Friends of the Earth Middle East
جمعية أصدقاء الأرض الشرق الأوسط
ידידי כדור הארץ המזרח התיכון

EcoPeace

Community Based Problem Solving on Water Issues

CROSS-BORDER "PRIORITY INITIATIVES" OF THE GOOD WATER NEIGHBORS PROJECT

October, 2013

EcoPeace / Friends of the Earth Middle East
Amman, Bethlehem and Tel Aviv

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SWEDEN


"Good Water Neighbors" Communities
Legend
Mountain Aquifer – Recharge Zone
Mountain Aquifer – Confined Area
Coastal Aquifer
Jordan River – Dead Sea Basin
Lake
Stream/River
Israeli Communities
Palestinian Communities
Jordanian Communities
Haifa
Nazareth
Sea of Galilee
Jordan Valley
Al-Hemma
Yarmuch River
Muaz Bin Jabal
Mugata/Kishon River
Gilboa
Jalameh, Jenin
Beit Shan
Wadi Harod
Tabkat Fahal
Wadi Ziglab
Sharhabil bin Hassnah
Baka Gharbia-Jat
Wadi Abu Nar
Wadi Hadera
Wadi Alexander
Baka Sharkia
Emek Hefer
Tulkarem
Wadi Zomar
Jordan River
Jordan
Nablus
Yarkon River
Wadi Kane
Palestine
Wadi Fara
Wadi Zarka
Tel aviv
Deir Alla
Fasayel
Israel
Wadi Auja
Auja
Amman
Wadi Qelt
Jericho
South Shouna
Abu Dis
West Jerusalem
East Jerusalem
Wadi Nar/Kidron
Tsur Hadassah
Wadi Fukin
Bethlehem
Dead Sea
Gaza
Yatta
Wadi Hebron
Wadi Azza
Abasan
Eshkol
Wadi Beer Sheva
Beir Sheva
South Ghour
Tamar
Gour Fifa

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FoEME GWN Priority Initiatives Team:

Michal Sagive, Israeli GWN Project Coordinator
Mohammed Obidallah, Palestinian GWN Project Coordinator
Hana Al-Asad'd, Jordanian GWN Project Coordinator
Maya Aberman, Israeli GWN Project Assistant
Manal Al Khateeb, Palestinian GWN Project Assistant
Abdullah Dreiat, Jordanian GWN Project Assistant
Gidon Bromberg, Israeli Director
Nader Khateeb, Palestinian Director
Munqeth Mehyar, Jordanian Director
Michal Milner, Language Editing

EcoPeace/ Friends of the Earth Middle East (FoEME)
is a unique organization at the forefront of the environmental peacemaking movement. As a tri-lateral organization that brings together Jordanian, Palestinian, and Israeli environmentalists, our primary objective is the promotion of cooperative efforts to protect our shared environmental heritage. In so doing, we seek to advance both sustainable regional development and the creation of necessary conditions for lasting peace in our region. FoEME has offices in Amman, Bethlehem, and Tel-Aviv.

Note of Gratitude
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For more information on FoEME or to download any of our publications please visit: **www.foeme.org**

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PRIORITY INITIATIVES OF THE "GOOD WATER NEIGHBORS" PROGRAM

Community Based Problem Solving on Water Issues

Against the backdrop of renewed direct negotiations between Israelis and Palestinians which began in July 2013, the work of EcoPeace / Friends of the Earth Middle East through the Good Water Neighbors Project is more important than ever.

In 2001, FoEME launched the "Good Water Neighbors" (GWN) program to raise awareness of the water problems shared by Palestinians, Jordanians, and Israelis. The program identifies cross-border communities whose mutual dependence on shared water resources is utilized as a basis for cooperation on sustainable water management. The project has created real improvements in the water sectors of participating communities. More than a decade ago, the project struggled to identify 11 communities who would agree to work together. Today, it boasts 28 communities with further expansion requested but limited by financial constraints. Communities are grouped not only by a shared stream or spring, but also according to larger shared watersheds and aquifers, with 14 communities sharing the Jordan River / Dead Sea Basin, and 14 communities sharing the Mountain and Coastal Aquifer and Coastal Streams Watersheds. (See Tables 1 and 2)

FoEME works with municipal staff and residents in each GWN community to identify and address sources of pollution, to advocate for increased water supply and to find ways to answer the needs of our cross-border communities through projects that protect the shared environmental heritage. The GWN project's constituency of community residents, including adult and youth activists, mayors, and municipal staff, exerts enormous 'bottom-up' pressure on national decision makers in order to generate the political will needed to advance solutions at the national and regional level.

The program's successes are testaments to its sound rationale and the impacts of these investments beyond the direct benefits for the communities involved. FoEME's ability to help leverage investments which support and enhance projects provides the evidence to convince mayors and municipalities that cooperation with the other side brings positive results. Thus, the experience gained from early phases of the GWN program led FoEME to conclude that investing more resources and project time to leverage funds would result in increased cooperation and positive relations between the cross-border GWN communities as well as concrete improvements for the region's water infrastructure and environment.

As a logical extension of this successful model, and recognizing that the current threatened state of the region's shared water resources demands immediate action; FoEME advocates reaching a Final Accord between Israel and Palestine on the issue of water, not independent of, but as a catalyst of a final status agreement on all issues. Given the dire Palestinian need for more water availability; Israel's new water supply due to large scale desalination and waste water reuse; and a joint need to deal with untreated sewage, reaching an agreement on water as a first priority makes economic, ecological, and most importantly, political sense. An agreement would greatly improve the current living conditions of both peoples. For Palestinians, it would increase fresh water availability in every home; for Israelis, it would remove pollutants from rivers and streams that flow through its main cities. Reaching a final status agreement on water will help build trust necessary to put the political process between Israel and the Palestinians back on track, and will give hope to both peoples that a diplomatic solution to their conflict is possible. Resolving water issues provides an urgently needed win /win and advances the two-state solution by reaching a Final Accord on one of the final status issues.

This is the third publication that describes the efforts of the GWN team and identifies a new set of environmental challenges and provides feasible solutions – defined as "Priority Initiatives". In the years preceding the adopting of the Priority Initiatives methodology, FoEME was successful in leveraging an estimated US$400 million of investments in GWN communities in Palestine, Jordan and Israel. During the past 2 years, since the adoption of the Priority Initiatives methodology, FoEME has successfully helped leverage more than $120 Million towards the implementation of Priority Initiatives, grouped here by project category;

• Sanitation Solutions including advancing sanitation solutions in the west Bethlehem villages, completion of the Baka Sharkia sewage collection network and its link to the Israeli side WWTP and waste water

sanitation solutions for the GWN communities in Jordan: US$10,500,000

• Industrial Pollution Remediation including addressing cross border industrial wastewater pollution of the Zomer/Alexander Stream and removing industrial wastewater from the Hebron stream: US$77,500,000

• Stream Rehabilitation/Cross Border Parks/Open Spaces including cross border preservation of terraced landscapes in the Jerusalem/Judean hills, development of the Hadera/Abu Naar stream cross-border park, stream rehabilitation and cross border park for the Kishon/Naher al Mukataa Stream, the Jordan River Peace Park and the rehabilitation of the Harod stream: US$36,000,000

Advancing Priority Initiatives:

Consultations

FoEME staff have reached out to stakeholders, decision makers and funding bodies to identify the priority projects needing advancement in each community. Special consideration was given to issues relating to cross-border water and environmental concerns and Initiatives that are likely to reduce sources of tension between neighboring communities and which promote efficient management of shared water resources. The format of the consultations differed for each community but included open community forums, private discussions with decision makers, consultations with researchers, and meetings with groups of local environmental activists. All consultations aimed to identify the most immediate issues of concern for the local community and achievable, practical steps that can be taken to advance the kinds of initiatives that respond to these areas of concern. Finally, the Priority Initiatives were considered with respect to national priorities in Palestine, Israel, and Jordan.

Developing Project Briefs

With the above data gathered, FoEME staff investigated what actions had already been planned, conducted or launched and sought to identify practical next steps, resulting in the Project Briefs for each Priority Initiative as presented in this publication. Project Briefs outline the current state of affairs with respect to threats and opportunities to the environment and water supply, the objectives that each proposed response aims to achieve, and the steps required in advancing each Priority Initiative. Each Project Brief is designed as a roadmap to guide the efforts of stakeholders through project activities and as a tool for informing government decision makers and international donor organizations about the Priority Initiatives.

Gaining Support for Solutions

Site visits have already taken place in many of the communities to highlight the need for solutions, and have included participation of media, decision makers, international donor institutions and active residents. FoEME's Neighbors Path Trails, which were developed in earlier phases of the GWN program, are another tool to highlight the importance of the Priority Initiatives to visitors and residents who use the trails. Additional site visits between neighboring cross-border communities were held to emphasize the interrelated nature of water issues that the Priority Initiatives seek to address.

Decision makers on the national and regional level have been addressed by FoEME staff in several meetings, and many more advocacy meetings are planned for the coming year. The Project Briefs are being publically released at FoEME's annual GWN conference, another important forum which brings together FoEME's regional network of stakeholders with decision makers.

Abbreviations

APC – Arab Potash Company
BGU – Ben Gurion University
DSW – Dead Sea Works
FoEME – EcoPeace/Friends of the Earth Middle East
GIS – Geographic Information System
GWN – Good Water Neighbors Program
ISO – International Organization for Standardization
JICA – Japan International Cooperation Agency
JVA – Jordan Valley Authority
KFW - Kreditanstalt für Wiederaufbau/
German Development Bank
LJR – Lower Jordan River
MCM – Million Cubic Meters
MoU – Memorandum of Understanding
MWI – Ministry of Water and Irrigation (Jordan)
NGO – Non Governmental Organization
PWA – Palestinian Water Authority
RC – Regional Council
USAID – U.S. Agency for International Development
UNESCO – United Nations Educational, Scientific,
and Cultural Organization
UNDP – United Nations Development Programme
WAJ – Water Authority of Jordan
WWTP – WasteWater Treatment Plant

Table 1: Partnering communities by country:

Israeli communities	Palestinian communities	Jordanian communities
Jordan Valley Regional Council		*Muaz Bin Jabal* *Himma*
Beit She'an / Springs Valley Regional Council	*Fasayel*	*Tabket Fahel* *Sharhabil bin Hassneh*
Gilboa Regional Council	*Jenin / Jalameh*	
Baka Gharbia	*Baka Sharkia*	
Emek Hefer Regional Council	*Tulkarem*	
Tzur Hadassah / *Mateh Yehuda Regional Council*	*Wadi Fukin / West Bethlehem Villages*	
	Auja	*Dier Allah* *South Shouneh*
Tamar Regional Council	*Jericho*	*Safi* *Fifa*
Eshkol Regional Council	*Abasan (Gaza)* *Yatta*	

Table 2: Community cooperation by geographic / water basin orientation:

Jordan River / Dead Sea	Mt. Aquifer	Coastal Aquifer
Jordan Valley Regional Council (Is) *Beit She'an / Springs Valley Regional Council (Is)* *Tamar Regional Council (Is)* *Fasayel (P)* *Auja (P)* *Jericho (P)* *Muaz bin Jabal (J)* *Himma (J)* *Tabket Fahel (J)* *Sharhabil bin Hassneh (J)* *Dier Allah (J)* *South Shouneh (J)* *Safi (J)* *Fifa (J)*	*Baka Gharbia (Is)* *Emek Hefer Regional Council (Is)* *Tzur Hadassah / Mateh Yehuda Regional Council (Is)* *Baka Sharkiya (P)* *Tulkarem (P)* *Wadi Fukin / West Bethlehem Villages (P)* *Yatta (P)* *Jenin / Jalameh (P)*	*Eshkol Regional Council (Is)* *Abassan (P)*

1 CREATING A MUNICIPAL CROSS-BORDER HADERA/WADI ABU NAAR STREAM COMMITTEE

Partnering Communities:

Baka Al Gharbia, Israel: An Arab Israeli city situated at the north Sharon Region; home to approximately 26,000 residents.

Municipality of Baka Al Sharkia and Al-Nazlat, Palestine: A cluster of Palestinian towns situated in the northern Tulkarem region; home to approximately 10,000 residents.

Shared Waters:

Topographically, the adjacent communities of Baka Al Gharbia, Baka Al Sharkia and Al-Nazlat are situated over a particularly vulnerable area of the Mountain Aquifer's western basin, a principle fresh-water resource for both Israelis and Palestinians. Flowing over the Mountain Aquifer and through these two communities is the Hadera/ Wadi Abu Naar stream that flows westwards from the Shomron / Nablus Mountains to the Mediterranean Sea, crossing on its way over the Green Line.

Figure 1: Cross-border meeting between representatives from Baka Sharkia-Al-Nazlat and the Municipality of Baka Gharbia November 2012

Problem Statement:

Baka Al Gharbia, Baka Al Sharkia and Al-Nazlat share water resources and face common challenges in finding sewage solutions and rehabilitating the Hadera / Wadi Abu Naar Stream. However there is a current lack of coordination between these communities with respect to these important issues. Furthermore, due to the lack of a sewage network, residents in Al-Nazlat use traditional cesspits or septic tanks to collect domestic waste water. These are emptied by vacuum trucks and disposed of in the Hadera/ Wadi Abu Naar stream, resulting in the pollution of the surface and groundwater and damage to the surrounding environment.

Priority Initiative:

Establishment of a Municipal Cross-Border Stream Committee, including all riparian communities and FoEME, that would advance the preparation and implementation of an integrated Regional Rehabilitation Plan for the Hadera/Wadi Abu Naar Upper-Stream and its development as a Cross-Border Park, for the benefit of both communities. Part of the integrated plan would be the establishment of a sewage network for the two Villages (Al-Nazla Tehta and Al-Nazla Al-Wosta), connecting them with the Baka Al Sharkia network which is to be connected with the Baka Al Gharbia wastewater treatment plant.

Background Issues Relevant to the Priority:

Until recently, raw sewage from both sides of the Green Line drained into the Hadera/Abu Naar Stream causing widespread health hazards to the local population and contaminating the groundwater of the Mountain Aquifer. The situation of neglect resulted in the river banks being turned into dumping sites for household, agricultural and livestock waste and a burning site for used tires. During winter, flood waters would carry the sewage and solid waste of both communities down the Hadera/Abu Naar Stream all the way to the Mediterranean Sea. In the framework of the GWN Project in July 2007, the mayors of Baka Al Garbiya and Baka Al Sharkia signed a Memorandum of Understanding (MoU) agreeing to cooperate on cross-border water issues, aiming to advance shared sewage solutions and the rehabilitation of the Hadera/Abu Naar Stream. Following the MoU's signing, substantial investments were made in order to realize local environmental cooperation.

Through Israeli government loans, Baka al Gharbia built its own WWTP and joined a local water and sewage corporation to operate and manage the facility. Currently, through additional loans and municipal funds, Baka Al Gharbia's sewage network is being extended gradually to connect all households in the city. The Joint Israeli-Palestinian Water Committee approved the FoEME-initiated idea to treat Baka Al Sharkia's sewage in the new WWTP completed for Baka Al Gharbia. Under the implementation of the PWA and with the financial support of UNDP and JICA, a sewage collection system was planned and built for the city of Baka al Sharkia and neighboring communities. The actual connection of the two sewage networks is presently hindered due to several disagreements, mainly on the issue of whether or not to build an emergency sewage pond on Baka Sharkia's side and the need to sign an MoU between the Palestinian and the Israeli water authorities on the costs to be charged for sewage treatment. The request for an emergency sewage pond is based on the need to protect the Israeli WWTP in cases of illegal industrial sewage flow into the Baka Sharkia system, while the MoU signing would be a comprehensive and binding cross-border agreement for all cross-border sewage management between Israel and the Palestinian Authority.

Baka al Gharbia was awarded a grant to the value of 200,000 NIS (56,000 US$) from the Israeli Ministry for Regional Cooperation for planning of rehabilitation of the Hadera/Abu Naar Stream on the Israeli side. The coordination required between different government bodies within Israel for the implementation of this project has proved challenging. In parallel, the Dutch Ministry of Development Cooperation has awarded 500,000 dollars for planning of the rehabilitation of

the Hadera/Abu Naar Stream on the Palestinian side.

Objectives:

• Create Municipal Cross-Border Stream Committee to advance the Hadera/Abu Naar Stream rehabilitation projects
• Ensure the development of an integrated plan for rehabilitation of the stream, both on the Israeli side and on the Palestinian side.
• Establish a sewage network for the two villages (Al-Nazla Tehta & Al-Nazla Al-Wosta), connecting them with the Baka Al Sharkia network which is to be connected with the Baka Al Gharbia wastewater treatment plant.
• Facilitate the completion of the sewerage connection project by advancing the signing of contract between the PWA and IWA.

Project Characteristics:

• Arrange cross-border meeting between the Mayors of Baka Al Gharbia and the Municipality of Baka Al Sharkia and Al-Nazlat to sign the MoU creating the Municipal Cross-Border Stream Committee.
• Arrange meeting with all stakeholders to resolve conflict over project planning
• Assist the IWA and PWA to reach an agreement on project plans for cross-border sanitation
• Connect the sewage systems of Baka Al Sharkia and Baka Al Gharbia.

Cross-Border Impact:

The Hadera / Wadi Abu Naar Stream is one of many in the region that originate in the Palestinian highlands and flow westward to the Mediterranean Sea through Israel, or, in one case, eastward to the rift valley. The Municipal Cross-Border Stream Committee presented in this Priority Initiative would be the first of its kind in the region, setting a precedent by institutionalizing what is becoming regarded as international best practice by providing for continuous, cooperative water management based on agreed-upon rights and responsibilities as well as ongoing monitoring and dispute resolution mechanisms. That is, water is shared by rules that are designed to protect the ecosystem for everyone's benefit, and then deliver water to different parties in ways that meet their needs and allow for their development. Such a cross-border stream authority is one of the building blocks of *An Agreement to Share Water Between Israelis and Palestinians: The FoEME Proposal.*

Figure 2 : Cross-border meeting between representatives of the Municipality of Baka Sharkia & Al-Nazlat and the Municipality of Baka Gharbia. November 2012

Figure 3: Pollution of the Hadera/Wadi Abu Naar Stream

2 PREVENTING POLLUTION OF THE HEBRON/ BE'ER SHEVA/BESOR STREAM BY ISRAELI SOURCES

Partnering Communities:

Eshkol Regional Council, Israel: Eshkol RC is situated in the north-western Negev Desert and comprises 31 communities with mainly agricultural lands. It is one of the largest regional councils in Israel with over 760,000 dunams ranging from the west side of Be'er Sheva to the Gaza Strip.

Abasan, Palestine: Abasan is situated in the southern Gaza Strip, in Khan Younis Governorate with a population of approximately 28,000 inhabitants

Figure 1: Cross-border map of the Hebron/Be'ersheva/Besor/ Wadi Azza Stream

Shared Waters:

The Hebron Stream basin is the largest of the cross-border streams, beginning in the Hebron Hills in Palestine, flowing through Yatta and then across the Green Line to merge with the Be'er Sheva stream in Israel, that later merges with the Besor Stream before flowing into Wadi Gaza and the Mediterranean Sea. The stream flows over an area of both the Mountain and Coastal Aquifers. The natural state of the stream is as a seasonal stream, flowing only during times of flash floods. The location of the Gaza Strip at the corner of the land bridge connecting the continents of Africa and Eurasia, make it a bottleneck for migratory birds. The passage of many migratory birds between the Orient and the Nile valley also takes place through the Gaza Strip. Wadi Gaza is considered as one of the most important coastal wetlands located on the Eastern Mediterranean Basin, very rich in biological diversity (both flora and fauna).

Problem Statement:

A significant portion of the pollution currently flowing in the stream originates from the Hebron City area, the settlement of Kiryat Arba, and surrounding Palestinian villages. Illegal discharge of sewage and low quality effluents to the stream also occurs after the stream has crossed the Green Line into Israel. According to preliminary assessments there is, within Israel, between 4000 and 5000 cubic meters of untreated sewage being discharged to the Hebron/Be'er Sheva stream every day. This volume of waste water is from a variety of sources – industrial, commercial and municipal. In addition, at several sites along the stream, solid waste is being dumped into the stream. The Shoket Waste Water Treatment Plant and the pumping station south of Be'er Sheva are also responsible for the discharge of 6000 cubic meters of low quality effluents to the stream on a daily basis. In addition, during winter and at times when the WWTP is incapable of dealing with the quantities of sewage it receives, the Shoket WWTP discharges between 2000 and 5000 cubic meters per day of untreated sewage to the stream , most notably during religious holidays. Wadi Gaza faces many environmental challenges that affect public health. The Wadi is used as a point to collect sewage from the middle area refugee camps and as a solid waste-dumping site. Pollution from the various sources severely impacts the shared ground and surface waters, the environment, and the lives of Palestinian and Israeli communities residing throughout the drainage basin, and along the stream.

Priority Initiative:

Prevent dumping of sewage/low quality effluents from Israeli sources into the Hebron/Be'er Sheva/Besor Stream after the stream crosses the green line into Israel, until it crosses in Gaza.

Background Issues Relevant to the Priority:

In the absence of effective coordination on pollution control between Israel and the PA, Israel turned to "end of pipe" solutions in building the Shoket WWTP on its side of the border. This plant has been expanded twice already and its capacity has doubled, yet it still fails to cope with the growing quantities of high toxicity solids that characterize the Hebron stream flow. Every day, 15,000 cubic meters of sewage flow into the stream from Palestinian sources. From Israeli sources, 6000 cubic meters of low quality effluent flow into the stream and an additional 2000-5000 of untreated sewage, depending on various factors. In December 2009 the Palestinian Water Authority (PWA) presented an emergency plan to prevent the illegal dumping of slurry into the municipal sewage system. Overall, pressure from the local communities and civil society finally brought all sides to communicate and coordinate a joint effort to deal with the industrial pollution problem at least in the short term. Meetings between the Israeli Civil Administration, Palestinian Water Authority, Hebron Municipality, the Union of Stone and Marble and donors have led to some breakthrough. A Steering Committee of key Palestinian parties was established and, following a consultation process with USAID, has launched a temporary but extensive clean-up program starting July 1, 2012.

In 2002, a detailed master plan for the restoration of the Besor basin was completed. Development of this plan began in 1999 with data collection of conditions across the Watershed. The Directorate for Restoration and Development

of the Besor Stream, composed of many governmental and non-governmental bodies, includes the Ministry of Environmental Protection, the Jewish National Fund and the Besor-Shikma drainage authority. Objectives of this plan include: preserving the natural flow regime of the stream while preventing damage, removal of pollutants and nuisances and preventing development that will damage the stream. A review of the current status of affairs with respect to these objectives illustrates that there is a long way to go in realizing this vision for the Besor basin.

Shoket WWTP undertakes tertiary treatment of approximately 8500 cubic meters. There were plans to expand to 12,000 cubic meters in March. This has not yet happened and currently, the reservoir is also not functional. A plan to expand to 50,000 has already been drafted but implementation of such an expansion has not begun. There is opposition to the expansion from some settlements in the area and some settlements who have not made a financial commitment to the expansion (Meitar).

Wadi Gaza, being the biggest in Gaza, one of the biggest in Palestine and representing tremendous potential in terms of conservation, recreation and eco-tourism, was announced as a natural reserve area in 2001. The UNDP has provided $3 million to date to maintain it as a nature reserve area; but unfortunately it is still used as a dump site for solid waste and sewage. This is because this area of Gaza lacks any sewerage network. The establishment of a sewerage network, treatment plant and associated infrastructure would require significant capital investment. This amount was available but the project has been delayed by political obstacles. In the interim, the Red Cross has initiated a project establishing initial treatment ponds for sewage in this area, and subsequent pumping to the sea. The Red Cross has committed $2 million to the project.

Objectives

• Eliminate discharge of wastewater to the stream by Israeli sources of pollution

Project Characteristics

• Identify sources of illegal discharge of sewage to the stream
• Identify operational and policy loopholes allowing for discharge of pollutants to the stream
• Support efforts of the Ministry of Environment Protection to identify and prevent illegal discharge of sewage to the stream
• Create awareness in relevant civil society forums (e.g Hebron Stream Forum) about pollution by Israeli sources of the stream
• Continue to provide information about progress made on both sides of the Green Line to the respective neighbors.

Cross-Border Impact

Protecting the largest cross-border stream in the region is an undertaking that requires action by all stakeholders, across borders and in cooperation with all residents of the region. Action in Israel to eliminate pollution of the stream reinforces existing efforts underway in Palestine and contributes towards burden-sharing between partners who are generally viewed as being in conflict with one another.

Figure 2: Sewage flowing into the Hebron Stream near Meitar in Israel

Figure 3: Sewage and debris from flowing into the Beersheva Stream in Beersheva

3

PROTECTING THE NATURAL SPRINGS OF THE JUDEAN/JERUSALEM HILLS

Partnering Communities:

Tzur Hadassah / Mate Yehuda Regional Council, Israel: Located in the Judean/Jerusalem Hills along the Mountain Aquifer and home to over 40,000 residents living in 57 communities.

Wadi Fuqin / West Bethlehem Villages, Palestine: Situated west of Bethlehem, the five villages of Battir, Husan, Nahhalin, Wadi Fuqin, and Wallajeh have a total population of approximately 24,000.

Shared Waters:

Mate Yehuda and the West Bethlehem villages both share the Mountain Aquifer, a principle water source for both Israelis and Palestinians. Springs located in the hillsides on both sides of the Green Line have provided the foundation for traditional agricultural cultivation of olive groves, vineyards, fruit trees, and vegetables along the hillsides for generations. On the Israeli side, in the Mate Yehuda RC there are more than 70 natural springs. The springs constitute a growing source of attraction/recreation for local and foreign visitors, a lifeline to the surrounding nature and a testimony to the cultural and agricultural heritage of the area. The springs act as important indicators of the quality of ground water as well as providing unique habitats that support local ecosystems. The springs are an important link to the past and represent an invaluable potential resource for eco-tourism development. On the Palestinian side, the five villages of Battir, Husan, Nahhalin, Wadi Fukin, and Walajeh face severe environmental and human health issues due to the pollution of springs by untreated wastewater. Though located on top of the Mountain Aquifer, the springs of Wadi Fukin are fed from a very shallow perched aquifer whose small recharge basin includes areas of Tzur Hadassah, Wadi Fukin and Beitar Elite.

Problem Statement:

This Priority Initiative focuses on challenges being faced by springs on the Israeli side of the Green Line. It is hoped that protection and rehabilitaiton of the springs on the Israeli side will be a first step that could later be adapted and implemented on the Palestinian side.

Deterioration in the physical state of the land and the construction of structures around the springs is a common threat. Many of the springs are situated close to human settlement and are negatively impacted by the activities (construction, infrastructure expansion) that occur there. Population growth also affects recharge and creates a growing potential for sources of pollution and contamination, especially due to inadequate sewage treatment facilities (these, when present, also present a cross border management challenge). Anthropomorphic effects can be detected in long term monitoring of mountain aquifer spring water. Data collected by the Israeli Nature and Parks Authority in 2011 suggests potential anthropogenic effects in over 25% of springs with water (46 out of 67 surveyed had water in spring 2011), possibly due to inadequate sewage infrastructure or over fertilization. Many of the springs have been neglected or destroyed. Yet other springs are undergoing privately funded processes of renovation or rehabilitation, but in a somewhat

sporadic and uncoordinated manner. While these initiatives are motivated by a commitment to the value of the resource, they often lack professional expertise and face time and budgetary constraints.

Besides the physical threats to the integrity of the springs, protection of the springs faces administrative challenge as well. The springs do not fall under the jurisdiction of any single authority; rather different springs are the responsibility of different parties. Among these are KKL, the Nature and Parks Authority, Mate Yehuda Regional Council, individual settlements and the Sorek Drainage Authority. As a result there is no integrated or comprehensive management strategy or planning process for the protection of these springs and no information sharing about the springs between the different authorities or in the public domain.

Priority Initiative:

Promote awareness as to the importance of these springs, the need for their protection and sustainable use through facilitating the creation of a multi-disciplinary forum, including representatives from relevant environmental and infrastructure authorities, environmental and public interest organizations, to advance and support an integrated policy and planning process for the protection and enhancement of the natural springs found on the Israeli side of the Judean/ Jerusalem Hills.

Background Issues Relevant to the Priority

Currently, there is no master plan for the springs, and they are not included in any national or regional planning frameworks. As a result guidelines, for the various authorities for whom the preservation of the springs is relevant, do not exist. The regional council seeks to expand upon its capacity with the necessary skills and expertise to undertake conservation and enhancement of the springs. Conservation and enhancement of the springs impacts on and is in turn impacted upon by the actions of a variety of different government authorities and functions. As such, the successful implementation of such processes relies on cooperation and coordination between different authorities and bodies.

In March 2013, a 1 day conference was held in the Mate Yehuda Regional Council on the subject of the natural springs of the Judean/Jerusalem Hills. The conference was organized and facilitated by FoEME. In attendance were interested parties from the following fields; environment, tourism, archaeology, hydrology, ecology, planning and enforcement. The participants split into working groups and were tasked with responsibility for making concrete suggestions towards the remediation of the problems facing the natural springs. These suggestions form the basis for this priority project.

A 2011 survey undertaken by Ariel Cohen for the Nature and Parks Authority provides some information about the springs. The survey tested water quantities and qualities and exposed data concerning drying up of springs and contamination of springs. There is however, a lack of detailed information about all the springs that addresses criteria and provides data on; geology, archaeology, ecology, landscape heritage, existing rehabilitation efforts, as well as the need to provide information about the following; land usage, zoning, authorities responsible etc. Gathering this information in a coherent and comprehensive manner would allow for the identification of knowledge gaps. Such a study would inform a policy and planning process that would be appropriate and grounded.

Objectives:

- Support and cooperate with residents in conservation and enhancement of the springs and their surroundings
- Boost Judea Hills landscape heritage value (spring and terraces)
- Support sustainable tourism and agriculture
- Be the basis for future cross-border cooperation

Project Characteristics:

- Creation of a forum
- Facilitate a study that will provide detailed information about all the springs and propose a strategic management program for the springs
- Present implementation plan
- Promote pilot of three focal springs and their surrounds as model for planning and development, led by the Mate Yehuda Regional Council
- Raise awareness and undertake education about the importance and value of the springs through cooperation with the Education Department of the Mate Yehudah RC and the campaign activities of the GWN Water Trustees
- Develop the springs as a source of and venue for inter-cultural exchange

Cross-Border Impact:

The Judean Hills natural springs and by extension the Mountain Aquifer are shared resources that are part of a unique, ancient eco-cultural system encompassing water sources, flora and fauna and archeological sites. Thousands of years of human settlement and livelihood was determined by the dispersion of the springs as the stable, local water source. These constitute the basis for the landscape as we experience it today, including the adjoining terrace formations. Their function and significance for people and cultures are altered at different rates in the neighboring communities, yet still convey an integrated environment. The residents of Mate Yehuda and West Bethlehem share similar challenges concerning the springs and their value in transformation from agriculture to agro-tourism, and from the exploitation of natural resources to responsibility for their sustainability. Protection and rehabilitation of the springs on the Israeli side is a contribution towards maintaining the integrity and sustainability of our shared water resources and a first step that could later be adapted and implemented on the Palestinians side.

4 DESIGN AND SUPERVISION OF ABASAN WASTE WATER NETWORK

Partnering Communities:

Abasan Al-Kabira, Palestine: Abasan Municipality is situated in the southern Gaza Strip, in the Khan Younis Governorate, and is home to approximately 28,000 residents.

Eshkol Regional Council, Israel: Eshkol RC is situated in the north-western Negev Desert and has 13,000 residents living in 31 communities. It is one of the largest regional councils in Israel with over 760,000 dunams ranging from the west side of Be'er Sheva to the Gaza Strip

Shared Waters:

Abasan and Eshkol RC are located on the Coastal Aquifer. Recharge of the aquifer takes place from direct rainfall and from surface water streams and flood events. For Abasan as for the whole of the Gaza Strip, clean fresh water resources are extremely scarce. Residents are wholly dependent on the ground water aquifer for all of their water needs, and this has led to the over pumping of the aquifer's water. Most of the wells in the Gaza Strip are now too saline for domestic use though the population has no other resource to turn to. Water for agricultural use is supplied by 17 wells, in addition to water imported from the Al-FAO Company.

Problem Statement:

Abasan has no sewage network. Instead, families collect waste water in septic tanks outside of each house. There are approximately 3,069 cesspits in the village that are not lined and allow the waste water to seep into the ground water, polluting it and threatening public health. The current practices of sewage disposal cause ground water pollution, where, the water resources in Abasan are very limited. Abasan is at a critical juncture in terms of water quality, that requires immediate and concerted efforts.

Priority Initiative:

The project aims to develop a pre-feasibility study and a master plan for a collective sanitation system in Abasan, including the construction of a 20 km waste water network, sewage pumping stations, and a treatment plant.

Objectives:

Improve the sanitary conditions in Abasan and the quality of the Coastal Aquifer.

Project Characteristics:

1. Undertaking pre-feasibility and design studies of waste water solutions, to assess the capacity building needs of a waste water management system for the Municipality.
2. Construction of two sewage pumping stations and a waste water network. The estimated length of the proposed network is about 20 km with an average diameter of 10 inches.

Cross-Border Impact:

This project aims to reduce pollution of the Coastal Aquifer and the Mediterranean marine life, an important source of ground water and marine resources for both Israelis and Palestinians.

Figure 1: Location Map of Abasan

Estimated Budget: 3,500,000 USD

5 INCREASING AGRICULTURAL PRODUCTION AND ENHANCING ECONOMIC OPPORTUNITIES FOR BATTIR AND THE WEST BETHLEHEM VILLAGES

Partnering Communities:

West Bethlehem Villages, Palestine: Situated west of Bethlehem, the five villages of Battir, Husan, Nahhalin, Wadi Fukin, and Wallajeh are home to approximately 25,000 residents.

Mateh Yehuda Regional Council, Israel: Located in the Judean / Jerusalem Hills, the Regional Council is home to over 40,000 residents living in 57 communities.

Shared Waters:

West Bethlehem Villages and the Mateh Yehuda RC share the Mountain Aquifer, a principle water source for both Israelis and Palestinians. The hillsides' springs have been providing the foundation for the traditional cultivation of olive groves, vineyards, fruit trees, and vegetables in the area for generations.

Problem Statement:

Presently, the farmers of Battir do not enjoy the full potential of their lands due to outmoded and time consuming agricultural techniques such as the use of farm animals to plow and till their lands.

Background Issues Relevant to the Priority:

West Bethlehem Villages are situated in the midst of an ancient agricultural landscape. The historic stonewall terraces and unique irrigation system date back to the Roman Era. Battir and its surroundings are evidence of 4000 years of terraced cultivation of grapes and olives. Farmers rely on seven abundant natural springs for irrigation water for their crops. These waters are being managed as a cooperative by the eight main extended families of Battir.

Several organizations are making collaborated efforts to preserve the landscape. Among these efforts are those of FoEME to have Battir submitted for nomination as a World Heritage Site. Since the establishment of its Eco-Museum in 2010, Battir has been seeing an increase in tourism and international acclaim, having won the 2011 Melina Mercouri International Prize for the Safeguarding and Management of Cultural Landscapes (UNESCO Greece). Battir is also part of a larger area (Land of Olives and Vines) included in the Inventory of Cultural and Natural Heritage Sites of Potential, Outstanding Universal Value issued by the Ministry of Tourism and Antiques. The Village was known in the past as the "Vegetable Basket of Jerusalem", providing Jerusalem and the neighboring villages with abundant produce. Residents had a thriving and rich economy that relied entirely on trade between Jerusalem, Jaffa, Battir and the other villages.

During 2013 FoEME worked very closely with residential and municipal village councils of both the Palestinian and Israeli neighboring communities, and approached all relevant authorities in Palestine and Israel, to halt the building of the Separation Barrier in order to defend the heritage and livelihood values of the Battir Village's agricultural terraces. This collaboration culminated in a joint petition to the Israeli High Court by both the Village and the organization, with the court ordering the suspension of construction and requiring that the IDF propose an alternative to the planned barrier.

Priority Initiative:

ncrease the area's agricultural capacity by providing local farmers with tools and knowledge needed in order to realize the full potential of their lands. This would be done in close cooperation with the Joint Service Council of Palestine, the Village Council, and the councils of other villages.

Objectives:

1. Increase crop production in local fields and boost the area's economy, both as a result of enhanced agricultural production and agricultural tourism
2. Prevent the risk of seizure of uncultivated land by the Israeli Authorities

Project Characteristics:

1. Provide the Battir Village Council with two tractors at no cost during the first year.
2. Establish a marketplace in Battir to attract agricultural tourism and introduce a new trade to the village and surrounding communities.
3. Collaboration between FoEME and the Joint Service Council of Palestine, the Village Council, and the councils of other villages.
4. A percentage of the profits from all ventures will be reinvested in future projects in Battir.

Cross-Border Impact:

The establishment of a marketplace in Battir would benefit the village's neighboring Palestinian communities, while also serving as an attraction for Israeli communities across the border looking for fine agricultural produce and local culinary experiences. A weekend marketplace will enhance local as well as cross-border tourism to the area. Such settings have the potential to increase tolerance between Palestinians and Israelis.

Estimated Budget: 300,000 USD

Figure 1: Location map of Battir valley with the Roman water distribution system

Figure 2: Battir Valley

6 REHABILITATION OF FASAYEL'S SPRINGS

Source of Fasayel spring

stream flow of the spring

pipe of the spring

Partnering Communities:

Fasayel, Palestine: The Palestinian village is located in the Jericho Governorate, 23 km north-east of the City of Jericho, and is home to 1,132 residents.

Beit She'an, Israel: The city is located in the Jordan Valley and is home to 18,000 residents.

Sharhabil bin Hassnah, Jordan: Situated on the east bank of the Jordan River, with a population of approximately 32,000 residents.

Shared Waters:

Fasayel is located in the Jordan Valley where natural springs from the Eastern Basin of the Mountain Aquifer flow. Large collection ponds and water aqueducts from the Roman Period provide evidence of how much water once flowed in these springs. The Fasayel Spring is a main source of water for the local farmers, both for irrigation and for their livestock.

Problem Statement:

The Fasayel Spring has been depleted due to over-pumping by deep wells of illegal Israeli settlements around the village. What little is left for local agricultural use is ineffectively utilized due to a disintegrating irrigation system. As a result, little of the surrounding agricultural lands are presently being cultivated. Furthermore, the catchment source of the spring is not being maintained, allowing human and animal waste to accumulate in the area.

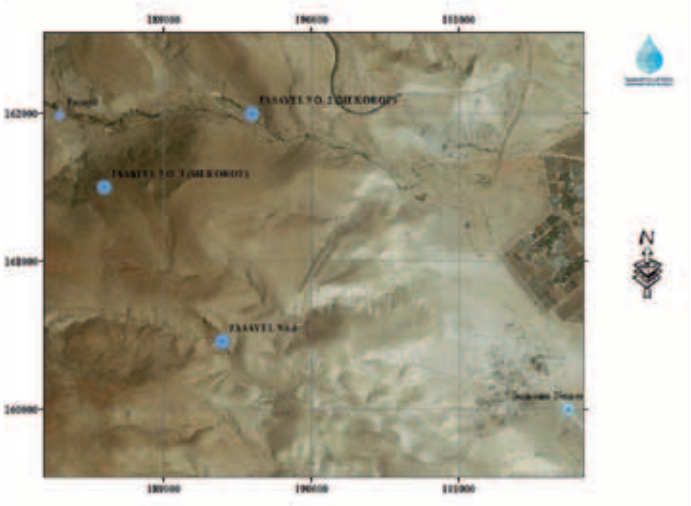
Priority Initative:

Rehabilitate and maintain the Fasayel Spring and the village's irrigation system, including the creation of a protection zone around the source of the spring and replacement of parts of the irrigation infrastructure.

Background Issues Relevant to the Priority:

Natural springs can be used as significant water sources in the West Bank. However, most of them, particularly those that flow in remote areas, are not utilized efficiently. Many of them are abandoned and in need of rehabilitation.

The Fasayel Spring branches out into three different streams, and water is delivered from each of them by a pipe into a collection pond. From each pond a canal delivers the water until it meets the other two canals. The water then flows into a main pipeline delivering it to a Roman collection pond, from where it is pumped to use for irrigation. This infrastructure is not being maintained and is disintegrating, resulting in loss of water due to leakage.



Location map of Fasayel spring

Objectives:

1. Control the quality of water used for irrigation
2. Optimize the use of the Fasayel Spring by local residents

Project Characteristics:

1. Rehabilitate the spring and create a protection zone to prevent pollution
2. Replace the main pipeline that delivers water from the three branches of the Spring
3. Rehabilitate and maintain the open canals and the Roma irrigation system in the area

Cross-Border Impact:

The rehabilitation of the Fasayel Spring will contribute to the livelihood of this rural community. Together, projects such as this will increase the efficiency of the agricultural sector in the Jordan Valley and reduce the tension between Israel and Palestine over the allocation of shared waters.

Estimated Budget: 250,000 USD

7 REHABILITATION OF THE SEWAGE NETWORK IN TULKAREM AND CONSTRUCTION OF A NEW NETWORK IN UNSERVED AREAS OF THE CITY

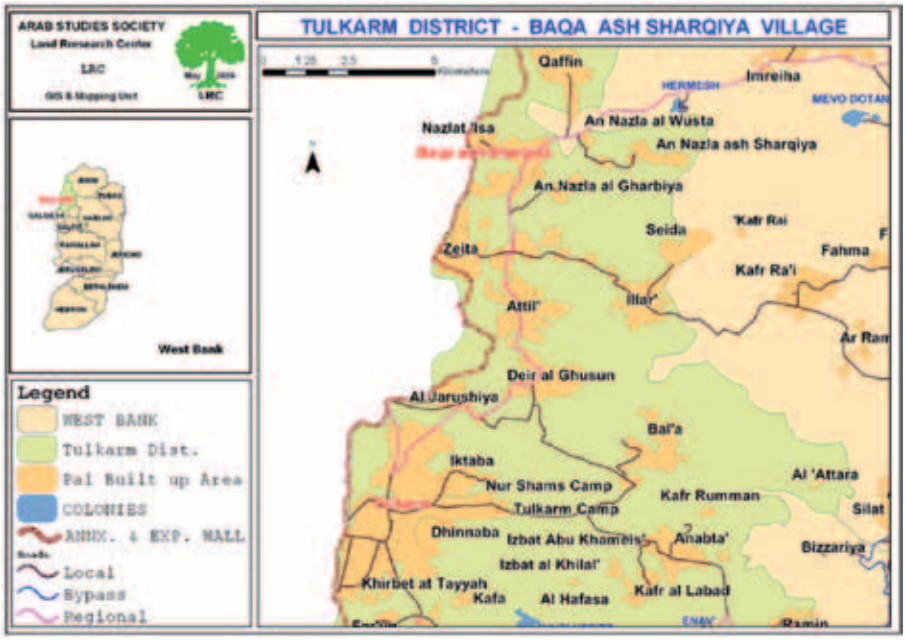


Figure 1: Location Map of Tulkarem

Problem Statement:

A large part of the sewage system in the city center of Tulkarem is damaged, with blocked sewage pipes and leakage that pollutes nearby wells. Since many of these wells supply fresh water from shallow parts of the aquifer, leakage from the sewage system is likely to contaminate ground water, posing a serious threat to public health. In other parts of the city, cesspits are still used and further contaminate ground water in the area.

Priority Initiative:

Rehabilitation of the sewage network in the city center of Tulkarem and construction of a new network in unserved areas of the city.

Partnering Communities:

Tulkarem, Palestine: The northern West Bank city of Tulkarem is home to 80,000 residents, living in the City and in the surrounding villages of Shweikah, Thenabah, Irtah, and the Tulkarem Refugee Camp.

Emek Hefer Regional Council, Israel: Spreading over an area of 130,000 dunums (about 32,500 acres) in central Israel, Emek Hefer Regional Council is home to 38,000 residents, living in 44 communities.

Shared Waters:

The partnering communities of Emek Hefer Regional Council and the district of Tulkarem are located directly along the Green Line and the physical Separation Barrier. Despite these divisions, they nevertheless share a number of water sources. Both communities are located over the western basin of the Mountain Aquifer, a key source of drinking water for both Israelis and Palestinians. Historically, the Alexander stream and its tributaries, the Zomar stream and the Teen/Teenim stream, originate eastward in the West Bank near the city of Nablus, and then flow through the Tulkarem district and across the Green Line into the Emek Hefer Regional Council. In Emek Hefer all the tributaries meet and flow westward to the Mediterranean Sea. While these channels still exist, the situation of flow in the stream beds is different today. Most of the flow crossing the Green Line from Palestine consists of wastewater and is captured at Yad Hana WWTP. There it is treated and most of the treated effluent is reused for irrigation. During periods of winter rainfall, water flows in the stream to the Mediterranean. In summer, the period during which the natural state of the stream is dry, the flow consists primarily of treated effluent released from the WWTP because its salinity is too high for reuse in irrigation.

Background Issues Relevant to the Priority:

The Municipality of Tulkarem has implemented several small projects to solve parts of the existing problem and to deliver waste water to treatment ponds, but all these efforts were not sufficient to solve the problem and need to be further developed in order to fully cover the most problematic areas.

The existing sewage network is used for both rainfall and waste water drainage, a double function that increase the problem of blockings in the system. Pollution of ground water has been reaching worrying levels over the past few years, forcing the Municipality to stop pumping water from these wells for different periods each time.

Objectives:

1. Decrease pollution to ground water in Tulkarem
2. Protect and improve public health in the area
3. Reduce the Municipality's costs from the disinfection of fresh water

Project Characteristics:

Laying of unplasticized polyvinyl chloride (uPVC) sewer pipelines with diameters of 8 inches, 10 inches, and 12 inches for main and subsidiary lines.

Cross-Border Impact:

The Mountain Aquifer over which Tulkarem is situated is a main water source for both Israelis and Palestinians. Rehabilitating waste water infrastructure in communities such as Tulkarem will therefore improve the quality of water used by both.

Estimated Budget: 500,000 USD

8 REHABILITATION OF THE FRESH WATER SUPPLY NETWORK IN YATTA

Figure 1: FoEME staff & reduced water supply

Partnering Communities:

Yatta (Hebron Governorate), Palestine: Yatta is located in the southern West Bank, 12 km south of Hebron, and is home to over 100,000 residents.

Eshkol Regional Council, Israel: Eshkol RC is situated in the north-western Negev Desert and has 13,000 residents living in 31 communities. It is one of the largest regional councils in Israel with over 760,000 dunams ranging from the west side of Be'er Sheva to the Gaza Strip.

Shared Waters:

Yatta is one of the Palestinian communities located over the Mountain Aquifer. The Hebron Stream flows through Yatta and then continues downwards, across the Green Line, to merge with the Be'ersheba Stream in Israel that merges with the Besor Stream before flowing into Wadi Gaza and the Mediterranean Sea.

Problem Statement:

The city has seven water storage reservoirs with a total capacity of 7,700 m3 of water. Per capita water availability per day is 20 liters according to the estimation of the municipality of Yatta. This is significantly less than the standard level recommended by the World Health Organization of 80-90 liters per person per day. For the size of the population which reaches more than 100,000, the shortage of water amounts to about 4250 m3. In addition, population growth has been increasing the demand for water. Yatta's fresh water network is dilapidated and cannot meet this increasing demand. Furthermore, the poor condition of the infrastructure has been leading to the loss of water due to leakage, as well as water pollution as a result of poor sanitation (mainly the use of cesspits).

Priority Initiative:

Rehabilitation and improvement of the fresh water supply and distribution networks

Background Issues Relevant to the Priority:

FoEME has been working very closely with the Yatta Municipality for several years, as part of the GWN project, to seek solutions to the pollution of the Hebron Stream due to domestic and industrial waste water flowing from the city of Hebron. In addition, FoEME has now identified the need to rehabilitate the local water system and increase its ability to meet the population's water demand. However, increasing water supply will lead to an increase in waste water generation. Hence water and sanitation solutions should be reached in parallel.

Project Characteristics

1. Water System: Replace 5 km of pipelines to pipes with a diameter of 4 inch rather than the current 2 inch pipes.
2. Sewage System: Design and install a sewage system for the city and connect to Hebron wastewater treatment plant planned by the World Bank.

Objectives :

1. Increase water availability in the Municipality by reducing leakage from the water system
2. Improve sanitation by constructing a sewage system that prevents discharge of raw sewage to the Hebron Stream, the flow of raw sewage across the Green Line and into Gaza, and the pollution of ground water

Cross-Border Impact:

Projects designed to increase water supply to communities in dire need for fresh can potentially reduce tensions between Israel and Palestine over water allocation. The sewage system will prevent the flow of sewage downstream to the neighboring Israeli communities on the other side of the Green Line.

Estimated Budget for the rehabilitation of the water system: 754,000 USD

Estimated Budget for the Sewage System: 20 million USD

1 STABILIZING THE DEAD SEA THROUGH ADVANCING A COMBINATION OF ALTERNATIVE MEASURES

Partnering Communities:

Tamar Regional Council, Israel: Situated along the Dead Sea, Tamar RC is one of the largest regional councils in Israel (1,650,000 dunams) but has the smallest population (1,300 residents), residing mainly in the four communities of Ein Gedi, Tamar, Neot HaKikar, and Neve Zohar.

South Ghour Municipality, Jordan: Located in the Jordan valley along the Dead Sea and home to approximately 50,000 residents in three rural communities (Gour Safi, Gour Mizre, and Gour Fifa), South Ghour is situated some 350 meters below sea level.

Jericho, Palestine: Jericho lies 250 meters below sea level and is therefore the lowest city in the world. It is home to approximately 40,000 residents.

South Shouna, Jordan: The district of Southern Shouna is situated in the Ghour area with a population of over 43,000 residents.

Shared Waters:

Lying in the heart of the Syrian-African rift valley at the southern outlet of the Jordan River, the Dead Sea region is internationally known for its geological, historical and biological characteristics. Lying at the lowest spot on earth, the waters of the Dead Sea are prized for their therapeutic value and for their minerals. The basin's cultural heritage includes the ancient city of Jericho, and the archeological sites Masada and the Qumran caves. Its natural assets include the exquisite natural beauty of stark, pristine desert landscapes and flowing springs and oases that provide habitat to nearly 600 species of plants and animals. The Dead Sea is a sight for sore eyes in the desert, an oasis of blue in an otherwise brown landscape. For the GWN communities of Tamar Regional Council, Jericho and South Ghour, this body of water provides a sense of place and identity. For Israel and Jordan the Dead Sea area presents many economic opportunities that Palestinians too have the right to benefit from.

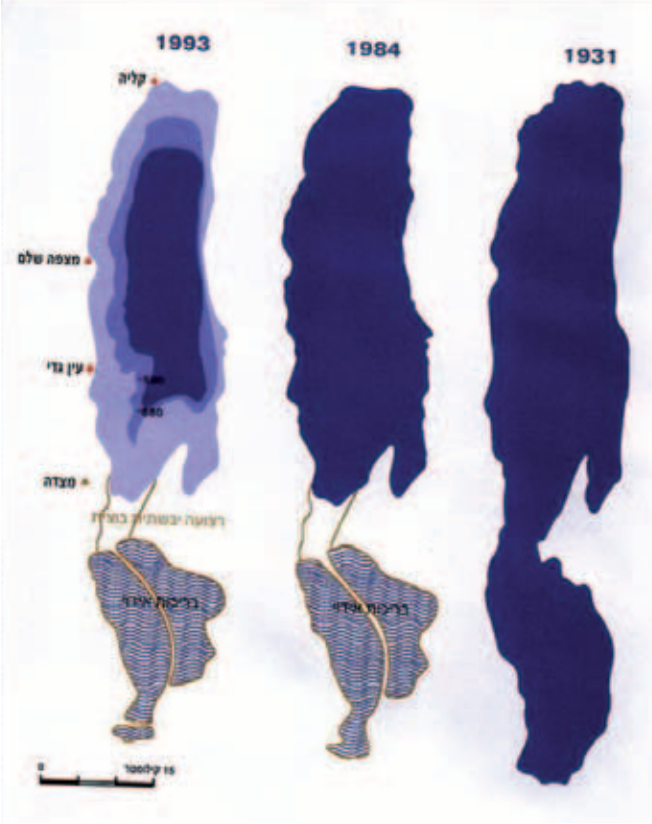


Figure 1: Shrinking of the Dead Sea

Problem Statement:

Regrettably, the future of the Dead Sea for local and global populations to enjoy is under severe threat resulting from a process of accelerated drying due to human activities over the past 50 years. The Dead Sea has already lost over 1/3 of its surface area and continues to drop by over 1 meter per year. The shoreline in expected to drop from -411 meters to -430 meters by the year 2020. The primary threat to the Dead Sea results from upstream diversions of waters that feed the Dead Sea. The Dead Sea's primary source of water, the Jordan River, suffers from diversion, pollution, and inappropriate development. Of the 1.3 billion cubic meters of water that historically flowed down the Lower Jordan River (LJR), approximately 96% has been diverted by the national authorities of Israel, Syria, and Jordan. Of the little waters that still flow into the Dead Sea, large amounts are being utilized unsustainably by Israeli and Jordanian Dead Sea industries that extract valuable minerals such as potash, bromine, and phosphates through intensive evaporation methods. Industrial solar evaporation ponds are responsible for 30-40% of the total evaporation of Dead Sea waters. The annual water deficit of the Dead Sea is estimated at 700 million cubic meters (mcm), of which the annual industry share (both Israeli and Jordanian) is estimated to be 330 mcm of water loss through evaporation annually. The Israeli and Jordanian governments are promoting the linking of the Red Sea and the Dead Sea with the Red Dead Conveyance. FoEME is of the opinion, supported by World Bank studies, that the project is a white elephant.

Priority Initiative:

Stabilize the Dead Sea through the promotion of a Combination of Alternatives (CoA) to the Red Sea – Dead Sea Water Conveyance (Red-Dead Conduit - RDC).

Background Issues Relevant to the Priority:

The governments of our region (Israeli, Jordanian and Palestinian) have been discussing the possibility of linking the Red Sea with the Dead Sea since 2002. In the more than 10 years that have passed, the World Bank, at the request of our governments, and at a cost of US$16.5 million, has undertaken studies to answer 3 declared objectives of the project:

- Save the Dead Sea from environmental degradation
- Desalinate water and/or generate hydro-electricity at affordable prices in Jordan,Israel and the PA
- Build a symbol of peace and cooperation in the Middle East.

The World Bank Study of Alternatives, commissioned initially contrary to the wishes of our respective governments, compares the RDC proposal with some 20 alternatives or combination of alternatives as regards their meeting the stated objectives of the project. In comparison with the 16 million US dollars spent on the study for the RDC, only 500,000 US dollars was spent on the Study of Alternatives. In addition, there was very little time given to the Study of Alternatives. The Study compares the RDC with the possibility to rehabilitate the LJR, other conduits proposed from the Mediterranean Sea to the Dead Sea, import of water from Turkey and elsewhere, Mediterranean and Aqaba coast desalination options, water conservation options and technical changes to mineral extraction. On page xxxii of the Study of Alternatives the authors speak to the advantages of an incremental approach that combines several alternatives. The Study of Alternatives in Table ES.3 page xlix (CA1) identifies the combination of alternatives as the only option where all objectives are realized combined with both positive environmental and social benefits.

In comparing the analysis of the Feasibility Study with the Study of Alternatives, FoEME believes that the recommended path for our own governments to take, Jordanian, Israeli and Palestinian, and for the international community to support, is to reject the Red Dead Conduit option and support the Combination of Alternatives that builds on the local experience developed in the region over this last decade. The World Bank's Study of Alternatives has stated for the first time what FoEME has been advocating for over a decade; that the LJR can be rehabilitated, the Dead Sea stabilized, and sufficient water made available to our respective publics without the risk of undertaking an experiment that constitutes 'playing God' by mixing two seas, leading to likely irreversible damage to the environment and the political instability of unparalleled public debt.

Figure 2: Dead Sea Works factories that, together with their Jordanian counterparts (Arab Potash Company), are responsible for close to 50% of water loss from the Dead Sea

Unlike any other water source in the region where consumers (in industry, agriculture or individuals) pay for the water that they consume, mineral extraction companies are able to freely pump water out of the Dead Sea and into evaporation ponds without the need to pay any fees. There is also no public monitoring of water quantities withdrawn or need for a water license. While both Dead Sea Works (DSW) and Arab Potash Company (APC) do pay a royalty for the minerals they extract, they have no incentive to conserve water as they extract those minerals, given that they have unlimited Dead Sea water access free of charge. On the contrary, the faster the rate of evaporation and production, the greater the profit margin for Dead Sea industries. This situation enables the industries to externalize the environmental costs of their operation which encourages further demise of the Dead Sea ecosystem.

In 2013 the Israel Water Authority began, for the first time, to pump water regularly from the Sea of Galilee (Lake Kinneret) into the southern Jordan River in an effort to ecologically rehabilitate the river. The project will enable the discharge of approximately 1,000 cubic meters of water per hour, with the ultimate goal of replenishing the Jordan with 30 million cubic meters per year. The current rate will contribute to an addition 9 mcm of flow in the LJR.

Objectives:

- Raise public awareness about the existence of alternatives at a lower cost, with greater benefits
- Educate decision makers about the existence of alternatives at a lower cost, with greater benefits
- Further research into the CoA study's Different combination options

Project Characteristics:

- 70 mcm desalination in Aqaba, of which 20 mcm to Aqaba and 50 mcm to Eilat, in exchange for 50 mcm additional from the Sea of Galilee to Amman via the King Abdullah Canal
- Additional Sea of Galilee water to Amman via King Abdullah Canal
- Improved water recycling and conservation: 400-600 mcm to the LJR
- LJR salinity reduced to no more than 750 milligram per liter (mg/L)
- At least one flood event should be allowed per year with a discharge of approximately 20-50 m3/s lasting at least 24 hours, totaling to some 4 MCM
- Israel should be responsible for returning 54% or 220 MCM of the minimum 400 MCM, Syria 24% or 100 MCM and Jordan 90 MCM at 22%
- 350 mcm less evaporation at Dead Sea Industries through improved technologies
- Water sharing agreement with the Palestinians

Cross-Border Impact:

The Dead Sea is recognized worldwide as a unique site with outstanding significance for health, history, industry, and culture. Without reversing the root causes for the demise of the sea, future generations of Jordanians, Israelis and Palestinians will not have the opportunity to enjoy this precious resource. The management of the Dead Sea cannot be properly understood outside of its political context. The basin is shared by three peoples - Jordanians, Israelis, and Palestinians - and administrative management is split not only among three governments, which often have strained relations between them, but also among dozens of governmental agencies with competing interests. Thus, effective management needs not only to overcome differences between sectors, but both between and within governments as well. Solutions to the shrinking of the Dead Sea need to be regional in their focus and present the most affordable and beneficial options, both from an environmental and economic perspective.

2 REHABILITATING THE LOWER JORDAN RIVER

Figure 1: Fish ponds in the Jordan Valley, Israel

Partnering Communities:

Israeli communities of the Lower Jordan River (LJR) - Jordan Valley Regional Council, Beit Shean Municipality and the Spring Valley Regional Council: Home to approximately 40,000 residents living in 44 rural communities and the city of Beit Shean, around the Sea of Galilee and in the LJR Valley.

Palestinian communities of the LJR – Fasayel, Auja and Jericho: Home to approximately 47,000 residents living in the villages of Fasayel and Al Auja and the city of Jericho on the West Bank of the LJR Valley.

Jordanian communities of the LJR - Muaz Bin Jabal Municipality, Tabket Fahel, Sharhabil bin Hassnah, Deir Allah and South Shouna: Home to 185,000 residents in clusters of towns and villages along the eastern bank of the LJR Valley.

Shared Waters:

The LJR starts at the southern most point of the Sea of Galilee (Lake Kinneret) and flows along some 100 km down to the Dead Sea. The LJR is shared among the nations of Israel, Jordan and Palestine. The River flowed freely for thousands of years from the Sea of Galilee to the Dead Sea creating a lush wetland ecosystem, rich in biodiversity. This narrow corridor also serves as one of the most important migratory flyways on the planet. The river has been immortalized in the holy books of Judaism, Christianity and Islam. Unlike any other river on earth, the LJR remains an important cultural anchor for half of the world's population. An estimated 96% of its historical flow of some 1.3 billion cubic meters per year has been diverted by Israel, Syria and Jordan. Though still unique in its natural and cultural wealth the "Mighty Jordan" has been reduced to a trickle south of the Sea of Galilee - devastated by over-exploitation, pollution, and a lack of regional management.

Problem Statement:

Increased salinity is the primary water quality challenge in the LJR. This increased salinity, among other factors, has been responsible for a 50% loss of the River's biodiversity. The dramatic reduction of freshwater inputs from the Sea of Galilee and the Yarmouk River coupled with the diversion of saline springs into the LJR has created higher than natural saline conditions. Additional factors contributing to the increased salinity are the flow of fish farms effluents into the LJR, drainage and seepage into the LJR of groundwater from saline springs in the Jordan Valley and the Spring Valley.

Priority Initiative:

Ensure a maximum salinity of no more than 750 milligram per liter (mg/L) in the Lower Jordan River, as part of the larger plan of rehabilitating the LJR and restoring ecological integrity and biodiversity to the River.

Background Issues Relevant to the Priority:

In 1967 a by-pass to the Sea of Galilee, called the Saline Water Carrier (SWC), was constructed to improve water quality in the Sea of Galilee by diverting saline springs, which once flowed into the Sea of Galilee, to the LJR at Alumot Dam. Still operational, it heavily influences the LJR, as south of Alumot dam 60-90% of the LJR's effluent comes from the SWC. Its waters originate at two saline springs to the west of the lake - Tabgha Spring and the Tiberias Hot Springs. The saltiest spot in the Upper LJR is the mouth of the SWC, with an average of more than 2,000 mg/L and typically, salinity levels decline southwards down to a level of 1,500 mg/L at the LJR's confluence with Bezeq Stream. In October-February however, owing to discharges from fish farms, salinity increases below Harod Stream and via Emeq Hamaayanot.

FoEME's Towards a Living Jordan River: An Environmental Flows Report on the Rehabilitation of the Lower Jordan concludes that rehabilitating the LJR requires 400 MCM/Yr (less than a third of the historical flow), to be expanded to 600 MCM over time. The river's salinity should be reduced to no more than 750 milligram per liter (mg/L), meaning that primarily fresh water needs to be returned to the river with only the highest quality of effluents allowed (with effluents constituting no more than 25% of the LJR's base flow).

FoEME's Roadmap for the Rehabilitation of the Lower Jordan River (prepared by DHV MED), outlines the Zero Scenario (ZS) or Business as Usual, demonstrating the state of affairs until 2041 if no action is taken to reinstate water into the LJR, on top of already approved plans. Among already approved plans is the construction of a desalination plant at Bitanya that will desalinate the highly saline waters channeled to the LJR via the SWC. Construction of the plant is expected to be complete by 2015. Another saline spring that today still flows to the Sea of Galilee from the north-west is the Foliya, which will be diverted to the SWC once this desalination plant is operational.

Impacts of the desalination project relevant for this Priority Initiative are: the Bitanya desalination plant will desalinate 9 MCM/Yr from the SWC, the brine from which will be combined with what saline water remains from the Tabgha Spring, Tiberias Hot Springs and Foliya Spring brines, and diverted to the fish ponds in the Spring Valley Regional Council.

An impending reform of the fishery sector would require higher standards of water quality in fish farms discharge/ drainage; and would limit the discharge period to the three months between October 15th and January 15th. However, while the timing of the discharge each year represents a compromise with the fishery sector's need for an early discharge, it means that fish farms output would reach the Harod and LJR prior to winter flows, when the stream flow is at its lowest. Consequently, the level of salinity in both the Harod and the LJR in October/November is expected to increase dramatically as a result of this reform, jeopardizing ecological restoration.

The ZS, which includes the interventions mentioned above shows that salinity will somewhat improve, especially upstream of Harod Stream. Nevertheless, salinity will still be higher than the goal of 750 mg/L, throughout the length of the LJR downstream of Alumot.

Figure 2: Salinity in the Lower Jordan River

Objectives:

1. Advocate for / leverage investment in a pipeline to carry brine from Bitaniya desalination plant to the Dead Sea.
2. Advocate for the passing of the fish farming reform, with adjustments that take into account salinity concerns.

Project Characteristics:

· Educate decision makers about the importance of ensuring a maximum salinity of no more than 750 milligram per liter (mg/L) in the Lower Jordan River and how current plans for the region endanger this prospect.
· Hold meetings with stakeholders to communicate and raise support for the FoEME advocated position on salinity in the LJR.
· Identify and facilitate partnership with international investors for brine pipeline project.

Cross-Border Impact:

The Jordan River is a shared resource. Its rehabilitation and the sustainable management of the resource can serve as a model for transboundary cooperation and as a precedent for economic benefits that can be derived from its rehabilitation and tourism development.

3 PROMOTING REGIONAL EDUCATIONAL PERSPECTIVES ON THE DEMISE OF THE DEAD SEA AND JORDAN RIVER SYSTEM

Figure 1: Eco-building at the Ein Gedi EcoCenter

Partnering Communities:

Israeli communities of the Jordan Valley and Dead Sea Region (Lower Jordan River - LJR): Jordan Valley Regional Council, Beit She'an Municipality, Spring Valley Regional Council, Tamar Regional Council: Home to approximately 42,000 residents living in 47 rural communities and the city of Beit She'an, around the Sea of Galilee, in the Jordan Valley and around the Dead Sea.

Palestinian communities of the Jordan Valley and Dead Sea Region – Fasayel, Auja, and Jericho: Home to approximately 47,000 residents living in the villages of Fasayel and Auja and the city of Jericho on the West Bank of the LJR.

Jordanian communities of the LJR - Muaz Bin Jabal Municipality, Tabket Fahel, Sharhabil bin Hassnah, Deir Allah, South Shouna and the South Ghour Municipality: Home to 235,000 residents in clusters of towns and villages the length of the Jordan Valley and around the Dead Sea.

Shared Waters:

Kibbutz Ein Gedi in the Tamar RC, is situated on the western shore of the Dead Sea located on the edge of the Judean Desert at the site of historic Ein Gedi. The Dead Sea is a sight for sore eyes in the desert, an oasis of blue in an otherwise brown landscape. For the GWN communities of the Dead Sea Region, this body of water provides a sense of place and identity. For Israel and Jordan the Dead Sea area presents many economic opportunities that Palestinians too have the right to benefit from. Worldwide, the Sea is known for its mineral rich waters and mud, as well as its significance as the lowest place on earth. Regrettably, the future of the Dead Sea for local and global populations to enjoy is under severe threat resulting from a process of accelerated drying due to human activities over the past 50 years. Today, the Dead Sea's primary source of water, the Jordan River, has been reduced to a trickle south of the Sea of Galilee - devastated by over-exploitation, pollution, and a lack of regional management. An estimated 96% of its historical flow of some 1.3 billion cubic meters per year has been diverted by Israel, Syria and Jordan. Of the little waters that still flow into the Dead Sea, large amounts are being utilized unsustainably by Israeli and Jordanian Dead Sea industries that extract valuable minerals through intensive evaporation methods.

Problem Statement:

The Middle East is one of the most water-stressed regions in the world. Natural water scarcity is exacerbated by a failure to establish effective mechanisms for joint management of trans-boundary water basins, inadequate infrastructure and poor sewage treatment. In an already volatile region, this creates a situation in which water has become an explosive political issue. All the region's major water basins are shared across political boundaries. To ensure the sustainability of water resources and to mitigate tensions that result from competition over water, cooperation is a necessity. Yet, conflict, competition, and mutual suspicion characterizes relations between the region's communities, making cooperation over shared natural resources difficult to achieve. Specific locations of cooperation, including the modeling of techniques and methodologies, like FoEME's network of Eco-Centres in Jordan, Palestine and now Israel, demonstrate that such cooperation is not only necessary and possible but mutually beneficial.

Priority Initiative:

Development of the Ein Gedi Eco-Centre as another link in the regional chain of environmental education "anchors", which highlights the demise of the Dead Sea and Jordan River, demonstrates potential solutions and shows that cooperation in tackling our shared environmental challenges is not only necessary and possible but mutually beneficial.

Background Issues Relevant to the Priority:

In line with FoEME's vision of regional cooperation to tackle shared environmental challenges and as a commitment to demonstrating practical ways to leverage cooperation and environmental stewardship to benefit communities, an outcome of the GWN project has been the development or creation of major Environmental Centres / Eco-Parks in a specific community, one in each country.

Over the years of work since 2001 in the Jordan Valley in Jordan, FoEME earned an excellent reputation with the community and with the Jordan Valley Authority (JVA), the governmental body responsible for all land and water affairs in the Jordan Valley. As a result, beginning in 2004, the JVA has donated 216 dunams for the development of an Eco-Park. After only 2 years, a rapid return of natural vegetation inside the park's area was easily identified, creating a green spot in the otherwise bleak hills of the Jordan Valley. The Eco-Park is also used today as a core demonstration area to experiment and showcase easily accessible, practical sustainable technologies and living patterns that are environmentally and culturally appropriate to the locality.

Understanding the unique potential of the area and the need for educating visitors of the importance of the site, its connection to the Jordan River and Rift Valley, and the need to both protect the nature reserve and wisely utilize scarce water reserves, FoEME developed a Jordan Rift Valley Center for Environmental Education and Eco-Tourism Development, located in Auja, with land donated by the local municipality. Established in 2009, the Environmental Center at Auja provides a focal point for environmental education activities both for the local community as well as for visitors who journey to the nearby spring.

The Tamar Regional Council and its various attractions plays host to hundreds of thousands of tourists annually. As such, there is extensive tourism infrastructure in the area, including the guesthouse at Ein Gedi, the nearby Field School and hostel, as well as many tour operators. The FoEME Ein Gedi Eco-Park plans to build on this existing infrastructure and offer an additional, alternative experience, one that is both attractive and educational, providing visitors with insights into the environmental challenges and opportunities of the region, with a focus on the demise of the Dead Sea and sustainable living.

Preliminary work towards the development of the Ein Gedi Eco-Centre as a fully-fledged member of FoEME's network of Eco-centre's has been undertaken, including;

- Successful construction of several eco-facilities on campus
- Solar cooker experiments constructed and demonstrated
- Existing campus ready for development; Visitors' center location identified and concept sketched; Project idea accepted by Kibbutz Ein Gedi, initial approval by Tamar Regional Council

Objectives:

The Ein Gedi Eco-Centre:

- Becomes a regional coordination and information center for eco-tourists, peace-tourists, and for local, national, regional and international efforts to reverse the Dead Sea's demise. Such a regional hub would impact on tens of thousands of tourists not aware of the sustainability challenges facing the region, and the alternatives proposed by FoEME.
- Becomes an education center for exhibitions, workshops, training and hands-on experience of sustainable environmental practices: wise water use, green building techniques, local medicinal herbs, solar cooking, solar energy innovations, design, hi and lo-tech innovation.
- Facilitates the collection and sharing of local environmental wisdom from residents of Israel, Jordan and Palestine around the Dead Sea area.
- Exemplifies sustainable agricultural and other desert-living techniques, preservation of local cultural legacies, and the efficacy of cross-border cooperation; reservoir of knowledge for adapting to climate change.
- Promotes peace-making by advancing cross-border cooperation between local communities and their leaderships.
- Demonstrates that local, national, and regional efforts to protect shared environmental resources produce concrete benefits, such as contributing to economic growth.

Project Characteristics:

- Advance design sketches for the centre itself, ideally for a structure employing green technologies that could acquire LEED certification
- Advance integrated plan for whole the entire Eco-Park
- Commission business and marketing plan
- Commission educational and outreach program, including exhibition in the main building
- Coordinate FoEME 's regional eco-tourism initiatives, including especially SHE and Auja Eco Centers
- Build partnerships for project implementation

Figure 2: Learning about solar cooking at the Ein Gedi EcoCenter

Cross Border Impact:

Fostering economic cooperation between nearby communities which share environmental resources creates connections between socially disparate neighbors. This activity generates motivation to cooperate and will mitigate, in part, the conflict potential of the concrete water/ environment-related challenges between the communities. Eco-tourism enterprises necessarily promote a wider level of cooperation in order to protect the shared environmental resources upon which the successful tourism enterprise is built or relies. For water resources, whether the Jordan River, the Dead Sea, the Mountain and Coastal Aquifers or cross-border streams, the basis for cooperation extends to the regional level.

Figure 3: FoEME's EcoCenters at Sharhabil bin Hassnah, Jordan and Auja, Palestine

4 TREATING WASTEWATER IN GILBOA AND SPRINGS VALLEY REGIONAL COUNCILS

Figure 1: Pollution of the Kishon/Naher al Mukataa Stream in Israel. In addition to the flow of sewage to the stream, the stream is also polluted by agricultural runoff and solid waste.

Partnering Communities:

Israeli communities of the Kishon/Naher al Muqata and Harod Streams; Gilboa Regional Council is made up of 33 villages comprising some 25,200 residents, both Jewish and Arab. Beit She'an has a population of 18,000 residents. Springs Valley Regional Council is made up of 25 villages, comprising some 12,500 residents.

Jalameh (Jenin Governorate), Palestine: The Jenin Governorate is home to approximately 256,000 residents. Jalameh itself has a population of 3,000 residents, and is adjacent to the main crossing point to Israel, known as "The Jalameh Border Crossing".

Tabket Fahel, Jordan: A medium-sized cluster of towns and villages, Tabket Fahel is home to approximately 25,000 residents. The sister city to Beit She'an called Pella, also one of the Roman Decapolis cities, is located in Tabket Fahel.

Shared Waters:

All of these communities are located on the Mountain Aquifer and share the Kishon/Naher al Muqata Stream or the Herod Stream. The first and main tributary of the Kishon/Naher al Muqata Stream flows to the north from the city of Jenin, then passes eastward under the Separation Barrier to the Israeli village of Ram On. A second, more eastern tributary - Al Kaslan/Mukebileh Canal flows from Jalameh and crosses the Separation Barrier adjacent to the Israeli village of Mokebileh. Both tributaries meet about 4 km north of the Green Line at a site called Mapal Rosh within the Gilboa RC. The Harod Stream flows for a length of 35 km, from Israel's main water divide in the west, eastwards into the Lower Jordan River (LJR), which is shared among the nations of Israel, Jordan and Palestine.

Problem Statement:

Many of the settlements in the Gilboa and Springs Valley Regional Councils are not currently connected to a wastewater treatment plant. In most cases, wastewater from these communities is directed to community level settlement ponds. Following this initial stage, effluent is disposed of to the nearest stream, resulting in contamination of surface and groundwater and damage to the ecology of the area. In the case of the Harod Stream, this process results also in the contamination of the LJR. While the Gilboa and Springs Valley Regional Councils have been making plans to resolve these problems for many years, progress has been very slow and it has been difficult to gather information about project timelines and progress.

Priority Initiative:

Playing the "watchdog" role to ensure that all the communities of the Gilboa and Springs Valley Regional Councils are connected to a Waste Water Treatment Plant that is capable of producing effluent, meeting legally mandated quality standards.

Objectives

• Ensure the connection of all communities in the Gilboa and Springs Valley Regional Councils to sewerage infrastructure and the treatment of sewage to legally required quality levels

Project Characteristics:

• Gather additional information about plans to connect communities in the Gilboa and Springs Valley Regional Councils to WWTP's

• Monitor the implementation of planned connections

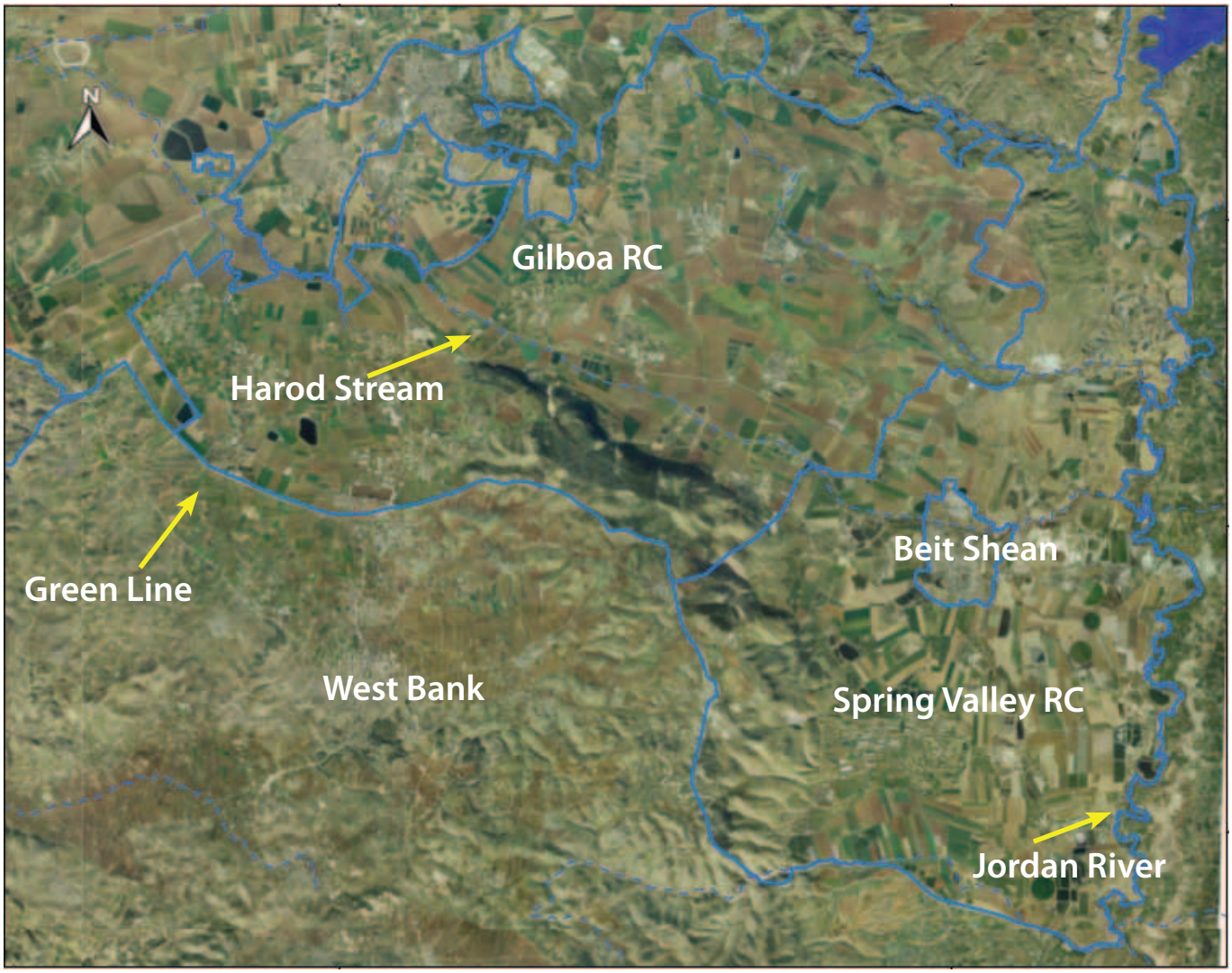


Figure 2: Map of Gilboa and Springs Valley Regional Councils and the city of Beit Shean.

• Draw attention of media, decision makers and residents to failures to comply with scheduled connection

Cross-Border Impacts:

The Kishon/Naher al Muqata Stream is a transboundary water resource shared by the Israeli and Palestinian people. Along with the Herod Stream, pollution of the Kishon/Naher al Muqata Stream threatens groundwater and contamination of the Mountain Aquifer, the main freshwater resource shared by Israelis and Palestinians. The Harod Stream is one of the main LJR tributaries. As such, the deterioration of the Harod's waters has a direct and adverse effect on the Jordan River, both in terms of quality and quantity. The rehabilitation of the LJR can only take place through a cross-border, basin integrative approach that would entail sustainable management of its sources.

5 REHABILITATION OF AUJA'S SPRING AND ITS AGRICULTURAL CANAL

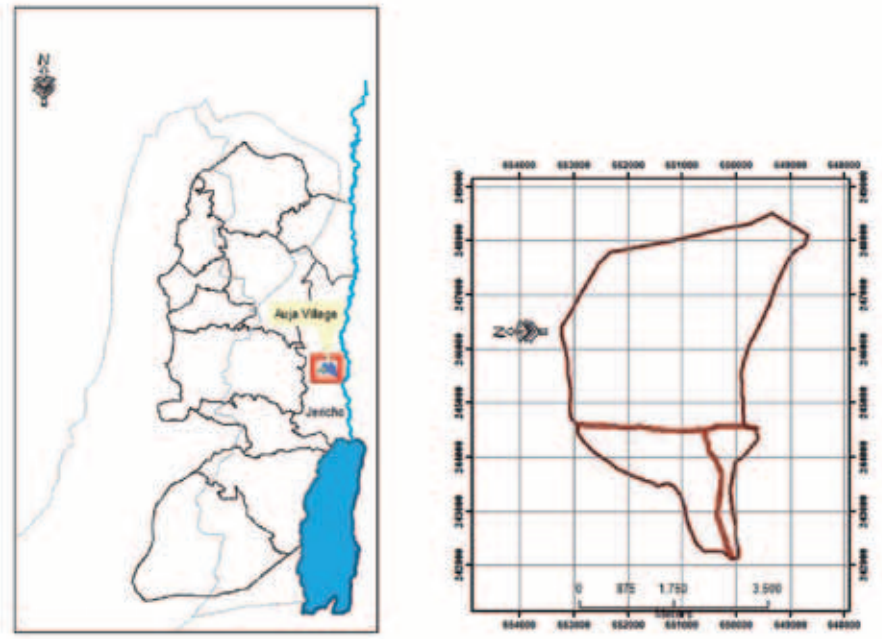


Figure 1: The location map of Auja

Partnering Communities:

Auja Village, Palestine: Auja is located 10km northeast of Jericho, in the Jordan Valley and is home to over 4,500 residents.

Deir Alla, Jordan: Situated on a main junction in the heart of the Jordan Valley, with a community approximating 60,000 residents.

Shared Waters:

The Auja spring, once a main source of irrigation for a thriving agricultural community, is part of the outflow of the Eastern Basin of the Mountain Aquifer. A concrete, open agricultural canal, now in poor condition, was built in the 1960's to deliver water from the spring to the agricultural lands.

To the east of the village lies the Jordan River. Prior to 1967 village lands extended to the waters of the Jordan, and residents used them as an additional source of irrigation. The Israeli occupation of the West Bank, beginning in 1967, has been preventing access of the villagers to the River.

Problem Statement:

Long periods of drought, as well as Israeli and Palestinian extraction of water through wells in its recharge basin, have been massively reducing the flow of the Auja spring. The agricultural canal through which the spring's water is used for irrigation has been disintegrating, and the water is polluted by solid waste and algae.

Furthermore, the residents of Auja are prevented from investing in the lands adjacent to the spring and developing recreational areas that could have yielded economic gain.

Background Issues Relevant to the Priority

The agricultural irrigation canal of Auja has been disintegrating due to poor infrastructure, thus causing severe leakage of water that could have been used for irrigation. Each winter the open canal is subject to the accumulation of post-flood debris, and the natural growth of algae in the water hinders the flow in the canal.

The Municipality, in cooperation with the Auja Canal Committee, works annually to clean the canal and repair any damages, in order to provide residents with access to its water. These efforts, however, are not sufficient. In the winter of 2012, FoEME took over the responsibility of repairing massive damage that had been caused due to the weather, as shown in the photo below.

Furthermore, despite private ownership of the lands adjacent to the Auja spring, residents are prevented from developing them, since Israel, following the Oslo Accords, declared the area a nature reserve. The village thus loses potential economic opportunities, including those that could have presented themselves by the development of recreational and touristic facilities around the spring.

Priority Initiative:

Rehabilitation of the agricultural irrigation canal through regular maintenance, that would minimize the loss of irrigation water, and the development of the area surrounding the Auja spring by installing recreational facilities.

Figure 2: Auja Agricultural Canal & Rehabilitation work

Objectives :

• Minimize the loss off irrigation water and improve agricultural livelihood

•Encourage eco-tourism in Auja and supplement household income

• Draw attention to the potential of the area

• Promote eco-tourism in the area to reduce pressure on water resources and strengthen community efforts to rehabilitate the Jordan River

Project Characteristics

• Advocate the above objectives and receive the necessary approvals from the Israeli Civil Administration and the Israeli National Parks Authority

• Raise the awareness of decision makers to the importance of the Auja Spring

• Install the necessary recreational facilities in the area of the Auja Spring, such as benches and rubbish bins, a parking area, signs, etc

Cross-Border Impact

The Village of Auja has been developing itself as an eco-tourism attraction – both for domestic and cross border tourism, particularly as a result of the establishment of an environmental center in the village by FoEME. This project will further enhance the area's attractiveness as a tourist destination.

Estimated Budget: 500,000 USD

6 CONSTRUCTION OF A SMALL SCALE WATER HARVESTING SYSTEM FOR THE AREA OF JERICHO

Partnering Communities:

Jericho, Palestine: The city lies 250 meters below sea level and is therefore the lowest city in the world. It is home to approximately 40,000 residents.

South Shouna, Jordan: The District of Southern Shouna is situated in the Ghour area with a population of over 43,000 residents.

Shared Waters:

Jericho is located in the Jordan Rift Valley, approximately 8 km west of the Jordan River and 10 km north of the Dead Sea. The average annual amount of rainfall in the area is only 150 millimeters. The entire area relies exclusively on subterranean wells and springs for domestic and agricultural uses. The spring of Ein Al-Sultan, part of the Eastern Basin of the Mountain Aquifer, is the area's main source of water. It has an output of 680 cubic meters per hour and provides a steady output throughout the year. Jericho has no access to the Jordan River and residents are often denied access to the shores of the Dead Sea.

Problem Statement:

Like most of the Jordan Valley communities, Jericho is in dire need of safe and reliable water supply for all purposes. Decrease in rainfall during the last few years in the area has been reducing ground water levels. As a result, residents heavily depend on the Ein Al-Sultan Spring, thus endangering its sustainability.

Priority Initiative:

Construction of a small scale system of water harvesting earth dams with the aim of collecting flood water from Wadi El-Qilt. This will recharge the ground water aquifer and bridge the gap between water supply and demand in the Jericho area for domestic and agricultural uses, and minimize the adverse impact of water shortage during the dry summer.

Background Issues Relevant to the Priority:

Groundwater serves as the main water supply source for communities in the Jordan Valley. In recent years, this resource has been suffering from a decline in water levels and from increasing salinity in several production wells, due to over-extraction.

This situation has motivated the Palestinian Water Authority, with the assistance of the International Community, to focus on the planning and implementation of an integrated management plan for water resources in order to effectively utilize all possible local surface (springs) and ground water.

Storm Water Harvesting (SWH) is considered a reliable technique for collecting, storing and distributing the floodwater of the major wadis during the winter season. This technique will provide an additional supply of water for the agricultural sector during the dry season. When they occur during winter, floods and intense rainfall over the Western Highlands of the Jordan Valley lead to short term surface water availability. Without the proper management of this significant additional water source, the excess rainfall is quickly lost. The Municipality of Jericho therefore intends to implement this technique in Wadi El-Qilt.

The Wadi stretches from a mountainous region in the West through the middle part of the Jericho area and reaches the Jordan Valley and Dead Sea in the East. Between 3.0-10.0 MCM of flood water flow through it in 3 months (December through February) each year. These amounts could be utilized to increase the availability and raise the quality of water in the Quaternary Aquifer, as well as provide additional irrigation water in the Jericho area, with its intensive agriculture and strained wells. Several previous studies were carried out in several locations in the West Bank in order to identify the most suitable wadis for such artificial recharge. Wadi El-Qilt was identified as the most suitable location for such recharge in the area of Jericho.

Objectives:

- Increase water level in the Quaternary Aquifer and minimize its salinity
- Provide additional water for agricultural purposes and recreational grounds in the Jericho area
- Improve and develop the integrated management of surface and ground water resources
- Improve and develop expertise of the municipality's technical staff in the most applicable artificial recharge technologies

Project Characteristics:

1. Data collection, compilation and analysis in Wadi El-Qilt
2. Conceptual design for the proposed harvesting structure
3. Implementation of the harvesting system: the system will be constructed by local contractors under the close supervision of the Palestinian Water Authority (PWA) and in coordination with the Municipality of Jericho.

Cross-Border Impact:

Projects such as this with the purpose of rehabilitating and maintaining ground water have a direct impact on the neighboring communities on the other side that share this important resource by increasing ground water seepages to the bed of the Jordan River.

Estimated Budget: 3,500,000 USD

7 AL HEMMA - OPEN CANALS

Partnering Communities:

Al Hemma, Jordan – located 40 Km north of Irbid, within the lower basin of the Yarmouk River, this village is home to approximately 2,500 residents.

Jordan Valley Regional Council, Israel - consists of approximately 11,000 residents living in 22 rural communities around the Sea of Galilee and on both sides of the Jordan River until its confluence with the Yarmouk River.

Shared Waters:

The main sources of water in Al Hemma are Ein Neen, Ein Hemma, Ein Mishouh, and Ein al Sharat springs. Water from Ein Hemma is mainly used for agriculture. It flows into an open canal known as Al Hemma canal, at a rate of 100 liters per minute. The fairly warm water, approximating 36 degrees Celsius, runs through Al Hemma before flowing into the Yarmouk River - the largest tributary of the Lower Jordan River that forms a border between Jordan and Israel.

Problem Statement:

Water flowing in open canals is highly polluted with solid waste and untreated wastewater penetrating from cesspits from nearby homes in Al Hemma. The open canals have become a health hazard for local residents and are a source of pollution for both the Yarmouk and Jordan Rivers.

Priority Initiative:

The removal of the open canal system in Al Hemma with a closed system of pipes to prevent the pollution of water flowing from Ein Al Hemma spring and reduce a health and safety hazard for local residents.

Background Issues Relevant to the Priority:

Residents in Al Hemma depend largely on agriculture and tourism as their main sources of livelihood. During the 1980's, the Jordan Valley Authority built a network of open canals in order to divert water from Ein Hemma spring to the farmers' fields. However, the open canals system has long since stopped being used for agricultural purposes, with the canals falling apart in many locations and heavily littered with domestic waste water that leaks through the unlined cesspits of the adjacent houses.

Some parts of the canals were never lined with concrete, in other parts the canals are in a state of disrepair and are slowly crumbling. The canals have become a major community public health and safety hazard, particularly since 90% of the residents that live in close proximity to the canals still use its water for bathing and other domestic purposes. Water overflowing out of the canals is damaging the foundations of nearby homes and public buildings impacting the already dilapidated infrastructure of a poverty-stricken village.

The springs around Al Hemma are well known for their therapeutic values, making the community a great candidate

Figure 1: Pulluted open canals in Al Hemma

Figure 2: Water in open canals flowing between houses in Al Hemma

Figure 3: Tour with residents and municipal staff in Al Hemma

for touristic initiatives in the Valley. Replacement of the dilapidated canal system could have noticeable impact on the development of tourism in Al Hemma, currently hindered by the enormous negative impact of the canals.

Several consultation meetings, held with the Mayor and staff of Khaled Bin Al Waleed Municipality and officials from the Jordan Valley Authority, have resulted in the establishment of a Joint Committee to assess the problem and propose solutions. The JVA has agreed to provide pipes and necessary equipment to the municipality who will allocate labor to conduct the work.

Objectives:

- Help protect the health and safety of the residents of Al Hemma.
- Prevent further deterioration of Al Hemma's infrastructure caused by leakage from the canal.
- Reduce pollutants of surface water to the Yarmouk and Jordan Rivers.

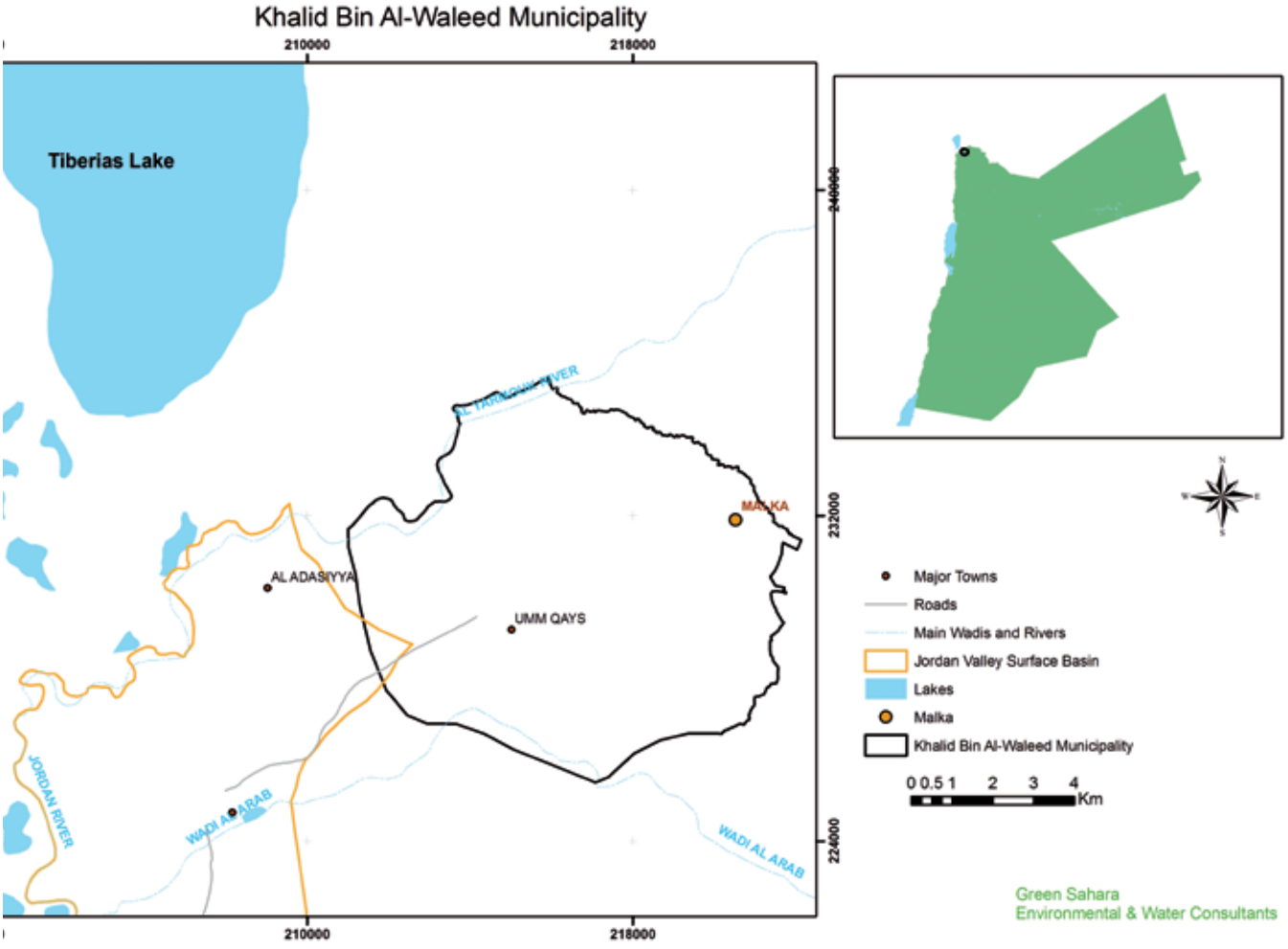


Figure 4: Khalid Bin Al-waleed Municipality by Eng. Hani Hejazi

Project Characteristics:

• Work with the Joint Committee established to advance the study needs of the community, including further development of the community's touristic potential.
• FoEME will conduct extensive awareness -raising and clean up campaigns among the residents of Al Hemma in cooperation with the local municipality.

Cross-Border Impact:

The current state of the canals is bringing pollutants, solid and liquid, to the Yarmouk River - the largest tributary of the Lower Jordan River. The removal of the canals can help reduce cross border pollution sources.

8 REHABILITATION OF DEIR ALLA DUMP SITE

Figure 1: Manual Sorting at Deir Alla Dump Site

Partnering Communities:

Deir Alla, Jordan: Situated on a main junction in the heart of the Jordan Valley, with a community approximating 60,000 residents.
Auja Village, Palestine: located 10 km northeast of Jericho City in the Jordan valley, Auja is home to approximately 5,000 residents.

Shared Waters:

Deir Alla community and Auja village are situated on the banks of the Lower Jordan River. The River is shared by Jordan, Palestine and Israel as it flows from the Sea of Galilee in a meandering 200 km southward journey to the Dead Sea. The unique river valley is presently threatened by excessive water diversion, pollution and inappropriate development with overwhelming negative impacts on the river ecosystems and livelihood of the adjacent communities.

Problem Statement:

Currently, five municipalities in the Jordan Valley including Deir Alla utilize an unsanitary dumpsite to dispose of all types of solid waste, including mixed domestic, packaging and medical waste. Located 2 km to the east of the Jordan River on the eastern bank, the east dumpsite carries approximately 160 tons of waste, buried at this landfill on a daily basis according to the reports of the joint services council of Middle Ghor.

This extremely primitive landfill causes serious pollution of the Jordan River by leachate (liquid emitted from and passing through solid waste) runoff flowing directly to the river based on consultation with different geologists.

The poor management of the site presents a high risk to the health of residents and the environment through leachate pollution, spread of vector borne diseases and air pollution.

Priority Initiative:

To rehabilitation the Deir Alla dumpsite to become a lined sanitary landfill, with improvement of solid waste management including leachate collection, bio gas production, earth covering and waste recycling.

Objectives:

- Remove current pollutants of the Lower Jordan River.
- Improve health and environmental conditions for local residents by minimizing the risk of vector borne diseases.
- Introduce best practices of solid waste management and reuse.

Background Issues relevant to the Priority:

The dump site in Deir Alla is a landfill that uses outdated techniques and manual sorting. It covers an area of 360 m2 and receives an average amount of 180 tons per day of solid waste (mostly municipal waste) from Deir Alla municipality

and four other neighboring communities; Sharhabil Bin Hassneh, Kufranjeh, South Shuneh and Meadi.

Dustbin lorries in Deir Alla Municipality collect solid waste from waste containers distributed in the community twice a day. At the dump site, the waste is piled on a piece of land within the dump site boundaries. A contractor then sorts solid waste, manually taking reusable materials (metals and plastic), leaving organic waste (55-70%) and other unwanted materials.

The Joint Services Council - the Authority responsible for managing the dump site - initiates a bidding process for contractors who are then permitted to take reusable materials from the dump site. Usually the contractor pays around 8,000-12,000 JDs per year to the Joint Service Council for taking reusable materials.

Not only is domestic waste disposed of in the Deir Alla dump site, but also medical waste from Princess Iman Hospital, according to sightings by FoEME in a recent visit to the location (as shown in the picture).

Project Characteristics:

• FoEME will seek to draw public attention through the media to the deteriorating state of the landfill and the urgent need for its rehabilitation.
• FoEME will seek to mobilize the local community, including local schools, in this effort.
• Meetings will be held with the Ministry of Environment and the Ministry of Municipalities to better understand priorities, coordinate actions and obtain letters of support.
• FoEME will seek to leverage funding to develop a management plan with the Joint Services Council and the municipality of Deir Alla for the rehabilitation of the dump site, starting from the point of collection and ending by burring wastes.
• Emergency interventions will be considered and will include building a pool to collect and treat leachate in addition to preventing the burning of waste.

Cross-Border impact:

The fact that the landfill area of Deir Alla is very close to the banks of the Jordan River increases the likelihood that leachate is directly polluting the Jordan River. Pollution of the Jordan River is contrary to the commitments of Jordan and Israel to the peace agreement signed between the countries, and contrary to recent efforts of both countries in support of the river's rehabilitation.

Estimated Budget: 1,000,000 Euros

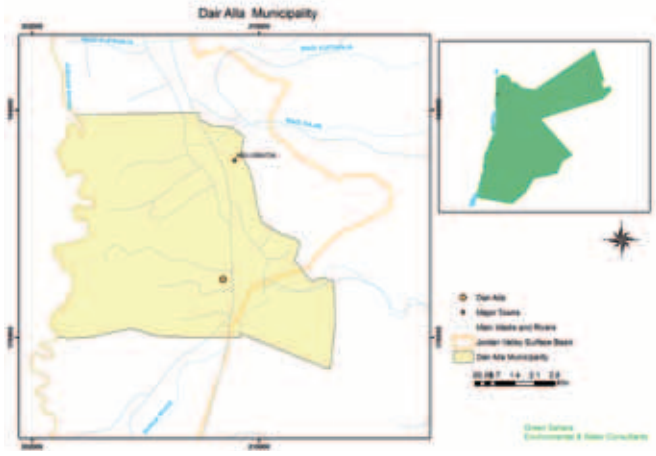


Figure 2: Deir Alla Municipality

Figure 3: Dustbin lorries emptying solid waste in the dump site

Figure 4: Finding medical waste in the dump site

Figure 5: Location of dump site, Deir Alla Municipality

9 OVERCOMING THE HOUSEFLY PROBLEM IN SOUTH GHOUR

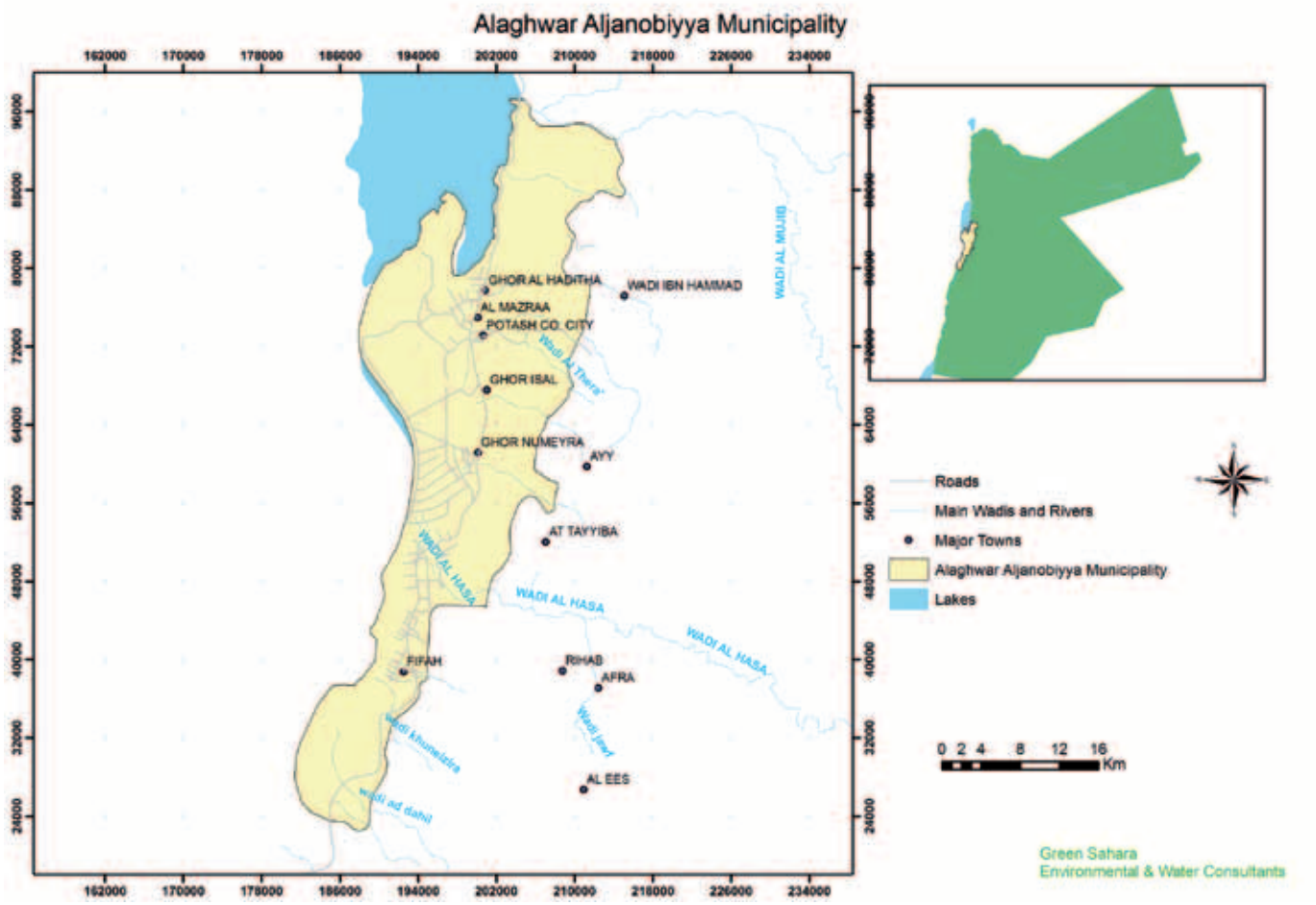


Figure 1: Alaghwar Aljanobiyya Municipality

Partnering Communities:

Tamar Regional Council, Israel: Situated along the Dead Sea, Tamar RC is one of the largest regional councils in Israel but has the smallest population (1,300 residents)

South Ghour Municipality, Jordan: Located in the Jordan Valley along the Dead Sea, the Municipality is home to approximately 50,000 residents.

Shared Waters:

The Dead Sea, commonly known as the Salt Sea, borders Jordan on the East, and Israel and the West Bank on the west. The Jordan River is the main body of water feeding the Sea, with a few additional smaller streams. It has received its name essentially due to its high mineral content, which does not allow for any marine life to survive in its water. The Dead Sea is the lowest point on Earth, 427 meters below mean sea level.

Problem Statement:

Due to the vast use of raw manure as fertilizer by the local farmers of South Ghor, the housefly has become a serious threat to public health both in the community and in the neighboring Tamar Regional Council, and a hindrance to the area's touristic development.

The economy of the Municipality is directly affected as a result: approximately 100,000 JD a year is spent on pesticides in order to reduce the problem, and potential income opportunities are lost due to the negative impact on the local tourism.

Priority Initiative:

To overcome the problem of Houseflies by introducing improved farming techniques and reducing the use of raw manure as fertilizer.

Objectives:

- Raise the awareness of farmers of the need for a long term solution to the Housefly problem.
- Improve public health by minimizing diseases carried by Houseflies.
- Enhance economic opportunities for local communities from eco-tourism development.
- Ensure the enforcement of environmental standards that would protect public health and the environment.

Background issues relevant to the priority:

Residents of South Ghour depend largely on agriculture as their main source of income. However, farmers in the

Figure 2: A farm in which raw chicken manure is used as a fertilizer

Municipality do not have access to the best and most modern farming practices and use raw chicken and cow manure as fertilizers for their crops.

The raw manure attracts houseflies, particularly during the onset of the agricultural season, around August, when it is being stored. These flies act as vectors of diseases: around 250-300 cases per month (between August and November) are diagnosed with Typhoid, Children Diarrhea and other diseases carried by Houseflies, according to the Head of the Health Department of South Ghour. Furthermore, the manure's decomposition process often leads to the infection of plants with fungi and other diseases.

Raising the awareness of farmers in South Ghour to the importance of improved farming practices, as well as the actual improvement of these practices, have always been major priorities of FoEME's. Several workshops and cross border visits between the Tamar Regional Council and the Municipality of South Ghour were organized by the organization to tackle the problems these neighboring communities face and to exchange experience and knowledge. Many previous efforts were made to eliminate this problem; all failed. The Jordan River Foundation, for example, together with Al Helal al Khaseeb Associations, established a compost factory in Deir Alla in 2008, responding to a royal decision aimed at minimizing the Housefly problem in the Jordan valley. The factory is going through serious difficulties nowadays, since farmers are not buying the compost as they still lack awareness regarding the benefits of using it rather than raw manure.

Project Characteristics:

- Work with the Ministry of Environment to advance new regulations and law- introduce fines for trucks transferring raw manure to farms.
- Develop an action plan with the Royal Department for Environment Protection (Rangers) to ensure better supervision on trucks entering the Jordan valley.
- Seek the support of the Ministry of Agriculture to hold a series of national training workshops for farmers, in order to raise their awareness of the benefits gained from using treated manure and the serious negative impacts of using it in its untreated form.
- Work with the existing Compost Factory in Deir Alla to increase its capacity and improve its current condition.
- Develop marketing venues for the Compost Factory of Deir Alla to ensure accessibility and reasonable prices to farmers in South Ghour.

Cross Border Impact:

Neighboring communities in the region face the challenges created by Houseflies. Eliminating the Housefly problem would greatly benefit these communities by improving public health and advancing the development of cross border tourism.

Estimated Budget: 50,000 Euros

Figure 3: Enormous numbers of houseflies

10 SEWAGE COLLECTION AND CESSPITS MONITORING FOR THE COMMUNITIES OF MUAZ BIN JABAL, TABKAT FAHAL AND SHARHABIL BIN HASSNAH

Partnering Communities:

Muaz Bin Jabal, Tabkat Fahal, and Sharhabil bin Hassnah, Jordan: These three communities, located on the eastern bank of the Lower Jordan River, are home to approximately 106,000 residents.

Jordan Valley Regional Council and Beit Shan, Israel: These two communities are located in North Israel and consist of approximately 11,000 and 18,000 residents respectively.

Fasayel, Palestine: Located in the Jericho Governorate, 23 Km North-East of Jericho, the village is home to 1,132 residents.

Shared Waters:

The water source shared by the communities is the Lower Jordan River. The continued decline of the River has been a major focus of FoEME due to its cultural, historical, and religious heritage.

Problem Statement:

The use of cesspits as the only waste water treatment measure in the three communities, combined with the inability to evacuate them on a regular basis due to the small number of tankers, seriously impacts the population and environment by polluting ground and surface water)particularly the Jordan River). This in turn threatens the public health due to the contamination of fresh water and diseases carried by vectors; It also prevents the development of economic opportunities for local residents, who are in dire need of them.

Background Issues Relevant to the Priority:

The three communities lack waste water collection networks, and their measures of waste water treatment are very primitive - usually a cesspit outside of each house and occasionally one cesspit shared by a few.

Each one of the three communities has only one waste water tanker to serve its population: 6,677 households in the municipality of Muaz Bin Jabal, 4,768 in Tabkat Fahal, and 7,000 in Sharhbail bin Hassnah. One tanker can only serve 6 families a day. Thus, residents are forced to wait long periods of time, sometimes up to three weeks, for their turn to dispose of their cesspits' contents. Additional tankers cannot be purchased by the municipalities due to restrictive budgets set by the highly centralized Ministry of Municipalities.
Another seemingly open option is the private evacuation of cesspits using privately owned tankers. While the evacuation by the municipalities' tankers cost 10 JD, the cost of this private service is 35 JD. Taking into consideration that the average monthly income of a family in the valley is 80 JD, the regular evacuation of cesspits is unaffordable for most households. They therefore allow sewage to seep into the ground and let it overflow. Sewage that flows in the streets as a result poses serious hazards to public health and to the environment.

Priority Initiative:

Minimize the pollution caused by untreated waste water to ground and surface water, most importantly to the Jordan River, by supplying the municipalities with one more water tanker each. This method may not be the most sustainable solution but the tankers are very much needed at this point in order to start rehabilitating the waters of the area.

Objectives:

-Prevent the pollution of ground and surface water, particularly the LJR and its tributaries.
- Increase the potential of touristic initiatives in the area.
- Minimize risks to public health caused by pollution, including vectors borne diseases.
- Reduce the financial burden on local residents forced to use expensive private services to evacuate their cesspits.

Project Characteristics:

- Leverage financing to equip each municipality with a waste water collection tanker.
- Raise the awareness of local residents in the three communities to the importance of regularly maintaining and evacuating their cesspits.
- Conduct training workshops for health inspectors in the three municipalities, with a focus on the need for a comprehensive plan for collecting sewage and monitoring cesspits.

Cross Border Impact:

The major cross border impact of the pollution caused by the poor maintenance of cesspits is the subsequent pollution of the Jordan River, shared by Jordanian, Palestinian, and Israeli communities along its banks. Better facilities, management and enforcement in the field of waste water treatment in the Jordanian communities are necessary for the rehabilitation of the polluted River.

Estimated Budget: 250,000 €

for the purpose of providing further waste water tankers and the establishment of training workshops.

Figure 1: Overflowing cesspit in Muaz Bin jabal

Figure 2: Overflowing cesspit in Tabket Fahel

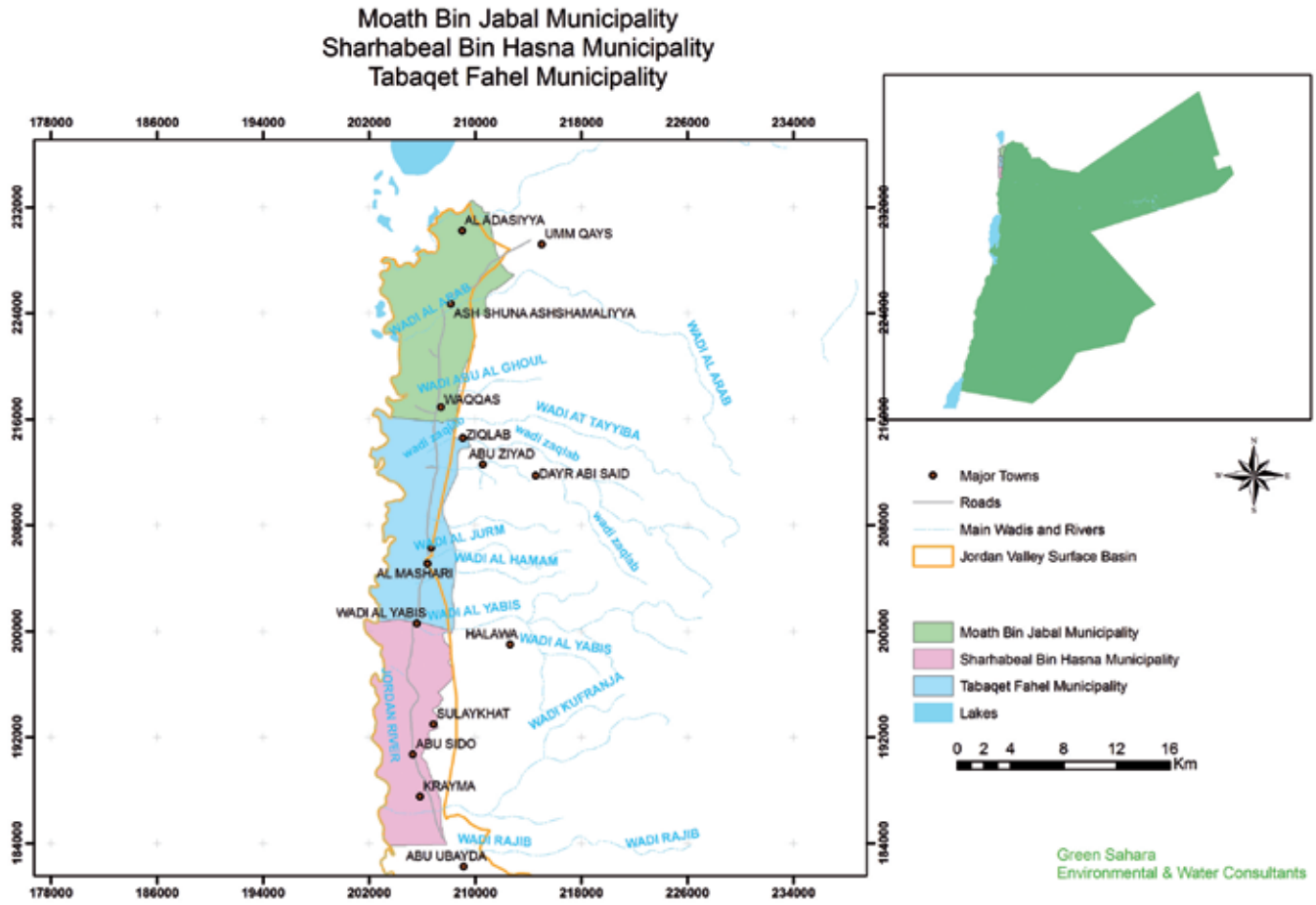


Figure 3: Three Municipalities, by Eng. Hani Hejazi

Amman Office
PO Box 840252 - Amman, 11181
Jordan
Tel: +962 6 5866602/3
Fax: +962 6 5866604
Email: info@foeme.org

Bethlehem Office
PO Box 421 – Bethlehem
Palestine
Tel: +972 2 2747948
Fax: +972 2 2745968
Email: info@foeme.org

Tel Aviv Office
90 Begin Road – Tel Aviv, 67183
Israel
Tel: +972 3 5605383
Fax: +972 3 5604693
Email: info@foeme.org

www.foeme.org