Community Based Problem Solving on Water Issues

Cross-border “Priority Initiatives”

of the Good Water Neighbors Project

November, 2016

EcoPeace Middle East
Amman, Bethlehem and Tel Aviv
Community Based Problem Solving on Water Issues

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EcoPeace Middle East 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. EcoPeace has offices in Amman, Bethlehem, and Tel-Aviv.

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**Abbreviations**

APC – Arab Potash Company  
AfD – French International Development Agency  
DSW – Dead Sea Works  
GWN – Good Water Neighbors Program  
IWA – Israel Water Authority  
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  
SIDA – Swedish International Development Agency  
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
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Introduction

Incorporating community-based water development into peace building

Transboundary water cooperation can correlate with regional stability and peace. Engaging cross border communities and utilizing their mutual dependence on shared water resources as a basis for cooperation can lead to common problem solving and peace building among those communities even in the midst of conflict.

In 2001, EcoPeace Middle East launched the “Good Water Neighbors” (GWN) program to raise awareness of the water problems shared by Palestinians, Jordanians, and Israelis. The GWN’s strategy of long-term deep work in the communities, sustaining a cross-border communication network, and insisting on addressing practical tangible issues and interests, rather than just peace or cooperation in general, has proven to bear fruits. The project has created real improvements in the water and environment sectors in many of the participating communities. Fifteen years ago, the project struggled to identify 11 communities who would agree to work together. After less than a decade, the project expanded to include 28 communities of which 14 communities share the Jordan River/Dead Sea Basin, and 14 communities share the Mountain and Coastal Aquifer and Coastal streams watersheds.

Under a new phase of the project, further expansions were implemented that address the larger region whereby 11 cross border watersheds were identified, divided into 6 Israeli – Palestinian shared watersheds, 2 Israeli – Jordanian shared watersheds and 3 Jordanian – Palestinian shared watersheds (see Table 1). These expanded efforts have been limited by financial constraints as the residents of these watersheds now constitute a large majority of the region’s population. Outreach to the larger population centers however are seen as an opportunity for generating more impactful peaceful cooperation for the mutual benefit of the region.

EcoPeace Middle East continues to work with municipal staff and residents in each GWN watershed to identify and address sources of pollution, advocate for increased water supply, and to find ways to answer the needs of our cross-border communities through projects that protect their shared environmental heritage. The GWN project’s constituency of community residents, including adult and youth activists, mayors, and municipal staff, exert enormous ‘bottom-up’ pressure on national decision makers in order to help generate the political will needed to advance solutions at the local, 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. EcoPeace’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 EcoPeace 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; EcoPeace 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 no less importantly, political sense.

The current water and sanitation crisis in Gaza and its regional implications is a wake-up call for the need for swift action. The dangers of the conviction that a simultaneous solution to all of the conflict’s core issues can and must be found in order to reach a final status peace agreement cannot be clearer. The implications of a Gaza health crisis will not be confined to the Gaza Strip but threaten regional stability and the “all or nothing” mindset has become a part of the problem.

A new 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 agreement on water will help build trust necessary to put the political process between Israel and Palestine 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. It also will facilitate expanded regional cooperation that includes Jordan and the solving of urgent issues faced in the Jordan Valley.

This is the fourth 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”. Through the Priority Initiatives methodology, EcoPeace was successful in helping leverage an estimated US$500 million of investments in GWN communities in Palestine, Jordan and Israel in the last decade alone.

**Advancing Priority Projects**

**Consultations**

EcoPeace 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, EcoPeace 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 taken place in all of the communities to highlight the need for solutions, and have included participation of media, decision makers, international donor institutions and active residents. EcoPeace’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 EcoPeace staff in several meetings, and many more advocacy meetings are planned for the coming two years. The Project Briefs are being publicly released at EcoPeace’s annual GWN conference, another important forum which brings together EcoPeace’s regional network of stakeholders with decision makers.
Advancing the Jordan Valley Master Plan (Jordan, Israel, Palestine)

Shared Waters/Geographic Description
The Jordan Valley forms part of the larger Jordan Rift Valley. The internationally recognized World Heritage values of the Jordan Valley are strongly related to its unique historic, religious, cultural, economic and environmental values, not least due to its typical rift valley topography. The area of the Jordan Valley between the Sea of Galilee in the north and the Dead Sea in the south is shared by Jordan, Israel and Palestine. The Lower part of the Jordan River (LJR), part of the Jordan River Basin, originates at the Sea of Galilee and meanders some 200 km down to the Dead Sea through the Jordan Valley.

Population
About 600,000 people live on both sides of the Lower part of the Jordan River, including about 58,000 Israelis (49,000 in Israel and 9,000 settlers in the West Bank), 65,000 Palestinians, 247,000 registered Jordanians and an estimated 250,000 foreign workers in Jordan originating mainly from Egypt, Iraq and recently from Syria.

Problem Statement
The environmental and ecological values of the basin have declined drastically during the last sixty years: its water has been diverted, its ecological systems degraded and its natural absorption capacities have been pushed to the limits. Large flows of untreated waste-water and saline water are discharged directly into the basin and substantial parts of the basin are inaccessible for the local inhabitants.

Historically the Lower part of the Jordan River received about 600 MCM / yr from Sea of Galilee in the north, mainly coming from the upper part of the Jordan River, and about 470 MCM / yr from the Yarmouk River in the north-east. With some addition inflow from the Zarqa River and nine other streams from the East Bank, the Lower part of the Jordan River had an outflow into the Dead Sea of about 1200 – 1300 MCM / year. Since the 1950’s the water from the river had been increasingly diverted by Israel, Syria and Jordan for domestic water supply and development of their agricultural sectors. Today the outflow into the Dead Sea is about 70 – 100 MCM per year or less.

Much due to competition over scarce water resources, conflict and unsustainable development practices the Jordan Valley is a poverty hotspot of the region. With lack of investments on the Jordanian side and Area C restrictions heavily limiting development on the Palestinian side, the valley suffers from pockets of 40% unemployment and 50% youth unemployment, increasingly highlighting both national and regional stability concerns.

Priority Initiative
Promote the signing of an MoU between the governments of Jordan, Israel and Palestine, to create a Trust Fund to advance an agreed set of projects that would exemplify the benefits of advancing a Regional Master Plan for the Valley.

Background Issues Related to the Priority
As part of EcoPeace Middle East’s efforts to advocate for the rehabilitation of the river and development of the surrounding valley, EcoPeace partnered with the Stockholm International Water Institute (SIWI) and Global Nature Fund (GNF) to devise a proposed Master Plan for Sustainable Development in the Jordan Valley. The Master Plan was released in June 2015 following 3 years of joint Israeli-Palestinian-Jordanian EU-funded research, led by the international Royal Haskoning DHV engineering consultancy firm. It comprises national plans for the Jordanian and Palestinian sides of the valley, incorporates a government-led Israeli Master Plan.
currently underway, that together create the first ever regional development plan for the valley. The Master Plan was developed around 7 strategic objectives: Pollution Control, Sustainable Water Management and River Rehabilitation, Sustainable Agriculture, Jordan River Basin Governance, Ecological Rehabilitation, Sustainable Tourism and Cultural Heritage Development, Urban and Infrastructure Development. These strategic objectives seek to promote peace, prosperity and security in the Jordan Valley and the adjacent regions.

**Objectives**
The signing of an MoU between the three governments, and the investment program to be launched as a result will help remove key sources of pollution, both sewage and solid waste, presently heavily contributing to the demise of the river. Investments in sanitation will directly contribute to improved public welfare at the community level, both removing sources of public health risk and enabling the reuse of treated wastewater for more sustainable agricultural production.

**Cross Border Impact**
With the implementation of the grand scenario and strategy described in the Regional Master Plan, by 2050 the Jordan Valley will be transformed into a healthy regional economy. The three populations will experience increased wealth, a clean and healthy environment and sufficient flows in the Jordan River to sustain healthy eco-systems. At the same time the river will act as a natural water conveyor and source for water supply in the Jordan Valley. Water will be equitably shared among the three riparian countries and the valley will be freely accessible for all nationalities within an appropriate security framework.

Biodiversity Restoration in the Northern Jordan Valley Bio-Region

Shared Waters/ Geographic Description
This priority project is between Jordan and Israel, in the northern area of the Jordan Valley in a unique bio-region. The bio-region is created by its proximity to the Sea of Galilee, higher precipitation rates than the rest of the valley, the several wadis and streams flowing into the Jordan River in close proximity to each other and the narrowness of the valley itself with mountains rising on either side. This area with the Ajlun – Gilead Mountains to the east and lower Galilee – Gilboa Mountains to the west is the narrowest part of the Jordan Valley. From the east side is the Yarmouk River, Wadi Arab and Wadi Ziglab streams all flowing into the Jordan River. From the north and west side is the outflow of the Jordan River itself from the Sea of Galilee, followed by the Yavne‘el, Yissakhar, Tavor and Harod Streams all joining the Jordan from the west.

Population
There are approximately 42,000 residents located on the Israeli side, Jordan Valley Regional Council, Beit Shean and Spring Valley Regional Council. The Jordanian communities of Muaz Bin Jabal Municipality and Tabket Fahel are home to approximately 70,000 people.

Problem Statement
In addition to the Jordan River being heavily demised due to fresh water diversion and pollution as described above, the other side tributaries have also been negatively impacted. The Yarmuk, Arab and Ziglab wadis have all been dammed from the east, with flows reduced from the west and the Harod stream, due to fish farm production, is contributing to large pollution flows into the Jordan River. Earlier research undertaken by EcoPeace has identified a loss of biodiversity around these streams of up to 50%.

Priority Initiative
Restore habitats, strengthen habitat connectivity through identifying ecological corridors and promote knowledge sharing between the local communities towards the restoration of the upper part of the Jordan River, with special focus on the upper stretch of the Jordan River and the Wadi Ziglab area.

Background Issues Related to the Priority
This priority builds on the recommendations of the Regional NGO Master Plan for Sustainable Development in the Jordan Valley 2015 which focuses on a number of interventions for the rehabilitation of the River Jordan. These include a specific intervention regarding ecological rehabilitation, and other interventions, such as pollution control, sustainable water management, river rehabilitation, and sustainable agriculture designed to have positive impacts on the restoration of biodiversity.

Efforts to create ecological core areas and biodiversity corridors in Israel and Jordan are already underway. In Jordan, the Sharhabil bin Hassneh EcoPark serves as a leading model for preserving ecologically important habitats in Jordan. Since 2004, the park has seen a return of over 350 species of flowers, 65 species of birds, and 5 species of reptiles to the area. Volunteers and community members planted thousands of trees on the area of 110 dunums, which has since been expanded to 2,000 dunums.
In Israel, along the Harod Stream, much investment in stream bank beautification and ecotourism has been invested by the Jordan River Drainage Authority. The Kinneret Drainage Authority has initiated restoring the natural character of some 11 kilometers of the stream in order to support the unique ecosystems in the area. The Kinneret Drainage Authority is overseeing the cleanup of the riverbed, as well as the biological treatment of the sludge, as a part of a 20 million NIS project.

The knowledge and experience gained from these cross border efforts in a manner that promotes exchange and cooperation can better restore habitat, create new core areas and expand those core restoration areas into larger ecological corridors.

Objectives
- Strengthen core areas for the restoration of biodiversity in the northern Jordan Valley area.
- Increase habitat connectivity and knowledge sharing between the communities in this bio-region.

Advancement
- Engage communities on both sides of the River in discussions about connecting and expanding core rehabilitation areas.
- Facilitate cross-border knowledge sharing between core area communities, researchers, academics, and activists.
- Rehabilitate core area habitats by promoting plant growth and promotion of local endemic species.
- Monitor and maintain core areas.
- Produce a larger plan to move forward with river restoration.
- Mobilize the current institutions to move forward with the restoration plan.

Project Characteristics
- Cross-border conferences between local government officials, academics, and researchers to exchange information and ideas about the rehabilitation efforts on both sides.
- Engage community and youth in activities that will encourage the decision makers to invest the necessary resources in the rehabilitation and the restoration projects.
- Implementation of rehabilitation programs on the ground in the Sharhabil bin Hassneh EcoPark and on the river banks on the Israeli side.
- Lobbying for funding through official declarations of cooperation on the subject matter.

Cross Border Impact
- Advancement of the rehabilitation activities in core areas on either side of the border will result in a stronger advancement for the rehabilitation of the river as a whole, which will serve the three countries.
- The rehabilitation and connectivity of core areas on either side of the border can serve as a model for ecological restoration for other communities and areas along the river.
- The rehabilitation and connectivity of core areas on both sides of the border can demonstrate social and economic benefits, such as tourism development, which would grow as a result of the rehabilitation of the river ecosystem.
- Success of the rehabilitation and connectivity of core areas on both sides of the border can boost political discussions and stability.

Biodiversiy in Northern Jordan Valley - swallowtail
3 Advancing the Green Economy in the Northern Jordan Valley Bio-Region

Shared Waters/ Geographic Description
The northern areas of the Jordan Valley are very rich with historical and natural sites and benefit from higher levels of rainfall than the rest of the valley. The beautiful Gilboa, Lower Galilee, Beit She’an, Tabket Fahel, Al-He- ma and Ajlun areas can be defined as a subset bio-re- gion. On the east side of the valley rise the Ajlun Moun- tains, a unique forested area in Jordan. On the west side rise the Gilboa and Lower Galilee Mountains also for- ested. The Jordan Valley in between these mountains has rich agricultural lands, dotted with ancient sites, where several streams flow down to the Jordan River from each side of the valley. EcoPeace’s Sharhabil Bin Hassneh (SHE) EcoPark is also located on the foothill of the Ajlun Mountains, on the Ziglab stream.

Population
Tabket Fahel is a medium-sized cluster of towns and is home to approximately 25,000 people, Al-Hema has over 21,000, while the Ajlun area has a population of around 80,000 residents. Beit She’an city is home to approximately 18,000 people with an additional 13,000 resi- dents in the surrounding Springs Valley Regional Council and 11,000 more in the Jordan Valley Regional Council. In the Gilboa Regional Council live 25,000 people.

Most of the populations here are scattered through small villages and towns, creating a mosaic of diverse development and beautiful nature.

Problem Statement
High unemployment due to lack of diversity of eco- nomic opportunities are prevalent throughout the val- ley. Ecotourism, as identified by the NGO Regional Mas- ter Plan, is an under developed sector in the valley that could greatly contribute to the economy of the region and help promote its sustainable development.

Priority Initiative
Further develop the Ajlun – Gilboa trail that would attract local and international tourists to experience a cross-cultural, authentic bio-regional experience.

Background Issues Relevant to Priority
This initiative builds on the EU supported Jordan Val- ley NGO Master Plan and the USAID supported Green Economy initiative project. It also seeks to strengthen a decade of investments by EcoPeace in the develop- ment of the SHE EcoPark. Specifically this initiative will build on the regional itineraries developed under the Green Economy initiative, where the relationships were developed with local businesses, tour guides and tour operators in order to promote ecotourism in this bio- region.

Objectives
Support local ecotourism and small entrepreneurs by further developing a cross border trail that goes through the areas of Gilboa, Lower Galilee, Beit She’an, Tabket Fahel, Hima and Ajlun.

Cross Border Impact
A cross Israel-Jordan trail will benefit both sides not only through an increase in tourism and extended stay throughout the area, which in turn will lead to a boost of revenues for local businesses but also will help ce- ment a shared identity amongst the residents that they live in and have responsibilities to carefully develop the unique bio-region that they enjoy.
Solid Waste Management in Deir Alla

Shared Waters/ Geographic Description
Deir Alla is situated on the east bank of the Jordan River. Jordan River waters flow passed Deir Alla, which is situated in the heart of the Jordan Valley and then make their way to Jericho and the Dead Sea.

Population
- Deir Alla: approximately 60,000 residents.
- Jericho: approximately 40,000 residents.
- Baptism Site with some 500,000 pilgrim visitors annually seeking to be baptised.

Problem Statement
Solid waste management in Deir Alla lacks the necessary sanitary infrastructure for collection and disposal of its solid waste. The Deir Alla landfill site is situated only one kilometre east of the Jordan River on an area of 364 dunums for the disposal of municipal solid waste. The landfill lacks electricity, water supply, service buildings, a site entrance, a control point, a service road, a perimeter fence, and specialized equipment. Waste is widely spread, not covered, and openly burned. There is no control of waste stability, layering or placement and with no lining leachate remains unmanaged and is released into the surrounding environment, seeping into groundwater and making its way into the Jordan River. Furthermore, municipal waste is collected from only four main streets in the city resulting in serious waste issues throughout the rest of the city and the surrounding areas. In the winter, periodic floodwaters carry unknown quantities of waste from the environment into the river.

Priority Initiative
To improve solid waste management practices in the Deir-Alla area, improve sanitation, and protect the environment.

Background Issues Related to the Priority
The mayor of Deir Alla is a vocal advocate for the rehabilitation of the Deir Alla landfill site, well aware of the health, environment and livelihood implications of the current situation. The mayor identified the NGO Master Planning process as the opportunity to try to attract national and international resources to help correct the situation. The mayor attracted some initial resources for more emergency measures.

Objectives
- Help lever age funding to build a modern sanitary landfill and improve services provided by the municipality.
- Seek business partners to invest in waste recycling in Deir Alla and encourage solid waste separation at source.
- Safer and more efficient methods of waste transportation.
- Promote community awareness and education on sustainable waste management.

Cross Border Impact
Living conditions for the nearest village to the Deir Alla landfill, Tall Al Mantah are the most unbearable but the impacts are region wide, including crossborder concerns of the spread of vector borne diseases. Jericho, the largest city on the west side and the Baptism Site that crosses both sides of the river are only 40 kilometres to the south.
New Water Network and Improved Sanitation for Madaba’s Refugee Camp, Zara Maain

Shared Waters/Geographic Description
Madaba, known as the 'City of Mosaics', is 30 km south west of Jordan’s capital Amman. It is bordering Balqa from the north, Amman from the east, Karak from the south, and the Dead Sea from the west. Deep gorge wadis connect the Madaba plains with the Zara Maain Springs and the Dead Sea basin.

Population
- Madaba - approximately 160,000 residents.
- The Refugee Camp - approximately 2,500 residents, established in 1957.

Problem Statement
The water network of Madaba refugee camp is completely dysfunctional due to the rusting of its steel piped network, resulting in a 60% water loss. Most residents of the camp are therefore not receiving water even on the one-day per week when the water is pumped by water authorities. Residents are relying on water tanks to meet their water needs causing a significant financial burden. In addition the camp has no sewage network, with sewage disposed through cesspits presenting another serious health hazard, and source of ground water, spring water contamination.

Priority Initiative
Attract funding to build a new water and wastewater network for Madaba Refugee Camp.

Background Issues Related to the Priority
The water authority and the water company Miyahuna are well aware of the urgent need to replace the old water network and the need for a new sewage collection network and are willing to cooperate as long as sufficient funds for the implementation of the project are secured.

Objectives
- Improving living conditions in the refugee camp in Madaba and addressing the concerns of its residents, who have long been neglected.
- Improve the overall management of water, both in supply and contamination.

Cross Border Impact
Minimum domestic water supply is a human right that should be of shared interests to all residents in the same basin. Prevention of contamination of ground water and springs that flow into shared water bodies is also of mutual concern.
Groundwater Protection in Salt

**Shared Waters/Geographic Description**
The city of Salt is located on a mountainous area overlooking the Jordan Valley from the eastern side. The area is very rich in nature, relatively high rainfall and beautiful wadis and springs, including Wadi Abu al Rada, Abu Diaeh, Zama, and Hadi making their way down to the Jordan River in the west. These wadis and spring water used to support ancient agriculture, enough to fully sustain local villages and small towns.

**Population**
- Greater Salt Municipality has approximately 100,000 residents.
- Al Magareeb Neighborhood west of the city has approximately 20,000 residents.

**Problem Statement**
Al Magareeb Neighborhood is surrounded by four wadis with high natural and potential tourist value; Wadi Abu al Rada, Wadi Abu Diaeh, Wadi Abu Zama, and Wadi Hadi. A septic tank for wastewater treatment was adequate in the beginning but today totally fails the area’s needs. Wastewater today flows in the main streets, is seeping into the ground water, and due to the high elevation and steep slopes -- towards the Jordan Valley, polluting the wadis and springs. The sanitation situation poses health hazards to residents and is a source of pollution in the wadis down to the Jordan Valley.

**Priority Initiative**
Support local municipality and water authority efforts to solve the sanitation issues of the Al Magareeb Neighborhood.

**Background Issues Related to the Priority**
A number of solutions were proposed, by the Water Authority, the municipality, and Al Balaka University with some interim measures implemented but insufficient funds raised.

**Objectives**
- Improve living conditions of residents, reduce disease concerns and promote area for nature tourism.
- Improve the overall management of water.

**Cross Border Impact**
Prevention of contamination of ground water and springs that flow into the Jordan Valley.
Protecting Ground Water in Auja

Shared Waters/Geographic Description
The town of Auja is located in the middle of the Jericho Governorate located 11 km north of Jericho City. Al `Auja is bordered by the Jordan River to the east, Fasayil village to the north, Kafr Malik and Deir Jarir village lands (in Ramallah Governorate) to the west, and An Nuwe‘ima town to the south. Al-Auja spring is one of the main springs in Palestine. The spring’s annual discharge reached around 14 million cubic meters (PWA, 2007). Auja residents have been denied access to the Jordan River and to the shores of the Dead Sea.

Population
According to the PCBS (2015) the population of Auja is 5,077 inhabitants.

Problem Statement
Auja lacks a sewerage network. Residents use cesspits for wastewater disposal which threatens public health and causes groundwater pollution.

Priority Initiative
Full scale demonstration of treated effluent reuse for agriculture through building a sewage collection system and WWTP for the town (if possible combined with the reuse of treated sewage from El Bira).

Background Issues Related to the Priority
Auja was in the recent past considered a rich agricultural area. Auja spring had a flow of 1,800 to 2,000 cubic meters per hour, which was the main source of water for irrigation. Now the flow is less than 5% of its historical flow, reducing cultivation to just 12% of agricultural land use. In addition to Auja regaining its fair share of water rights, surface, spring and groundwater, EcoPeace has prepared detailed design documents for the building of a sewerage network and a conceptual design for wastewater treatment and reuse in Auja village. The EU has supported a study to bring treated sewage from El Bira also to Auja for agricultural reuse. The Auja area has been identified by EcoPeace and others as a prime location to model the use of treated wastewater, in addition to freshwater, to boost Palestinian agricultural production.

Objectives
- Reduce groundwater contamination and protection of the Jordan River.
- Model reuse of treated effluent from proposed WWTP for agricultural reuse.
- Prevent wastewater flooding in streets and solve poor hygienic conditions.

Cross Border Impact
Prevention of contamination of ground water that contributes to contamination of the Jordan River.
Shared Waters/ Geographic Description
Jericho is located in the Jordan 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.

Population
Jericho has a population of approximately 40,000 residents.

Problem Statement
Winter rains can often lead to flooding of neighborhoods in Jericho. The Khedaiwi and Al-Qasab neighborhoods, in particular, are vulnerable to flooding because canals built in the past to protect the neighborhood have fallen into disrepair. Flood water levels often I meter high have led to damage to homes and evacuation of residents. Proper functioning of the canal system would bring the flood water to reservoirs for storage and later use for agriculture.

Priority Initiative
To rehabilitate the Al-Qasab canal in order to prevent flooding and to increase storage of flood waters.

Background Issues Related to the Priority
Jericho municipality included the need to repair the Al-Qasab canal as part of the Master plan for Jericho 2020 as prepared by a team of Italian experts.

Objectives
- Rehabilitate the old and damaged canal in order to protect life and property for residents in the Khedaiwi and Al-Qasab neighborhoods in Jericho.
- Increase ability to store flood water for agricultural use.

Cross Border Impact
- This project will lead to the better management of water resources in the Jordan Valley.
Advancing Sanitation Solutions in Wadi Nar/Kidron Valley

Shared Waters/ Geographic Description
Wadi Nar/Kidron Valley is a small, 24 km long (123 km²) arid basin featuring a seasonal steep altitude gradient of freshwater flows. It extends from west to east and north to south parts of Jerusalem, around the Old City of Jerusalem and flows to the east through the West Bank to the Dead Sea. The area boasts breathtaking natural beauty, includes significant archaeological discoveries, and is important to the three monotheistic religions in the basin. Rainfall ranges from 600 mm in the West to 50 mm at the Dead Sea in the East. The towns and villages within the basin are situated in its upper catchment, with the Mar Saba Monastery further east along the stream itself.

Population
Wadi Nar/Kidron Valley receives wastewater inputs from more than 300,000 people living in or at the peripheries of the catchment (around 100,000 Israelis and 200,000 Palestinians).

Problem Statement
Tragically, Wadi Nar/Kidron Valley serves as a sewage conduit for the south-eastern part of Jerusalem, as well as for the eastern part of Bethlehem and Beit Sahour. This includes the sewage that drains into the area by gravity, as well as some of the sewage that would naturally drain into the Og/Muqalek Basin located to the North East of Jerusalem which is transported to the basin via a collector. In addition, Ubeidiya, Abu Dis, Al Ezariya and some other small Palestinian communities also dump their sewage into the basin. The total discharge of untreated wastewater is estimated at about 15 MCM per year. In addition to the health, environmental and economic costs associated with the mismanagement of this basin, for many of the Palestinian towns and villages in the basin, cesspits are still in use, often leading to sewage in the streets, presenting an additional health hazard to local residents.

Priority Initiative
Advocate for a sustainable solution to the current situation in the valley that includes construction of a WWTP and needed sanitation networks in the Palestinian towns and villages in the basin and reuse the sewage of the basin.

Background Issues Related to the Priority
Political disputes relating to Jerusalem and settlements have prevented the advancement of sanitation solutions in Wadi Nar/Kidron Valley for over 20 years. The Israeli government, the Palestinian Authority and third party organizations have been active in proposing and developing plans that would solve this issue but all have had no progress to date, with residents, particularly Palestinians, left dealing with the consequences of this failure.

Objectives
- Support the construction of sanitation networks for all Palestinian residential areas in the basin.
- Support the building of a WWTP that would remove all sewage from the stream.
- Support programs for wastewater reuse for agriculture.

Cross Border Impact
Wadi Nar/Kidron Valley have the largest quantities of untreated sewage flowing in any one basin throughout the region. The sewage pollutes the Mountain Aquifer and the Dead Sea.
Shared Waters/Geographic Description:
The Dead Sea, also known as the Salt Sea, borders Jordan on the east side, with Palestine and Israel on the west side. In recent times, the Dead Sea has been divided into two basins: the North and the South. The southern basin is over-utilized by industrial activity, greatly contributing to the Sea’s rapid decline. There are many natural springs that feed into the southern Dead Sea areas of Ghour Hadeetha, Ghour Hazra, Ghour Safi, and Ghour Fifa on the Jordanian side. Because of the natural greenhouse effect and low ground ozone prevalent in the lowest place on earth, these areas typically have 10°C to 15°C higher temperature compared to above sea level areas. The existence of many springs and groundwater coupled with warm climatic conditions create perfect conditions for both seasonal and off-season production of crops.

Population
The Tamar Regional Council is one of the largest regional councils in Israel, but has the smallest population, around 1,400.

The South Ghour Municipality is located in the southern region of the Jordan Valley, south of the Dead Sea. It has a population of approximately 50,000 residents.

Problem Statement
To meet its economic needs, the area of South Ghour relies heavily on agriculture. The farmers mostly utilize manure from neighboring chicken and cow farms as fertilizer, which has proved to be problematic for the health of the local population. The use of unprocessed manure attracts house flies into the area that can carry diseases such as Typhoid and Child Diarrhea. According to the Health Department of South Ghour, each year, between the months of August and November alone, there are 250-300 reported cases of such diseases. Additionally, the decomposition of the manure often leads to infection of the plants through diseases, such as fungi. The house fly problem also negatively affects the Israeli side.

Priority Initiative
The Model Farm needs to reach out to a wider range of farmers and be scaled up to include a wider range...
of local issues. This would improve agriculture in South Ghour to a more productive level and decrease the use of hazardous methods of farming impacting negatively both Jordanian and Israeli communities.

**Background Issues Related to the Priority**

On January 20th, 2016, in the presence of Israeli Deputy Minister of Regional Cooperation MK Ayoub Kara, a Memorandum of Understanding was signed between the Tamar Regional Council and South Ghour Municipality. In partnership with South Ghour Municipality, Ministry of Agriculture, and Jordan Valley Authority, Jordan and in Israel, Tamar Regional Council, Arava R&D Center and the Israeli Ministry of Regional Cooperation, the Model Farm effort was launched.

The initiative aimed to create a Model farm to be developed as part of the Good Water Neighbors program. The project is being managed by a joint steering committee comprised of an equal number of representatives from the two sides, including EcoPeace Middle East staff from Israel and Jordan. Uniquely, funding is being contributed by the Tamar Regional Council and the Ministry of Regional Cooperation in Israel to create the Model Farm on the Jordanian side. A pond and a control room were built. In the first year (2016-2017) the Model Farm will focus on two types of semi-commercial crops, in order to try and identify the crop varieties that will best fit local conditions. The planted area will be increased in the second year.

**Challenges**

- The farm is in need of a local Jordanian agronomist(s), who would operate as a manager of the farm. At the moment it is a very rare practice in Jordan. The move towards advanced technologies requires the farmers to have a good understanding about the need for change and the use of new techniques and a trained agronomist on site would play a needed role to expand outreach to more farmers in the area.
- Post-harvesting facilities and improved marketing skills are needed in order to take the produce from the farm onto the display shelf. The current process is very primitive and needs assistance, because it makes an impact on the price and the total yield.

**Objectives**

- Achieve a first successful, semi-commercial crop year on the ground.
- Move to stage two of the Model Farm project, expanding outreach to the broader agricultural community in the area.
- Upscale the Model Farm by widening the scope of issues related to postharvest and marketing.

**Cross Border Impact**

The Model Farm benefits both sides by introducing more sustainable farming techniques that can be utilized by farmers in the South Ghour region. The project will increase the income of the society, enable improvement of better living conditions, and enhance the state of public health, including the issue of houseflies, on both sides of the border.
Advancing Sanitation Solutions along the Kishon-Muqataa Stream

Shared Waters/Geographic Description
The Palestinian and Israeli communities in this watershed are located on the Mountain Aquifer and share the Kishon/Naher Al Muqataa Stream. The Kishon-Muqataa stream is a seasonal stream and is characterized by floods during winter-time. It has two main tributaries: the first and main tributary flows to the north from the city of Jenin, passing eastward, under the Separation Barrier to the Israeli village of Ram-On. A second, more eastern tributary – Al Kaslan/Mukebileh Canal – carries domestic sewage and the agricultural runoffs of Jalameh and other nearby Palestinian villages 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 Regional Council (RC).

Population
On the Palestinian side, the Jenin Governorate is home to approximately 311,000 residents. The Jalameh village, which is the closest to the border, has some 2,500 residents, and is adjacent to the main crossing point to Israel, known as the “Jalameh Border Crossing”. Other communities in the area are the 11 villages of Marj Bin Amer. On the Israeli side, the watershed includes some 750,000 residents in 9 cities – one of them is Haifa, the third largest city in Israel; 7 regional councils; and 19 local councils. The municipality that is closest to the border is the Gilboa RC, which is made up of 31 communities comprising some 27,900 residents.

Problem Statement
The city of Jenin is located in the upper part of the stream and connected to a WWTP impaired by power shortages and in need of additional upgrades. The area of Marj bin Amer is not connected to any WWTP. As a result, poorly treated effluent, raw municipal sewage and agricultural runoff are polluting the stream and the underground water. On the Israeli side, near the Haifa Bay, the downstream area suffers from long lasting Israeli industrial pollution, and is currently being cleaned up and rehabilitated by the Israeli authorities at an estimated cost of 220 million NIS.

Priority Initiative
Advocate for further upgrade and proper operation of the Jenin WWTP. Advocate for a WWTP for the area of Marj bin Amer. Explore utilizing the new Ram-On WWTP in order to prevent the further downstream pollution of the Kishon-Muqataa Stream. Advocate for the use of all Mountain Aquifer, Coastal Aquifer And Coastal Stream Communities

Kishon rehabilitation work
Palestinian treated effluents to irrigate Palestinian agriculture, including the return of treated effluents from Ram-On.

**Background issues related to the Priority**
The Jenin WWTP underwent two phases of rehabilitation and expansion supported by the KfW between the years 2009-2015, at an estimated cost of 2.3 million euros. However, the plant still requires further rehabilitation and commitment to supply of electricity in order to produce higher quality effluent that can then be reused in Palestinian agriculture. The new Ram-On WWTP came as a substitute for the old and outdated Magen Shaul WWTP which used to serve the communities of Hevel Tan’anach but failed to meet the targeted quality. The new WWTP is expected to undertake tertiary treatment and start its operations in October 2016. It will serve a wider range of Israeli communities and is planning to treat to tertiary level, all effluents that cross the Green line.

**Objectives**
- Pollution prevention and control by eliminating the flow of raw or partially treated sewage from Jenin and the nearby Palestinian villages as well as the Israeli Hevel Ta’anach villages into the stream.
- Promoting and optimizing the needed capacity to run, operate, and maintain the reuse of treated effluent through capacity development programmes for institutions, farmers, and operators.
- Promoting sustainable agriculture by supplying Palestinian farmers with high-quality treated wastewater.

**Project Characteristics**
- Advocating for cooperation over sanitation solutions between Gilboa RC, the city of Jenin and the villages of Marj Ibn Amer.
- Lobbying for the signing of an MoU between the respective municipalities to transfer high quality treated effluent from the Ram-On WWTP to Palestinian farms. This will require the involvement of the IWA and the PWA (See Hadera-Baka Watershed PP).
- Identifying the upgrade needs of the Jenin WWTP through research and meetings with stakeholders and specialists.
- Advocating for raising the needed funds and permits for the upgrade and initiation of the works.
- Organizing cross-border meetings, workshops and creating initiatives to promote knowledge sharing between Israeli and Palestinian farmers in relation to the use of effluent irrigation as well as exploring new ways of cooperation (i.e. a model farm) and expand the application of sustainable agriculture in the watershed.

**Cross Border Impact**
The Kishon-Muqataa Stream is a transboundary water resource shared by Israeli and Palestinian communities. The pollution of this stream is contaminating the Mountain Aquifer, which is a main source of fresh water for both Israel and Palestine. In this highly productive agricultural area, treated wastewater needs to be valued as a resource and not allowed to pollute shared waters.
Pollution Prevention at the Wadi Abu Nar/Hadera Stream

Shared Waters / Geographic Description
The Hadera-Abu Nar stream travels westward from the Nablus Mountains to the Mediterranean Sea (a distance of approximately 50 km). On the way, the stream crosses the Green Line passed the communities of Baka Al Sharkiya and Nazlat on the Palestinian side, and Baka Al Gharbia on the Israeli side. The adjacent communities are situated above a particularly vulnerable area of the western basin of the Mountain Aquifer — a main freshwater resource for both Israelis and Palestinians.

Population
- Baka Al Gharbia on the Israeli side with a population of 28,000 residents.
- Baka Al Sharkiya, Barta’a, and Habla on the Palestinian Authority side with a combined population of 17,000 people. Nazlat has an additional 5,900 residents.

Problem Statement
The main sewage collection lines of the three villages of Baka Al Sharkiya, Barta’a, and Habla have been linked to the Israeli WWTP. This phase of the project was completed by UNDP, with the support of government of Japan (JICA) funds. The second phase of the project, which will connect the Nazlat community to the network, will also be carried out by UNDP, using Dutch Government funding. However, the households on the Palestinian side have yet to be linked to the main line and raw sewage continues to flow in the stream. This is due to a disagreement regarding the price to be paid for treating transboundary effluents. A Memorandum of Understanding (MoU) as to the price to be paid for treating transboundary effluents between the Palestinian and Israeli water authorities has been under negotiations for close to two years. Without an agreement, the sewage will continue to flow in the Hadera-Abu Nar stream, causing widespread health nuisances and pollution, affecting the local population and contaminating the groundwater of the Mountain Aquifer.

Priority Initiative
Advocating the signing of an MoU between the Palestinian and Israeli water authorities as to the price to be paid for treating transboundary effluents.
Background Issues Related to the Priority
In July 2007, as part of the GWN Project, the mayors of Baka Al Gharbia and Baka Al Sharkiya signed an MoU agreeing to cooperate on cross-border water issues, aiming to advance shared sewage solutions and the rehabilitation of the Hadera-Abu Nar stream. Following the signing of the MoU, substantial investments were made in order to realize the 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. The Joint Israeli-Palestinian Water Committee (JWC) approved the EcoPeace-initiated idea to treat Baka Al Sharkiya’s sewage in the WWTP that was completed in Baka Al Gharbia. Under the implementation of the PWA and with the financial support of UNDP and JICA, a sewage collection system was built for Baka Al Sharkiya and the neighboring communities. The actual household connection of the network is currently on hold due to the failure to sign an MoU regarding the price of treating cross-border sewage.

Objectives
- Facilitate the completion of the first phase of the sewage connection project by advancing the signing of the MoU between the Palestinian and Israeli water authorities.
- Support the establishment of a sewage network for the Nazlat villages and connect it with the Baka Al Sharkiya network.
- Support a fair tariff system in which sustainability and cost recovery can also be ensured.

Cross Border Impact
Past success in linking the two sewage networks is now dependant on the signing of an MoU that would result in removal of pollution from shared ground and surface water resources and alleviation of public health concerns. This would also ensure the ecological rehabilitation of the stream and its environment.
Treatment of Olive Mill Waste in the Zomer-Alexander Stream

Shared Waters/ Geographic Description
The Alexander stream and its tributaries, the Zomer (Nablus) 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. These streams flow over both the Mountain and Coastal Aquifers. In Emek Hefer, all the tributaries meet and flow westward to the Mediterranean Sea.

Population
The main municipality on the Israeli side is the Emek Hefer Regional Council, comprising some 41,000 residents in 44 communities. The main municipalities on the Palestinian side are Nablus and Tulkarem. The Northern West Bank cities of Tulkarem and Nablus are home to 182,053 and 380,961 residents respectively, living in both governorates.

Problem Statement
Wadi Zomer has many pollutants originating from different industries – stone cutting, sesame and olive mill. A major pollutant of the wadi is the olive mill waste, called “akar” or “ziber”. The area between Nablus and Tulkarem is characterized by an intensive industry of olive oil mills that unfortunately dispose their waste directly into the wadi. There are more than 40 olive mills located within the watershed, all of which dump untreated “akar / ziber” into nearby streams between October and December each year. The polyphenol compounds reduce the dissolved oxygen level in the water, thus damaging the ecosystem and enhancing anaerobic activity, which leads to the reduction of dissolved oxygen in the water and the destruction of aquatic life in the stream.

Priority Initiative
To reduce the quantity of olive oil waste being dumped or otherwise reaching the wadi by implementing olive oil waste treatment and advance operating technologies in the local mills or in the wastewater treatment plants.

Background Issues Related to the Priority
The construction and successful operation of West Nablus WWTP by the city of Nablus with support from the KFW is a major achievement. The plant treats 10,000 m3/day of domestic sewage originating from Nablus and nearby villages. The secondary level treated wastewater however is not utilized for agricultural reuse and unfortunately is returned to the wadi where it mixes with raw sewage from downstream villages west of the Nablus WWTP and other pollutants reaching the Yad Hana WWTP in Israel. Yad Hana does not have the capacity to treat different types of effluents and hence the wastewater originating from the West Bank flows directly to the Alexander River. During the olive oil season, the “akar / ziber” wastewater is diverted to a reservoir in Israel and then directly dumped into the river during winter flood flows which is not a sustainable solution. There is an urgent need to deal with the problem “at source”, namely, the olive mills located in the West Bank.

During the season of olive harvest, more than 200,000 cubic meters of olive mill waste are generated in the Palestinian Territories, thousands of which flow into

Zomer Alexander Watershed
Source: International Journal of River Basin Management - Volume 8, 2010 - Issue 2
the Zomer-Alexander wadi in different locations along the stream. Combined with other pollutants from the different industries, this dense wastewater cannot be treated even in an intensive wastewater treatment plant (WWTP). In order to protect the stream and groundwater, an “at source” approach should be implemented. However, there are currently no available feasible technological solutions to this problem. Research and cooperation is underway between different specialists from the government, academia and civil society to find a solution. EcoPeace is currently liaising with researchers from the Ben Gurion University, Migal – Galilee Research Institute and other researchers from the European Union. Some of the solutions that are being examined are spreading olive mill waste in olive fields, separating the polyphenols compounds for the cosmetic industry and pilot facilities in wastewater treatment plants.

**Advancement**

This project will focus on two main tracks:

1. Research – EcoPeace will advocate for more research in this field, and will continue to contact stakeholders and relevant researchers in the region and abroad, in order to explore the most feasible solution for this watershed and promote its implementation.

2. Promoting potentially successful alternatives for olive oil waste disposal: the West Nablus WWTP is planning to initiate a pilot to collect olive oil waste from 8 mills in the area, insert it into the plant’s digester for biogas production and then dispose of the final sludge at a dumping site. If this pilot succeeds, it could be expanded to treat and dispose all of the olive oil waste, both in Palestine and Israel.

**Objectives**

- Reducing the amount of olive oil waste flowing to the wadi during harvest season.
- Alleviating the burden of industrial waste flowing to the wadi which is affecting the functionality of the Israeli wastewater treatment plants which will contribute to the rehabilitation of the stream.
- Enhancing cooperation between Emek Hefer Regional Council, the Nablus Municipality and the West Nablus WWTP.

**Project Characteristics**

- Working with researchers in the region and around the world in order to investigate the most suitable and feasible technology to treat the olive mill waste in this watershed.
- Promoting and helping to organize cross border meetings between West Nablus WWTP staff, Palestinian municipalities in the area and the Emek Hefer Regional Council stakeholders.
- Studying the feasibility of olive oil waste disposal in Israeli WWTP’s digesters.

**Cross Border Impact**

Mitigation of cross border pollution stemming from the olive oil industry will lead to improved water quality of the Zomer-Alexander stream as well as the Mountain Aquifer water resources which are shared by both Palestinians and Israelis. Decreasing the pollution going into the Zomer-Alexander stream will benefit both sides of the border in terms of a cleaner environment, removal of health hazards and increased opportunities for transboundary ecotourism between Palestinians and Israelis.

*Nadav Tal led the writing of this project brief*
Supporting the Construction of the WWTP in Salfit

Shared Waters/Geographic Description
The Yarkon/Qana basin covers an area of about 1,800 km², most of which lie on the Palestinian side. 5 major Palestinian springs located in the Salfit Governorate (PWA, 2012) are in this basin. Four springs are utilized for domestic purposes, whilst the other is utilized for both domestic and agriculture purposes.

Population
The Salfit governorate population is 70,707 residents (PCBS 2015) living in Salfit city and surrounding communities. There are 3.7 million people on the Israeli side of Green Line living in the Gush Dan area.

Problem Statement
Salfit city has been connected to a public sewerage network since the year 2000 but this network captures just 10% of the total population of the Salfit governorate. The rest of the housing units use unhygienic and environmentally unsound cesspits (PWA, 2014) that pollute shared surface and ground waters including those used by residents themselves for both domestic and agricultural purposes. Water scarcity in the governorate of Salfit have been particularly severe in the last two summers due to political and technical reasons where the PWA report in 2012 showed a deficit of 1 MCM of water.

Priority Initiative
To support the recent KfW decision to build a WWTP for Salfit and encourage an agricultural reuse plan.

Background Issues Related to the Priority
Earlier PWA and KfW advances that were made to build a WWTP for Salfit were stopped by the Government of Israel, despite earlier IWA approval, due to its proximity to the settlement of Ariel. Salfit and EcoPeace successfully led advocacy efforts to encourage KfW to return to this WWTP investment in a new location. Based on the PWA’s national strategy report (2014) the total amount of wastewater discharged from the Salfit governorate is 1.75 MCM/year. On the other hand, the agricultural sector in Salfit consumes only 0.7 MCM annually for 5,000 dunums of irrigated fields for both fruit and vegetables, leaving more than 80,000 dunums dependent on rainfall. Hence, treated effluent can be reused as an important source for irrigation for fruit and vegetables in support of the local economy.

Objectives
- Reduce groundwater contamination and preserve the water spring into the wadi
- Reuse of treated effluent from the planned treatment plant for agriculture.

Cross Border Impact
Reduce crossborder pollution and provide an additional water source to promote the Palestinian economy.
Shared Waters/Geographic Description
The Soreq-Sarar watershed is 722 km², and the main stream that flows through it is 65 km long. Soreq is the largest major valley draining West Jerusalem towards the Mediterranean Sea. Its main tributary is the Refaim/Wadi Ahmad stream, and other tributaries include streams beginning at the outskirts of Ramallah, Mevaseret, Abugosh, most of Mateh Yehuda, Beit Jallah and West Bethlehem villages and Beit Shemesh. Therefore, the shared watershed runs along and across the Green Line in numerous locations, and includes Israeli and Palestinian cities, towns and villages on the shared Mountain Aquifer. The stream continues further westwards adjacent to the Israeli cities of Rehovot, Yavne and Nes Ziona and the adjoining rural communities.

Population
The direct Israeli beneficiary of this project is the Mateh Yehuda Regional Council (RC) that is located in the Judean/Jerusalem Hills, and is home to over 51,000 residents living in 56 communities. On the Palestinian side, the beneficiary communities are the West Bethlehem villages of Battir, Husan, Nahalin, Wadi Fuqin and Al Walajeh with a population of approximately 29,500 residents.

Problem Statement
Though 95% of the area is open spaces including forests, groves, orchards, etc., the landscape in this watershed and its survival are threatened by urban and infrastructure development, intensive agriculture and the pressure of growing tourism. Unplanned accessibility and sporadic unprofessional restorations add to the damage. The central area threatened is from Ein Karrem to Wadi Fuqin, and Refaim / Wadi el Ward from Ein Hania to Ein Kobi.

Priority Initiative
Advance cross border ecotourism and cross border conservation of the cultural landscape, based on developing shared policies, management and accessibility for Israeli and Palestinian residents and visitors.

Background Issues Related to the priority
EcoPeace’s previous Priority Projects successfully halted any advance in building the separation barrier through both Wadi Fuqin and Battir lands. EcoPeace played the lead role including in helping Battir’s listing as a World Heritage site. On the Israel side, EcoPeace focused on preparation and implementation of a master plan for mountain springs in Mateh Yehuda - Beit Shemesh region (2014), and cross border ecotourism (2015). This led to the integration of the master plan into the Mateh Yehuda RC’s sustainability master plan (yet to be approved). Moreover, there are several development programs in some communities (such as Mevo Beitar-
Tzur Hadassa and Ein Rafa) that will incorporate the master plan. In a latter project, the model of ecotourism in Mateh Yehuda and West Bethlehem area was the basis for advancing cross border cooperation between tour operators in the area, within the framework of EcoPeace’s USAID supported GEI project (Green Economy Initiative).

**Advancement**
- Mapping and surveying of springs and terraces identified and prioritized in target locations.
- Marking of trails and construction of signs in target locations.
- Cultivation of agricultural plots in conserved landscapes.
- Engaging the communities via cross-border meetings of stakeholders and specialists, workshops, etc.

**Objectives**
- Accessibility and benefit for local residents on both sides to a conserved area.
- Support sustainable tourism and agriculture.
- Advance cross-border ecotourism, awareness, research and preservation of landscape heritage.
- Fostering economic stability, capacity building and empowerment of men and women from the local communities on both sides.
- Include environmental heritage sites in a network and organized tourism in the region.

**Cross Border Impact**
The project will advance cross-border business relations through ecotourism and support solidarity and regional identity of local rural communities through mutual conservation of cultural landscape resources.

Gilat Bartana led the writing of this project brief
Advancing Water and Sanitation Hygiene (WASH) Solutions for 5 West Bethlehem Villages

Shared Waters/Geographic Description
Five villages in Western Bethlehem and the Mateh Yehuda Regional Council (RC) share a portion of the Mountain Aquifer, which is a main source of water supply for both Palestinians and Israelis. The Palestinian villages lie on a recharge area of the aquifer, and they rely on natural springs as their source of water, especially for irrigating their agricultural land. However, many springs are now dried up or polluted by runoff from agriculture, sewage, gasoline stations and other infrastructure.

Population
Situated west of Bethlehem, the five villages of Battir, Husan, Nahalin, Wadi Fuqin and Al Walajeh have a population of approximately 29,500 residents. The neighboring Israeli community of Mateh Yehuda Regional Council is located in the Judean/Jerusalem hills, and is home to over 51,000 residents living in 56 communities (not all are included in the watershed). Many residents of the area, on both sides of the border, depend on agriculture and tourism for a portion of their incomes.

Problem Statement
Two of the Palestinian villages suffer from a degraded water supply network and all five villages are currently suffering from a lack of sanitation services including wastewater network, collection, and treatment. The use of cesspits has caused pollution of water springs in the villages. According to the results of biological test analysis, carried out on a regular basis by the Palestinian Ministry of Health, the water of these springs is contaminated with fecal coliform bacteria as a result of water mixing with sewage leaking from cesspits into the groundwater basin, making it unfit for domestic use.

Priority Initiative
Improve water supply for Battir and Al Walajeh and construct a sanitation network for the villages of Battir, Nahalin, Husan, Wadi Fuqin and Al Walajeh, thus protecting water resources from pollution and reducing conflicts over basic access to water supplies.

Background Issues Related to the Priority
Based on EcoPeace advocacy, the World Bank has successfully replaced the piped water supply networks in three villages: Nahalin, Husan, and Wadi Fuqin. The water supply network has not been replaced in Battir due to funding shortfalls. The project proposal did not include the West Bethlehem village of Al-Walajeh. Also based on EcoPeace advocacy, in 2015, the World Bank, in conjunction with the PWA are conducting a feasibility study on connecting the five West Bethlehem villages to sanitation networks and treatment. This study will be finished by the end of 2016. The implementation of these studies requires additional funds.

Objectives
- Attract funds for replacement of water supply network in Battir and Al Walajeh.
- Attract funds for the construction of a sanitation network for the West Bethlehem villages.

Cross Border Impact
These projects will benefit all inhabitants of the watershed by protecting shared water resources from pollution. It will also reduce conflicts over basic access to water supplies by ensuring adequate water access for the Palestinian villages.
Shared Waters/ Geographic Description
The Hebron stream has many names: Wadi Al-Khalil, Wadi Al-Samen and Nahal Hevron. The stream originates in the Hebron Hills in the West Bank running southwest along 45 km crossing Be’er Sheva in Israel, and ending in Wadi Gaza and the Mediterranean Sea. It flows over an area of both the Mountain and Coastal Aquifers.

Population
On the West Bank side there are 706,000 Palestinian residents (PCBS, 2016) in the watershed. Across the Green Line the stream passes Israeli Jewish and Bedouin communities comprising almost 49,000 residents. The stream then continues to Be’er Sheva, with a population of more than 203,000 residents and further downstream to the area of Eshkol Regional Council with a population of 13,000 residents. The stream ends in the Gaza Strip on the Mediterranean coast with 1.8 million residents.

Problem Statement
The Hebron stream was originally a flood stream. Since the 1990s, the Hebron stream started receiving untreated wastewater from the city of Hebron, the Jewish settlement of Qiryat Arba, and the surrounding Palestinian villages. Wastewater currently flowing through the Hebron Stream is a mix of domestic (94%) and industrial (6%) sewage containing a high level of solid waste and hazardous materials originating from the stone cutting, metal, olive oil, tannery and other industries. Almost 200 industrial facilities discharge their wastewater into...
the Hebron stream. Wastewater discharges into the Hebron stream were estimated to be 8,000 – 11,000 m$^3$/d by Tal et al. The pollution severely impacts the shared ground and surface water resources, the environment, and the health of both Palestinian and Israeli communities dwelling along the stream.

**Priority Initiative**

Support efforts of the World Bank in advancing the building of a domestic WWTP for Hebron; the French Development Agency in pre-treatment of industrial waste needs; and finding donor support for the reuse of all treated wastewater and removal from the stream.

**Background Issues Related to the Priority**

Since the mid 1990’s, the Hebron Stream has been the focus of concerted environmental attention. Following USAID’s withdrawal of funds to build a WWTP for the city in 2006, EcoPeace and local municipalities advocated for other donors to take on the investment. Citizens in Israel even took the Government of Israel to the High Court that led to the Israeli side building a treatment facility just over the Green line. In these last years the World Bank together with the EU and AfD have committed the necessary funds to build a WWTP for Hebron. Though behind schedule, tender documents are supposed to be soon released for the construction of the WWTP for domestic sewage treatment, and USAID has completed the building of the access road to the site. Most recently, AfD has in principle committed an additional 15 million euro for the pre-treatment needs of the industrial sewage. The AfD effort compliments earlier investments of the EU and USAID, particularly as regards the stone cutting industry, and EcoPeace and USAID efforts as regards the tannery industry.

**Objectives**

- Support World Bank, PWA and Hebron Municipality efforts to advance in a timely fashion the building of the domestic level WWTP for Hebron and its later expansion to include Yatta.
- Attract funding for the development of a reuse strategy and advocate for its advance in parallel to the WWTP being built.
- Support AfD and PWA efforts to survey and later implement investments in the industrial pre-treatment solutions needed.

**Cross Border Impact**

The combination of the industrial content combined with the sewage mix makes advancing this project critical to avoid further degradation of the environment and public health concerns for both Palestinians and Israelis. Toxic substances including carcinogenic wastes are known to be released here to the environment. Advancing reuse for agriculture is also critical so that treated sewage is then not mixed again with untreated sewage downstream for any new WWTP, as presently experienced in the west Nablus Zomer/Alexander Stream.
Advancing Sanitation Solutions in the Gaza Strip

Shared Waters/Geographic Description
The Gaza Strip and the surrounding Israeli municipalities are located on the Coastal Aquifer, a major water resource for both sides. Recharge of the aquifer takes place from direct rainfall, surface water streams and flood events. Gaza acquires 95% of its water from the aquifer, and this has led to a state of extreme overuse with water extraction rates three times that of the renewable supply. Currently, 95% of wells in the Gaza Strip are more saline than health standards permit for drinking water. The natural marine circulation in this part of the sea is north-easterly, which means that untreated wastewater from Gaza travels along the Gaza coast and towards Israeli beaches.

Problem Statement
The Gaza Strip currently lacks suitable sanitation solutions, since the existing wastewater treatment plants in the area cover only a quarter of the wastewater being generated in Gaza annually. In addition, the existing plants suffer severe electricity shortages, which prevent them from treating the delivered wastewater. This results in the discharge of approximately 90,000 CM per day of raw or partially treated sewage, into the Mediterranean Sea and the Coastal Aquifer - the main source for drinking water in Gaza. Moreover, the wastewater flows up the coast polluting Israeli beaches, and potentially causing hazards for the desalination plant near the city of Ashkelon which supplies 20% of Israel's drinking water.

Population
On the Palestinian side, this project focuses on the Gaza Strip, inhabited by 1.8 million residents, which rely heavily on the Coastal Aquifer as a source for drinking water. On the Israeli side, the project focuses on the municipalities around the Gaza Strip approximately 77,000 residents, and along the Israeli coastline, including the city of Ashkelon, with approximately 127,000 residents - a total of over 200,000 people.

Priority Initiative
Advance proper sanitation solutions, including energy supply, to treat the sewage of the 1.8 million people living in the Gaza Strip to help avoid a further humanitarian crisis in Gaza and the region.

Background Issues Related to the Priority
An estimated 53 MCM of wastewater is generated annually in the Gaza Strip and this figure is expected to

Gaza sewage (photo credit to Ahmed Dallou)
rise to 57 MCM by 2020. The combined capacity of the four WWTPs in the strip can only treat a quarter of that amount (11 MCM per year) and only if they had sufficient electricity to operate. The largest sewage project currently implemented by the World Bank in Gaza is the Northern Gaza Emergency Sewage Treatment (NGEST) project. It includes the construction of a wastewater treatment plant with a capacity of 35,000 CM per day. Until recently the source of electricity needed to power the new WWTP being built was an unknown. Much due to EcoPeace led advocacy, the PWA, World Bank and even members of the US Congress were able to obtain a commitment from the government of Israel to supply additional electricity needed. Israeli Prime Minister Netanyahu intervened and responded to the closure of the Ashkelon desalination plant due to pollution. Additional sanitation projects are currently at different stages of progress such as the Gaza Middle Area Plant, initiated by the KFW, and the Khan Younis Plant, funded primarily by the Government of Japan and implemented by UNDP-PAPP. Both plants have experienced extensive delays, and are not expected to be operative before 2017-2018. In addition, the Gaza Coastal Management Water Utility, supported by the Red Cross, initiated 3 emergency projects, in Khan Younis, Rafah, and Wadi Gaza, mainly refurbishing existing treatment facilities with the aim to keep these facilities functional until the major wastewater treatment plants in the Middle Area and Khan Younis reach full capacity.

Objectives
- Support all of the international efforts to build the new WWTP needed in Gaza.
- Monitor and continue advocacy for the needed electricity to run all WWTP.
- Help reverse the deterioration in water quality of the Coastal Aquifer.
- Help prevent pollution of the Mediterranean coastline.
- Protect public health on both sides from sewage pollution and low-quality drinking water.

Cross Border Impact
This project aims to alleviate the humanitarian water and sanitation crisis facing the Palestinian population of the Gaza Strip with real regional ramifications for both Israelis and Egyptians should pandemic disease break out. Project advance would reduce pollution of the Coastal Aquifer and the Mediterranean coastline and marine life, both important natural resources to Palestinians and Israelis alike.
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