative will drive

¹⁷ World Bank (September, 2012): Red Sea - Dead Sea water conveyance study program: The alternatives study. http://siteresources.worldbank.org/INTREDESEADEADSEA/Resources/Study_of_Alternatives_Summary_AR.pdf

Jordan to set up water desalination projects on the Gulf of Aqaba. Then, the cost of desalinating and conveying one cubic meter of water to Amman (or to the urban centers of the other parties involved in the project) would be \$ 2. This is too expensive and by far higher than the costs of desalinating the Mediterranean water or the costs of desalinating and carrying water to urban centers through the Red-Dead project (projected at 1.1 to 1.5 dollars per cubic meter).

The report does not give recommendation as to what alternative is considered more feasible. However, it highlights that the use of water from Lake Tiberias, or through desalination plants, or from any other natural resources for the purpose of stabilizing the Dead Sea, is not considered among the strategies acceptable nor is applicable, as long as the three parties endure a chronic shortage of safe potable water. On the other hand, the report outlines that transferring water from the Mediterranean to Lake Tiberias or to the Dead Sea is fraught with adversary effects on the natural main underground water aquifer, let alone the impact on the highly- populated areas.

Transferring water from Turkey, on the other hand, is not viable now that it cannot offer 2 billion cubic meters of water per year, as was the case 20 years ago under what was then known as the 'Pipeline of peace.' Likewise, the transfer of water from the Euphrates- though economically viable- would make available very limited amounts of water due to the River's scant rate of flow.

In general, the study found only two alternatives that can meet the five previously mentioned goals: The Red Sea - Dead Sea Conveyor and the Mediterranean - Dead Sea Conveyor. The analysis shows that the cost of desalinating water in the second alternative is by far lower than in the first alternative (\$1.11-1.24 per cubic meter in the Mediterranean conveyor, compared with \$ 1.33-1.50 per cubic meter in the Red Sea conveyor). In addition, due to differences in elevation, the cost of conveying water from the Mediterranean to the Dead is only 65% of the cost of conveying water from the Red Sea.

Table 5: Comparing alternatives by cost standards

Alternative	Stabilize s the Sea level	Provides water to the 3 parties	Generates electricity from hydropower	Promotes regional cooperation	Cost of capital (\$ billions)	Net energy requirements (GW / h / year)	Environmental impacts		Social impacts	
							Before mitigation measures	After mitigation measures	Before mitigation measures	After mitigation measures
- Conveying water from the Red Sea: plus desalination	Yes	Yes	Yes	Yes	10	6	⊗	⊗ ⊙/	⊙	⊙
- Restituting the historical flow levels of the Jordan River	No	No	No	Yes	Unknown but costly	2	⊗	O	⊗	⊙
Conveying water from the Mediterranean to the Dead Sea - the southern route	Yes	Yes	Yes	Yes	5	5	⊗	⊙	⊙	⊙

⊗: Great impacts ⊙: Moderate impacts O: Positive effects

Table 5 compares 3 alternatives: (Restituting the historical flow levels of the Jordan River, Conveying water from the Red Sea, and Conveying water from the Mediterranean). The Table illustrates that Conveying water from the Red Sea, and Conveying water from the Mediterranean would fulfill the goals, while Restituting the historical flow levels of the Jordan River wouldn't achieve these goals. The Table also shows the environmental and social impacts of each project before and after mitigation measures.

Table 6 below shows the difference in costs of producing and conveying desalinated water for the Red Sea Project and the Mediterranean Project (to Amman) and the annual cost of the flow to the Dead Sea in the two projects.

Table 6: Comparison between three alternatives

Alternative	Observation	Potable water in Amman		Flow of water in the Dead Sea		Feasibility assessment
		Do quantities meet the demand?	Cost (2060) (\$ / m ³)	Are quantities sufficient to bring stability to the Dead Sea?	Annual cost (\$ millions)	
Red-Dead conveyor	High-level water desalination and water- powered electricity generation	Yes	1.11 1.24	Yes	226 -58	Medium/high
Mediterranean-Dead conveyor	Southern Route A: Ashkelon - north of the Dead Sea, water desalination and power generation	Yes	0.85 0.93	Yes	99 -60	Medium/high

In short, the study concludes that these two alternatives (conveying water from the Mediterranean to the Dead Sea with power generation and water desalination, and conveying water from the Red Sea to the Dead with power generation and water desalination) are the most viable alternatives that meet the five requirements. The report, however, lays emphasis on managing the environmental and social problems associated with the implementation of any of the projects.

2.3 The Social and Environmental Assessment¹⁸

The Social and Environmental Assessment Study (published in July 2012) tackles the problems of environmental and social impacts associated with the implementation of the Red-Dead Project. The problems mainly involve the potential impacts on water bodies on both sides of the project; the natural environmental systems and heritage of the region; as well as the hardship and disturbances of the people living in and around Wadi Araba.

Table 7: Summary of Potentially Most Significant Issues (with and without Environmental and Social Management Plan)

Theme	Key issues	Significance	
		Implemented as outlined in the feasibility study	Implemented with Environmental and Social Management Plan
Dead Sea	Dead Sea appearance and water quality, and integrity as a heritage site	⊗	©
Red Sea	Effects on water quality, turbidity and coral dynamics during construction and operation	©	○
Hydrology & flood risk	Risk of breaches in facility during major floods and consequent impacts on surface waters	©	○
Archaeology & cultural property	Potential disturbance of some 48 important archaeological sites	⊗	©
Social & socioeconomics	Land take, land use changes, interaction of residents with migrant workforce	⊗	©
Landscape & visual	Appearance of large desalination plant in Wadi Araba & hydropower plant in Dead Sea Basin	⊗	©
Environment	Construction disturbances to migratory birds, protected areas, endangered species, sensitive habitats	⊗	©
Hydrogeology	Catastrophic failure of pipeline leading to salinity of groundwater in Wadi Araba	⊗	©
Public Health	Risk of traffic accidents during construction	©	○
Nuisances & disturbances	Noise disturbance in some areas during construction	⊗	©
Energy demand & climate change	Significant use of non-renewable resources envisaged	⊗	©

Key: ⊗ major risks © moderate risks ○ slight-none risks

¹⁸ World Bank (July 2012): Red Sea-Dead Sea Water Conveyance Study Environmental and Social Assessment http://siteresources.worldbank.org/INTREDESEADEADSEA/Resources/Environmental_and_Social_Assessment_Summary_AR.pdf

Table 7 summarizes the major potential environmental and social problems detected. The report addresses these problems in detail. The most prominent challenge is the damage to the unique natural system of the Dead Sea, due to mixing its water with the Red Sea water, or brines created from the process of desalinating Red Sea water.

The report examined the alternatives outlined in the feasibility study and concluded that there are 8 aspects of high environmental and social risks (see column 3 in Table 7). Accordingly, the study concluded that, from an environmental- social perspective, the alternatives that have been analyzed in the feasibility study cannot adequately reduce the risks.

The Social and Environmental Assessment Study set forth some proposals to mitigate the risks. If applied properly, these measures would significantly reduce the risks at different levels (see the last column in the table). The report concluded that

With appropriate attention to the implementation, supervision and monitoring of the ESMP, it is our judgment that the Scheme could be implemented without unacceptable environmental or social impacts, and in so doing achieve the first of these aims. However, some uncertainty remains with regard to the potential effects of the Scheme on the Dead Sea and therefore its ability to meet the aim of stabilizing levels in the Dead Sea without causing damage to other aspects that contribute to its cultural value. This uncertainty relates to the likely scale and duration of effects on the biophysical characteristics of the Dead Sea under different inflow conditions. Reducing this uncertainty will require further monitoring and research, leading to the development of effective mitigation strategies and measures if required; these could include the option of limiting inflows to the Dead Sea in future. In summary, the above impacts could be reduced but not necessarily eliminated by a combination of the following: A phased approach combined with a proactive public engagement effort to explain risks versus benefits and build consensus before deciding whether and how to progress beyond the first phase; physical trials; and further studies and monitoring to inform the phased approach.

3. Key Discussion Questions

- ✧ How to read the World Bank's preliminary studies on the project? Were they comprehensive? Did they give satisfactory answers? Did the World Bank conduct objective assessments?
- ✧ Does the Palestinian party play its role on an equal footing with the other target parties? In other words, does the Palestinian side still have the opportunities to call the shots?
- ✧ What are the Palestinian potential gains from the project, and the odds of materializing these gains?

Attendance Record
PNA 2012 Budget: Plan vs. Implementation

Name	Institution
Fathi Sorouji	Birzeit University
Marwan Ghanem	Birzeit University
Mo'taz Abbadi	Water Authority
Taghreed Hithnawi	Ministry of Planning
Ahmed Hindi	Water Authority
Abdul-Rahman Tamimi	Palestinian Hydrology Group
Deeb Abdul-Ghafoor	Water Authority
Eman Nayef Hamed	Palestine TV
Nael Mousa	Alhaya Aljadeedah
Eman Salahuddin	Alhaya Aljadeedah
Samah Bsharat	Alhaya Aljadeedah
Omar Jayousi	Contractors Union
Dr. Jad Isaac	Applied Research Institute - (ARIJ)
Raed Abd Rabbo	Applied Research Institute - (ARIJ)
Ann Kristin Heinz	Friedrich Ebert
Abeer Botma	The Palestinian Environmental NGO's Network (PENGON)
Saleh Rabi	Palestinian Water Training Institute
Aya Rabi	PSBS
Natasha Carmi	Negotiations Affairs Department
Abboud Hamayel	Negotiations Affairs Department
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Afeef Eseid	Ministry of Public Works and Housing
Clemens Messerschmid	Rosa Luxemburg
Dr. Omar Asmar	Fuad Nassar Association for Development Studies
Aql Abu Qare'	
Dr. Hazem Shinnar	Ministry of National Economy
Wa'd Bani Odeh	MAS
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Doja Michael	MAS
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