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A Note of Gratitude

This pre-feasibility study was carried out by EcoTech Jordan, an environmental and management services consulting firm based in Amman. EcoTech experts involved in the study include: Project Manager Tanya Gorskay, Nazih Bandak, Jumana Salem, Lara Zureikat, Amer Jabarin and Amjad al Nsour.

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Further thanks are due to the architecture teams from Yale University, USA, Bezalel Academy of Arts and Design, Jerusalem and the participating Palestinian and Jordanian architects who joined together in an intensive charrette at the Jordan River Peace Park site in May 2008. The pre-feasibility report served as an important resource for the teams. Likewise, many of the maps created during the course of the intensive design workshop have been utilized here. For more information on the charrette please visit the Jordan River Peace Park project page at www.foeme.org.
Executive Summary

The proposed project, initiated by the municipalities of Muaz Bin Jabal (Jordan), the Jordan Valley Regional Council (Israel) and Beit Shean Regional Council (Valley of Springs Regional Council) (Israel) in cooperation with EcoPeace/Friends of the Earth Middle East, aims at establishing the Jordan River Peace Park, a joint eco-tourism and cultural heritage project encompassing the natural and cultural landscapes of Bakoura, Naharyim as well as the historical crossing point over the Jordan River at 'Jisr al-Majami'/Gesher.

Located in the Jordan River Valley at the heart of the Great Rift Valley, the area of the proposed Jordan River Peace Park is situated at the confluence of the Yarmouk and Jordan Rivers. The unique natural landscape formed at the junction of these two rivers includes both arid and wetland environments. Furthermore, the area is situated at the center of one of the most important migratory flyways on the globe, with an estimated 500 million birds migrating through twice annually. Due to the area's limited access it is one of the most pristine habitats in all of the Jordan River Valley.

In addition to the important natural heritage of the area, the Jordan River Peace Park encompasses numerous sites of cultural heritage of local, regional and world value. Many of the area's sites reflect its geographical and historical function as a crossing point over the Jordan River and as such a site of interaction and cooperation between the neighboring communities. This theme is seen most prominently at the Roman-Mamluk, Ottoman and British bridges and the Mamluk Khan at 'Jisr al-Majami'/Gesher as well as the hydroelectric power plant established with the support of King Abdullah I to supply electricity to both Palestine and Jordan.

The proposed Jordan River Peace Park has the potential to yield significant revenues for local and national beneficiaries. The site is rich in opportunities to establish walking, hiking, and biking trails, as well as scenic outlooks and migratory bird observation stations. The site's access to the Jordan River makes it one of the only locations in the region where visitors can view the historic River; a site significant to more than half the world's population.

The Peace Treaty enacted between the State of Israel and the Hashemite Kingdom of Jordan in 1994 created a special regime status in the area of Naharyim/Bakoura. This status upholds Jordanian sovereignty in the area while also recognizing Israeli private land ownership and property rights. This unique legal status provides an important precedent and opportunity for cooperation in the proposed area of the Jordan River Peace Park.

This pre-feasibility study provides an analysis of the current environmental, socio-economic, and water resources in the area. A conceptual design was prepared for the rehabilitation and proposed use of the structures in the area. The study also addresses the management and security issues for the operation of the proposed Peace Park. The financial analysis undertaken here shows the project to be financially and economically feasible.
TABLE OF CONTENTS

1 INTRODUCTION ......................................................................................................................8
  1.1 OBJECTIVES OF THE STUDY .........................................................................................8
  1.2 SCOPE OF THE STUDY ...................................................................................................8

2 PROJECT CONCEPT ..............................................................................................................9
  2.1 PROJECT STAGES ..........................................................................................................9

3 ANALYSIS OF THE CURRENT SITUATION .......................................................................13
  3.1 STUDY APPROACH ........................................................................................................13
  3.2 NATURAL RESOURCES AND ENVIRONMENTAL OVERVIEW ........................................13
    3.2.1 Physical Features ......................................................................................................13
    3.2.2 Environmental Features ..........................................................................................14
    3.2.3 Biological Resources ..............................................................................................18
      3.2.3.1 Flora ..................................................................................................................18
      3.2.3.2 Fauna ...............................................................................................................21
    3.2.4 Avifauna ..................................................................................................................23
      3.2.4.1 Agriculture ........................................................................................................23
  3.3 SOCIO-ECONOMIC, HISTORICAL AND CULTURAL RESOURCES .......................................24
    3.3.1 Israeli Adjacent Areas ..............................................................................................24
      3.3.1.1 Old Gesher Site .................................................................................................25
      3.3.1.2 Naharayim Site .................................................................................................29
    3.3.2 Adjacent Jordanian Areas .........................................................................................31
    3.3.3 Rotenberg Hydroelectric Power Plant ....................................................................32
    3.3.4 Train Station ............................................................................................................35
    3.3.5 Commemoration of Hattin Battle ............................................................................35
  3.4 WATER RESOURCES .......................................................................................................36
    3.4.1 Yarmouk River .........................................................................................................36
    3.4.2 Lower Jordan River ..................................................................................................37
    3.4.3 Groundwater Resources ..........................................................................................38
    3.4.4 Water Quality ..........................................................................................................40
  3.5 PROVISIONS IN THE PEACE TREATY ON WATER ALLOCATION .......................................40
    3.5.1 Special Provisions in the Peace Treaty on Bakoura Area ........................................41
    3.5.2 Water Supply and Water Quality Issues ..................................................................41
      3.5.2.1 Water Supply Options ......................................................................................41
  3.6 LEGISLATIVE FRAMEWORK ..........................................................................................43
    3.6.1 Jordanian Legislation ..............................................................................................43
    3.6.2 Israeli Legislation .....................................................................................................45
  3.7 TECHNICAL FEASIBILITY AND CONCEPTUAL DESIGN ....................................................46
    3.7.1 Flood Occurrence ....................................................................................................49
    3.7.2 Water Quality Considerations ................................................................................49
    3.7.3 Conclusions and Recommendations ......................................................................51
  3.8 ENVIRONMENTAL ZONING ............................................................................................52
  3.9 ARCHITECTURAL CONCEPTUAL DESIGN .....................................................................53
    3.9.1 Focus of Study .........................................................................................................53
    3.9.2 Methodology ..........................................................................................................57
    3.9.3 Proposed Design and Intervention Strategy ............................................................57
    3.9.4 Site Constraints (Challenges) ..................................................................................58
      3.9.4.1 Conflict of Interpretation ..................................................................................58
      3.9.4.2 Challenging and Costly Renovation Work (Power Station Complex) ..................59
      3.9.4.3 Landscape Rehabilitation ..................................................................................59
  3.10 PROPOSED SITE FACILITIES (NEW AND ADAPTED BUILDINGS) ....................................59
  3.11 PHASE I PROPOSAL .........................................................................................................61
    3.11.1 Gateway/Visitor Orientation Point ...........................................................................61
    3.11.2 Workers’ Housing: Eco-Lodging Facilities ............................................................61
3.12  RAILWAY STATION: BICYCLE SHOP ................................................................. 63
3.12.1 Armed Forces’ Offices: Panoramic Lookout .................................................. 64
3.12.2 Yarmouk Lake and Bird Watching Amenities ................................................. 64
3.12.3 Tracks, Trails, and Signage .............................................................................. 64
3.12.4 Landscape Rehabilitation ............................................................................. 64
3.12.5 Fencing ........................................................................................................... 65
3.13  PHASE II PROPOSAL ....................................................................................... 65
3.14  PRESSURE TANK: PANORAMIC TERRACE..................................................... 66
3.14.1 Power Station: Visitor Center ......................................................................... 66
3.14.2 Transformer Station: Art Workshop ................................................................ 67
3.15  PHASE III PROPOSAL ..................................................................................... 68
3.15.1 Visitors’ Circulation in the Park ..................................................................... 68

4  MARKET ANALYSIS ............................................................................................. 69
4.1  TOURISTS VISITS, HOTEL DISTRIBUTION ....................................................... 75
4.1.1 General ............................................................................................................. 75
4.1.1.1 Tiberias ....................................................................................................... 76
4.1.1.2 The Jordan Valley Regional Council ............................................................ 77
4.1.1.3 Beit Shean Regional Council (Valley of Springs Regional Council) .......... 77
4.1.2 Tourism Revenues ......................................................................................... 78
4.1.2.1 Tiberias ....................................................................................................... 80
4.1.2.2 The Jordan Valley ...................................................................................... 81
4.1.2.3 Beit Shean Valley ...................................................................................... 81
4.1.3 Ecological tourism .......................................................................................... 81
4.1.4 Demand for Ecological Tourism in the World ............................................... 81
4.1.4.1 Ecological tourism in Israel .................................................................... 82
4.2  TARGET GROUPS ............................................................................................... 82
4.2.1 Target market .................................................................................................. 82
4.2.2 Potential Competition .................................................................................... 82
4.2.3 Competitive Advantages ............................................................................. 83

5  JORDAN RIVER PEACE PARK FINANCIAL/ECONOMIC FEASIBILITY ............... 84
5.1  Estimate the Total Investment (Capital) Requirements ...................................... 85
5.2  Expected Running Costs and Returns ............................................................... 86
5.3  Financial/Economic Analysis .......................................................................... 87
5.3.1 The Net Present Value (NPV): .................................................................... 90
5.3.2 Benefit-Cost Ratio (B/C): ............................................................................. 90
5.3.3 Internal Rate of Return (IRR): ..................................................................... 90
5.3.4 Sensitivity Analysis ....................................................................................... 91
5.4  Conclusions ..................................................................................................... 91

6  MANAGERIAL/ORGANIZATIONAL FEASIBILITY .............................................. 92
6.1  Principles of Integrated Management ............................................................... 92
6.2  Context of the Jordan River Peace Park Initiative .......................................... 93
6.3  Identification of Key Stakeholders ................................................................ 94
6.4  Governing Structure of Abdullah I/Rotenberg Peace Park Project ............... 95
6.5  Governance of the Jordan River Peace Park ................................................ 96
6.6  SWOT Analysis ................................................................................................ 97
6.7  Procedure for the Establishment of the Jordan River Peace Park ................. 98
6.8  Function of the Jordan River Peace Park ....................................................... 99
6.9  Institutional Mechanisms ................................................................................. 99
6.10 Proposed Management Goals ......................................................................... 100
6.10.1 Goal I: Use the Peace Park to Conserve Natural and Cultural Diversity .... 100
6.10.2 Goal II: Utilization as Model of Land Management and of Approaches to Sustainable Development .......................................................... 100
6.10.3 Goal III: Research, Monitoring, Education and Training .......................... 101
7 SECURITY PLAN

7.1 ACCESS CONTROL

7.2 ZONING OF THE PARK

7.2.1 Surveillance in Different Zones

7.3 TOURIST SAFETY

7.4 COMMUNITY EXPECTATIONS

7.5 LEGAL MATTERS

7.6 MANAGEMENT OF EMERGENCIES AND DISASTERS

7.7 RESPONSIBILITY OF SECURITY PROVISION

7.8 SECURITY WORKING GROUP/COMMITTEE

LIST OF TABLES

TABLE 1: MEAN MINIMUM, ABSOLUTE YEARLY MAXIMUM AND MEAN YEARLY TEMPERATURES FOR SELECTED CLIMATOLOGICAL STATIONS ALONG THE JORDAN RIVER VALLEY

TABLE 2: AVERAGE RAINFALL (MM/YEAR) ALONG THE JORDAN RIVER VALLEY

TABLE 3: WATER FLOW FOR DIFFERENT SOURCES

TABLE 4: SPRINGS DISCHARGE IN THE BASINS

TABLE 5: WATER LEVEL (M) AT MONITORING WELLS, 2006

TABLE 6: WATER QUALITY AT KING ABDULLAH CANAL

TABLE 7: PROVISIONS ON WATER ALLOCATION IN THE JORDAN ISRAELI PEACE TREATY

TABLE 8: OPTIONS FOR MEETING WATER NEEDS FOR THE LAKE

TABLE 9: RELEVANT JORDANIAN LEGISLATION

TABLE 10: RELEVANT ISRAELI LEGISLATION

TABLE 11: SCENARIO 1 – ESTIMATES OF WATER NEEDS FOR PHASED FILLING OF A CONSTANT AREA LAKE

TABLE 12: SCENARIO 2 – ESTIMATES OF WATER NEEDS FOR PHASED FILLING OF A VARIABLE AREA LAKE

TABLE 13: PROPOSED ENVIRONMENTAL ZONING

TABLE 14: HOTEL FACILITIES AND NUMBER OF WORKERS, 2007

TABLE 15: OVERNIGHT TOURISTS AND SAME DAY VISITORS BY MONTH, 2007

TABLE 16: OVERNIGHT AND SAME DAY VISITORS PER REGION

TABLE 17: NUMBER OF INTERNATIONAL VISITORS IN ISRAEL BY MONTH

TABLE 18: REVENUES FOR TIBERIAS AREA

TABLE 19: NUMBER OF TOURISTS IN TIBERIAS

TABLE 20: INVESTMENT COSTS OF THE PEACE PARK (PHASES I & II)

TABLE 21: ANNUAL RUNNING COSTS OF THE JORDAN RIVER PEACE PARK (PHASE I & II)


TABLE 23: CASH FLOW FOR THE PEACE PARK – PHASE II (2020-20)

TABLE 24: RESULTS OF THE SENSITIVITY ANALYSIS SCENARIOS

TABLE 25: SWOT ANALYSIS
LIST OF FIGURES

FIGURE 1. JORDAN RIVER PEACE PARK PROPOSED BOUNDARIES .............................................................. 10
FIGURE 2. JORDAN RIVER PEACE PARK MASTER PLAN ............................................................................. 11
FIGURE 3. PROPOSED ZONES OF ACTIVITY ............................................................................................... 12
FIGURE 4. MIGRATORY BIRDS ROUTE ........................................................................................................... 15
FIGURE 5. PROPOSED PROJECT AREA IN RELATION TO NORTHERN JORDAN VALLEY IBA ................ 16
FIGURE 6. PROPOSED PROJECT AREA IN RELATION TO WADI YARMOUK IBA ..................................... 16
FIGURE 7. WINTERING CORMORANTS .......................................................................................................... 17
FIGURE 8. PIED KINGFISHER ......................................................................................................................... 17
FIGURE 9. SMYRNA KINGFISHER ................................................................................................................. 17
FIGURE 10. ZIZIPHYS SPP  FIGURE 11. TAMARIX SPP .................................................................................... 20
FIGURE 12. TYPHA SPP  FIGURE 13. INTRODUCED EXOTIC EUCALYPTUS ............................................ 20
FIGURE 14. EGYPTIAN FRUIT BATS INSIDE THE POWER STATION BUILDING ................................... 22
FIGURE 15. POLICE STATION BUILDING ...................................................................................................... 27
FIGURE 16. ZONING PLAN 9579 .................................................................................................................. 28
FIGURE 17. ZONING PLAN 1591 – LAND USAGE ......................................................................................... 30
FIGURE 18. YARMOUK DAM, 1929 ............................................................................................................... 33
FIGURE 19. WORKERS’ HOUSING; HISTORICAL PHOTO AND PRESENT DAY CONDITION ...................... 33
FIGURE 20. POWER PLANT; HISTORICAL PHOTO AND PRESENT DAY CONDITION .............................. 34
FIGURE 21. SITE PLAN COMPILED USING THE ARCHIVE DRAWINGS ....................................................... 34
FIGURE 22. TRAIN STATION ......................................................................................................................... 35
FIGURE 23. COMMEMORATION OF HATFIN BATTLE .................................................................................. 36
FIGURE 24. GROUNDWATER BASINS AND DIRECTION OF GROUNDWATER MOVEMENT .................... 38
FIGURE 25. PROPOSED ENTRANCES TO THE PEACE PARK ................................................................. 55
FIGURE 26. LOCATION OF EXISTING AND PROPOSED SITE FACILITIES ................................................ 56
FIGURE 27. PROPOSED SITE FACILITIES .................................................................................................... 60
FIGURE 28. LEGEND FOR THE MAP SHOWING PROPOSED FACILITIES ................................................... 60
FIGURE 29. ECO-LODGES BEFORE AND AFTER RENOVATION .............................................................. 61
FIGURE 30. BICYCLE SHOP PLAN AND ELEVATION, AFTER RENOVATION ........................................... 63
FIGURE 31: BICYCLE SHOP BEFORE AND AFTER RENOVATION ............................................................ 63
FIGURE 32. PANORAMIC TERRACE BEFORE AND AFTER RENOVATION .................................................. 65
FIGURE 33. VISITOR CENTER AT POWER STATION .................................................................................... 66
FIGURE 34: ART WORKSHOP BEFORE AND AFTER RENOVATION .......................................................... 67
FIGURE 35: ART WORKSHOP AFTER RENOVATION, ELEVATION ............................................................ 67
FIGURE 36: ART WORKSHOP AFTER RENOVATION PLANS .................................................................. 68
FIGURE 37. VISITORS CIR ............................................................................................................................. 68
FIGURE 38. WORLD TOURIST ARRIVALS ..................................................................................................... 69
FIGURE 40. PROCESS OF ESTABLISHING GOVERNING STRUCTURE ..................................................... 95
FIGURE 41. PREPARATION OF THE MANAGEMENT PLAN ....................................................................... 96
FIGURE 42. WARNING SIGN IN NAHARYIM ................................................................................................. 104
ACRONYMS AND/OR ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>MOE</td>
<td>Ministry of Environment</td>
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<tr>
<td>MOA</td>
<td>Ministry of Agriculture</td>
</tr>
<tr>
<td>MOWI</td>
<td>Ministry of Water and Irrigation</td>
</tr>
<tr>
<td>WAJ</td>
<td>Water Authority of Jordan</td>
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<tr>
<td>JVA</td>
<td>Jordan Valley Authority</td>
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<tr>
<td>RSCN</td>
<td>Royal Society for the Conservation of Nature</td>
</tr>
<tr>
<td>JSSD</td>
<td>Jordanian Society for Sustainable Development</td>
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<tr>
<td>FOEME</td>
<td>Friends of the Earth Middle East</td>
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<tr>
<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities, Threats</td>
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<tr>
<td>IBA</td>
<td>Important Bird Area</td>
</tr>
<tr>
<td>B/C</td>
<td>Benefit /Cost</td>
</tr>
<tr>
<td>IRR</td>
<td>Internal Rate of Return</td>
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<tr>
<td>ABC</td>
<td>Activity Based Cost</td>
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<tr>
<td>NPV</td>
<td>Net Present Value</td>
</tr>
<tr>
<td>BCR</td>
<td>Benefit Cost Ratio</td>
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<tr>
<td>MCM</td>
<td>Million Cubic Meters</td>
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1 Introduction

The proposed project, initiated by the municipalities of Muaz Bin Jabal (Jordan), Jordan Valley Regional Council (Israel) and Beit Shean Regional Council (Valley of Springs Regional Council) (Israel) in collaboration with EcoPeace / Friends of the Earth Middle East, aims at creating a joint natural and cultural heritage peace park on both banks of the Jordan and Yarmouk River from Bakoura/ Naharyim to the Three Bridges site at 'Jisr al-Majami'/ Gesher.

The project site will include the conservation of the Rotenberg hydroelectric power plant and water system, at the juncture of the Lower Jordan and Yarmouk Rivers. In addition to rehabilitating the old homes of the workers and supervisors of the plant and repairing the old Rotenberg power plant building and adapting it into to a visitor's center, the project involves flooding the currently dry lake bed of the Rotenberg project and restoring the natural habitat of the Rivers. The area offers a natural habitat for a rich diversity of native fauna and flora and its rehabilitation will attract large numbers of migrating birds thus creating a unique eco-tourism attraction for international and local tourists visiting the site from both Jordan and Israel. The park will augment efforts to preserve the wetland fauna and flora of the Jordan River Valley, much of which is currently under threat of extinction.

1.1 Objectives of the Study

Objectives of the study are as following:

- Assess the potential of developing the area into the Jordan River Peace Park;
- Assess the feasibility of the project;
- Propose conceptual directions for rehabilitation and development of the site.

1.2 Scope of the Study

The present study is a pre-feasibility study, conducted in order to assess the viability and feasibility of the establishment of the Jordan River Peace Park.

The scope of the study encompasses the following:

- Preliminary definition of the proposed Peace Park boundaries;
- Findings of the Charrette Event conducted by Yale University in cooperation with Jordanian and Israeli architectural teams;
- Situational Analysis of the area;
- Conceptual design for rehabilitation of the area;
- Market Analysis;
- Financial Feasibility;
- Managerial Issues;
- Security Plan.

Upon approval of the pre-feasibility report a conceptual business plan will be prepared.
2 Project Concept

The establishment of the Jordan River Peace Park as a trans-boundary park is a visionary pilot project unique to the Middle East, aiming to contribute to the rehabilitation of the Lower Jordan River by establishing a base for cooperative conservation and preservation activities.

The goals of establishment of the Peace Park can be defined as following:

- Conserve natural and cultural diversity;
- Create a model of sustainable development land management approaches;
- Research, monitoring, education and training activities.

2.1 Project Stages

The long term vision of the beneficiaries is to establish a cross-border park stretching across both banks of the Jordan and Yarmouk Rivers linking the areas of Bakoura, Peace Island, 'Jisr al-Majami' Gesher and Naharyim through an integrated development plan. However, due to financial limitations, security, and political considerations, it is proposed that the adaptation of the site be carried out in three phases.

The first phase would involve the renovation of the eco-lodges, rehabilitation of the proposed lake area, landscape rehabilitation, and the establishment of walking and biking trails, including trails overlooking the hydro electric plant. Entry to Jordan River Peace Park in Phase I would be restricted to the Jordanian side and certain areas of the site would be fenced off for security and safety reasons. Facility developments on the Israeli side at 'Jisr al-Majami' Gesher and Naharyim would take place concurrently.

Phase II would see the rehabilitation of the power station, pressure tank, and transformer buildings.

Phase III would include connecting both river banks, renovating the Three Bridges, linking trails and railway tracks, and establishing entry points from both Jordan and Israel. The draft master plan developed during the May 2008 design workshop (Charrette) envisioned an expanded Israeli side of the Park, equal to that of the Jordanian side; creating a total area of approximately 4000 dunam on each side.

Figures below show the proposed boundaries for the Peace Park, Peace Park Master Plan and proposed zones of activity within the Peace Park, provided by the Yale University Team during the Charrette event held in Israel and Jordan in May 2008.
Figure 1. Jordan River Peace Park Proposed Boundaries
Figure 2. Jordan River Peace Park Master Plan
Figure 3. Proposed Zones of Activity
3 Analysis of the Current Situation

3.1 Study Approach

In order to provide a comprehensive and concise analysis of the current situation in the proposed project area and adjacent areas the following approach was applied:

- **Literature review**: Review, compilation and analysis of available information on the environmental, socio-economic, and water resources, as well as the cultural and historical issues related to the project area.

- **Field visits**: A number of field visits were conducted, during which photographic surveys and visual assessments of relevant locations were performed.

- Preliminary *presentation of the project* to potential stakeholders was held on February 4, 2008.

- A number of *brain-storming sessions* conducted by the pre-feasibility study team.

- *Charrette event* conducted by the Yale University team in cooperation with Israeli and Jordanian experts was held May 11-15, 2008.

The section below provides a comprehensive analysis of the current situation in the proposed project area.

3.2 Natural Resources and Environmental Overview

3.2.1 Physical Features

The proposed area of the Jordan River Peace Park represents an important and pristine part of the Jordan River Valley. The area's status as a military zone along the borders of Jordan and Israel has limited public access and enabled nature to thrive.

The Jordan River Valley has a mainly sub-tropical climate, with mild winters and very hot summers. Annual average temperatures vary around mid twenties degrees and can exceed 48 °C in summer, while temperatures during the winter nights might fall below 15°C. Table 1 presents the mean minimum, absolute yearly maximum and the mean yearly temperature from selected climatological stations along the Jordan River Valley.
Rainfall within the Jordan River Valley area varies with a general decreasing trend from the north to the south as seen in the table below.

Table 2: Average Rainfall (mm/year) along the Jordan Valley

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</tr>
</thead>
<tbody>
<tr>
<td>Baqoura</td>
<td>93.2</td>
<td>71.9</td>
<td>59.9</td>
<td>22.9</td>
<td>5.2</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>11.4</td>
<td>46.5</td>
<td>82.1</td>
<td>394</td>
</tr>
<tr>
<td>Deir Allah</td>
<td>61.5</td>
<td>53.9</td>
<td>46.1</td>
<td>15.1</td>
<td>3.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.3</td>
<td>8.1</td>
<td>36.5</td>
<td>53.7</td>
<td>281.9</td>
</tr>
</tbody>
</table>

The mean yearly relative humidity is an average of 65% in the Bakoura area.

3.2.2 Environmental Features

The area of the proposed Jordan River Peace Park is characterized by a unique combination of arid and semi-arid habitats as well as wetland habitats in the vicinity of the Jordan and Yarmouk Rivers and their riparian habitats; thus the entire area contains a large diversity of flora and fauna. The proposed flooding of the dried lake area will create an additional wetland habitat and is expected to attract additional wildlife, mostly avifauna, consisting of migratory and resident birds.

As part of the Great Rift Valley, the area has an ornithological importance as part of the major routes for annual bird migrations between Asia and Europe and Africa. The area serves as a refueling stop during the fall migration to Africa, and gives a glimpse of greenery and promising food for exhausted birds on their way to nesting grounds up north during spring migration.

---

1 Jordan Meteorology Department, 2005
It is estimated that no less than 500 million birds from 390 different species migrate twice a year over the Great Rift Valley.

The site was identified by BirdLife International and RSCN as an Important Bird Area (RSCN 2000). *Important Bird Areas (IBA)* are sites providing essential habitat to one or more species of breeding, wintering, and/or migrating birds. The sites vary in size but are usually discrete and distinguishable in character, habitat, or ornithological importance from surrounding areas. The proposed project area (Bakoura) is actually within the Northern Jordan Valley IBA (see Figure 5) and comprises the NW part of this IBA. It is also 12 km away to the SW of Wadi Yarmouk IBA (see Figure 6).
Figure 5. Proposed Project Area in Relation to Northern Jordan Valley IBA (Outlined in Blue)

Figure 6. Proposed Project Area in Relation to Wadi Yarmouk IBA (Outlined in Blue)
The following bird species were observed during the site visits: Cormorant, Cattle Egret, Little Egret, Grey Heron, Mallard, Black Kite, Marsh Harrier, Sparrow hawk, Kestrel, Chukar, Coot, Collared Dove, Ring-necked Parakeet, Barn Owl, Smyrna Kingfisher, Pied Kingfisher, White Wagtail, Yellow-vented Bulbul, Robin, Graceful Warbler, House Sparrow, and Chaffinch.

Large numbers of Cormorants and Grey Herons were observed in a very short period of time, indicating that the area is an important wintering ground for water birds.
3.2.3 Biological Resources

The section below provides a general description of the biological resources in the area compiled from the readily available sources of information. It is recommended that a comprehensive research project should be undertaken in order to provide a concise inventory of the floral and fauna species that actually exist in the area as well as their current status. The inventory would serve as a guide for setting the priorities for biodiversity conservation, as well as determining a set of guidelines on re-vegetation of the area in order to avoid the introduction of exotic invasive species that could pose a threat to environmentally sensitive areas within the Park.

3.2.3.1 Flora

The area from the Yarmouk River to the Dead Sea is characterized by a semi-arid and arid Mediterranean, warm bioclimate. The main vegetation types include Mediterranean, Irano-Turanian, Sudanian and Saharo Arabian. As mentioned above, the status and density of species and their actual presence in the Park are unclear and need further research.

The area of the proposed Park also includes a deciduous oak forest, with remaining original patches, located mainly around the Yarmouk Basin in the north. The area's restricted nature has enabled a much denser vegetation cover than areas to the south. The main vegetation consists of trees, shrubs and herbaceous bushes as follows:

- *Querqus ithaburensis*  
- *Stryx officinale*  
- *Ceratonia seliqua*  
- *Pistashia palaestina*

Exotic species of plants such as *Pinus halepensis*, *Eucleptus spp.*, *Accacia lancifolia*, *Syperuss spp.* and others have been planted along the road sides from Deir Allah to Al Himma.

Shrubs growing on the mountain tops and beside the Yarmouk River include:

- *Crataegus azarolus*  
- *Olea europaea*  
- *Amygdalus spp.*  
- *Calycotone villosa*  
- *Rhamnus palaestinus*  
- *Retama raetum*

Herbaceous bushes include:

- *Dactylis glomerata*  
- *Sarcopoterium Spinosum*  
- *Urginea maritima*  
- *Euphorbia heirosolymitana*  
- *Carlina corymbosa*  
- *Salvia spp.*  
- *Poa bulbosa*  
- *Alcea spp.*  
- *Colchicum spp.*  
- *Tulipa spp.*
Mediterranean Non-Forest vegetation:

Areas of Mediterranean Non-Forest vegetation are primarily located around the valleys that flow east-west. These areas have been exposed to tremendous pressure from over-grazing and are rapidly degrading. Species include:

- Rhamnus palaestinus
- Echinops spp.
- Dactylis glomerata
- Tercium polium
- Ononis natrix
- Poa bulbosa
- Tymus lactiatus
- Calycotome vilosa
- Asparagus aphyllus

- Capparis spinosa
- Sarcopoterium spinosum
- Hordeum bulbosum
- Varrhemia iphionoidea
- Ballota indulata
- Eryngium glomeratum
- Noea mucronata
- Asphodelus microcarpus

Steppe vegetation is confined to the Irano-Turanean region on hills around the Jordan and Yarmouk Rivers but due to extensive farming and over-grazing many types have declined. Areas inhabited with steppe vegetation are characterized by the absence of trees, and tend to be dominated by shrubs and bushes including:

- Ziziphus lotus
- Noea muronata
- Tamarix spp.
- Urginea maritima
- Ferula communis
- Gypsophila arabica
- Astragalus spinosa
- Crocus moabiticus

- Artemisia herba-alba
- Retama raetum
- Asphodelus microcarpus
- Anabasis syriaca
- Hammad spp.
- Salsola spp.
- Capparis decida

The Jordan, Yarmouk, and Zarqa Rivers and most of the wadis that flow towards Jordan Valley are mainly inhabited by water vegetation plants, such as hydrophytic vegetation which grow wholly or partially in water and include:

- Salix spp.
- Phragmitis communis
- Vitex angus-castus
- Cyperus longus

- Tamarix spp.
- Typha anguata
- Nerium oleander

Halophytic vegetation is confined to the southern areas of the valley, north of the Dead Sea area, around the Jordan River shoulders and mainly in areas of saline springs such as Wadi Abu Al-Zigan and include the below species:

- Nitraria retusa
- Suaeda spp.

- Frankenia pulverulenta
- Aeluropus littoralis
There is some tropical vegetation present from the areas south of Deir Allah to the Dead Sea including:

- *Ziziphus spina-cristi*
- *Forsskaolea tenacissima*

Flora species listed above could serve as the foundation for a comprehensive research and inventory of species existing in the area of the Jordan River Peace Park. Figures below show some of the Park's flora species.

**Figure 10. Ziziphus spp**

**Figure 11. Tamarix spp.**

**Figure 12. Typha spp.**

**Figure 13. Introduced Exotic Eucalyptus**
3.2.3.2 Fauna
The fauna of the area has greatly declined over the last fifty years primarily due to farming and overgrazing. The majority of the original fauna does not exist in the vicinity of the valley any longer but only in marginal areas of the river or around dams, and in deserted saline areas.

The Jordan and Yarmouk Rivers and the smaller wadis still host many indigenous species of fish and aquatic fauna but due to the overuse of chemicals and shortage of water the densities of these species have declined sharply. Fresh water Ictheofauna thought to inhabit the area include: Tillapia galilae, Barbus canis, Barbus longiceps, Coptoeta damascena, Aeanthobrama essneri, Gara rufa, Hemigrammacopoea nana, Claris lazera and Aphanius cypris. The status of many of the above mentioned fish species is not known and further studies should be initiated. Several exotic species of fish were introduced in these surface water bodies such as Tilapia spp., Blennis fluviatilis, Mugil cephalus, and Cyprinus carpio (Al-Abssi, 1987).

The Reptilian and Amphibian species are confined to dense vegetation areas, rich in water, such as running wadis, river banks and some dam areas. Such species include:

<table>
<thead>
<tr>
<th>Amphibians</th>
<th>Reptiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Green Tree Frog</em></td>
<td><em>Common Agama</em></td>
</tr>
<tr>
<td><em>March Frog</em></td>
<td><em>Starred Agama</em></td>
</tr>
<tr>
<td><em>Fresh water Turtle</em></td>
<td><em>Bridged Skink</em></td>
</tr>
<tr>
<td></td>
<td><em>Chameleon</em></td>
</tr>
<tr>
<td></td>
<td><em>Lobe Footed Gecko</em></td>
</tr>
<tr>
<td></td>
<td><em>Elegant Lizard</em></td>
</tr>
<tr>
<td></td>
<td><em>Egyptian Sand Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>European Whip Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Spotted Whip Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Tessellated Water Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Palestine Water Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Scaled Viper</em></td>
</tr>
<tr>
<td></td>
<td><em>Black Desert Cobra</em></td>
</tr>
<tr>
<td></td>
<td><em>Forscal’s Sand Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Mueller’s Ground Viper</em></td>
</tr>
<tr>
<td></td>
<td><em>Simon’s Worm Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Hook billed Blind Snake</em></td>
</tr>
<tr>
<td></td>
<td><em>Phillips Worm Snake</em></td>
</tr>
</tbody>
</table>

The Yarmouk and Jordan Rivers still host many mammals in the vicinities of their river banks. Many carnivores and other mammalian species have managed to survive because
access to the area has been limited due to military restrictions. However, the presence and status of a number of species in the Park is unclear and needs further research. It is possible, after thorough research, that some of the species could be reintroduced if conditions are appropriate.

Any development would directly affect the remaining populations of such mammals. The mammals of the Jordan River Valley include (Amer, 1995):

Mammals

<table>
<thead>
<tr>
<th>Species</th>
<th>Scientific Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Hedgehog</td>
<td>Erinaceus europaeus</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Lesser White-toothed Shrew</td>
<td>Crocidura monacha</td>
<td>Zarqa River</td>
</tr>
<tr>
<td>Egyptian Fruit Bat</td>
<td>Rousettus aegypticus</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Greater Rat-tailed Bat</td>
<td>Rhinopoma microphyllum</td>
<td>Zarqa River</td>
</tr>
<tr>
<td>Greater Horseshoe Bat</td>
<td>Rhinolopus ferrumequinum</td>
<td>Zarqa River</td>
</tr>
<tr>
<td>Common Mouse</td>
<td>Musculus</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Golden Spiny Mouse</td>
<td>Acomys russatus</td>
<td>Deir Allah</td>
</tr>
<tr>
<td>Common Rat</td>
<td>Rattus rattus</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Palestine Mole Rat</td>
<td>Spalax leucodon</td>
<td>Yarmouk</td>
</tr>
<tr>
<td>Indian Crested Porcupine</td>
<td>Hystrix indica</td>
<td>Yarmouk</td>
</tr>
<tr>
<td>Egyptian Dungeon</td>
<td>Herpestes ichneumon</td>
<td>Jordan River</td>
</tr>
<tr>
<td>Marbled Pole-cat</td>
<td>Vormela peregusna syriaca</td>
<td>Yarmouk</td>
</tr>
<tr>
<td>European Badger</td>
<td>Meles meles</td>
<td>Yarmouk</td>
</tr>
<tr>
<td>Stone Marten</td>
<td>Martes Foina</td>
<td>Kafrein Dam</td>
</tr>
<tr>
<td>Honey Badger</td>
<td>Millivora capensis</td>
<td>Yarmouk</td>
</tr>
<tr>
<td>Red Fox</td>
<td>Vulpes vulpes</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Jungle Cat</td>
<td>Felis chaus</td>
<td>Jordan River</td>
</tr>
<tr>
<td>Striped Hyena</td>
<td>Hyaena hyaena</td>
<td>Wadi Damia</td>
</tr>
<tr>
<td>Grey Wolf</td>
<td>Canis Lupus</td>
<td>Yarmouk</td>
</tr>
<tr>
<td>Wild Cat</td>
<td>Felis silvestris</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Common Otter</td>
<td>Lutra lutra</td>
<td>Jordan River</td>
</tr>
<tr>
<td>Wild Boar</td>
<td>Sus scrofa</td>
<td>Jordan Valley</td>
</tr>
<tr>
<td>Rock Hyrax</td>
<td>Procavia capensis</td>
<td>Yarmouk</td>
</tr>
</tbody>
</table>

Figure 14. Egyptian Fruit Bats inside the Power Station Building
3.2.4 Avifauna

Due to the richness of surface water in the Jordan Valley and its location on one of the globe's most significant migratory flyways the area is one of the most important bird areas in Jordan. However not all the wadis host high levels of avifauna as a result of excessive farming, hunting and constant disturbance to wildlife (Budieri, 1995). The key areas along the JRV are:

The Yarmouk water bodies with their dense concentration of vegetation, such as Phragmites communis, Typha angusta and other hydrophitic plants, attract many local and migrant water fowl to breed and roost in the area. The main importance of the Yarmouk Basin is the recorded existence of the Brown Fish Owl (Ketupa zeylonesis), a globally threatened species and the vulture Gyps fulvus (Evans, 1994). Many other important waterfowl inhabit the Yarmouk Basin all year round such as:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griffon Vulture</td>
<td>Gyps fulvus</td>
<td>Resident, Threatened</td>
</tr>
<tr>
<td>Kestrel</td>
<td>Falco tunnunculus</td>
<td>Resident</td>
</tr>
<tr>
<td>Lesser Kestrel</td>
<td>F. naumann</td>
<td>Resident</td>
</tr>
<tr>
<td>Short-toed Eagle</td>
<td>Circaetus gallicus</td>
<td>Resident</td>
</tr>
<tr>
<td>Levant Sparrow Hawk</td>
<td>Accipiter brevipes</td>
<td>Spring migrant</td>
</tr>
<tr>
<td>Montagu’s Harrier</td>
<td>Circus pygargus</td>
<td>Spring, fall migrant</td>
</tr>
<tr>
<td>Levant Sparrow Hawk</td>
<td>Accipiter gentilis</td>
<td>Spring migrant</td>
</tr>
<tr>
<td>Black Kite</td>
<td>Milvus migrans</td>
<td>Spring, Fall Migrant</td>
</tr>
<tr>
<td>Chukar</td>
<td>Alectoris chukar</td>
<td>Common</td>
</tr>
<tr>
<td>Water Rail</td>
<td>Rallus aquaticus</td>
<td>Winter migrant</td>
</tr>
<tr>
<td>Little Swift</td>
<td>Apus affins</td>
<td>Resident</td>
</tr>
<tr>
<td>Smyrna King Fisher</td>
<td>Halcyon smyrnensis</td>
<td>Resident</td>
</tr>
<tr>
<td>Black Start</td>
<td>Cercomela melanura</td>
<td>Resident</td>
</tr>
<tr>
<td>Rock Dove</td>
<td>Streptopelia decaocto</td>
<td>Common, Resident</td>
</tr>
<tr>
<td>Brown Fish Owl</td>
<td>Ketupa zeylonesis</td>
<td>Threatened</td>
</tr>
<tr>
<td>Sand Partridge</td>
<td>Ammoperdix heyi</td>
<td>Resident</td>
</tr>
<tr>
<td>Finch Wheatar</td>
<td>Oenanthe finschii</td>
<td>Winter visitor</td>
</tr>
<tr>
<td>Orange tufted Sunbird</td>
<td>Nectarinia Osea</td>
<td></td>
</tr>
</tbody>
</table>

The Jordan River’s water body and its attributes are also important to Jordanian birdlife due the richness of the river in aquatic life. Its main Avifauna are:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle Egret</td>
<td>Bublus ibis</td>
<td>Non-breeding resident</td>
</tr>
<tr>
<td>Little Egret</td>
<td>Egretta garzetta</td>
<td></td>
</tr>
<tr>
<td>Great White Egret</td>
<td>Egretta alba</td>
<td>Winter visitor, spring migrant</td>
</tr>
<tr>
<td>Grey Heron</td>
<td>Ardea cinerea</td>
<td>Migrant</td>
</tr>
<tr>
<td>Mallard</td>
<td>Anas platyrhynchos</td>
<td>Breeds on Jordan River</td>
</tr>
<tr>
<td>Marbled Duck</td>
<td>Marmaronetta angustriothris</td>
<td>Globally Threatened</td>
</tr>
<tr>
<td>Blue Rock Thrush</td>
<td>Monticola solitarius</td>
<td>Resident</td>
</tr>
<tr>
<td>Cettis Warbler</td>
<td>Cettia cettia</td>
<td>Resident</td>
</tr>
<tr>
<td>Olivaceous Warbler</td>
<td>Hippolais pallida</td>
<td>Spring, fall migrant</td>
</tr>
<tr>
<td>Woodchat Shrike</td>
<td>Laniux senator</td>
<td>Summer visitor</td>
</tr>
<tr>
<td>Hooded Crow</td>
<td>Corvus cornix</td>
<td>Resident</td>
</tr>
</tbody>
</table>
Jordan River Peace Park Pre-Feasibility Study

Long-eared Owl Asio otus Winter visitor
Pied Kingfisher Ceryle rudis Resident
Common Kingfisher Alcedo atthis Winter visitor
Blue-cheeked Bee-eater Merops superciliosus Spring migrant
Hoopoe Upupa epops Spring migrant
Black Francolin Francolinus francolinus Locally endangered
Coot Fulica atra Winter visitor
Little Ringed Plover Charadrius dubius Spring migrant
Yellow legged Gull Larus cadinnaus Winter, spring migrant
Collared Dove Streptopelia decaocto Resident
Honey Buzzard Pernis apivorus Spring, fall migrant
Griffon Vulture Gyps fulvus Regionally threatened
Spur-winged Plover Holopterus spinosus Resident
Common Sandpiper Actitis hypoleucos Spring, fall migrant
Green Shank Tringa nebularia Spring, fall migrant

3.2.4.1 Agriculture

Agricultural activities in the vicinity of the proposed Peace Park could be described as arid-irrigated agriculture consisting mainly of citrus orchards and cereal farming. Thorough analysis of agricultural practices should be conducted due to the fact that such activities could be associated with soil erosion and water and soil pollution from agricultural runoff of pesticides and fertilizers.

3.3 Socio-Economic, Historical and Cultural Resources

3.3.1 Adjacent Israeli Areas

The areas adjacent to the proposed Jordan River Peace Park on the Israeli side are under the jurisdiction of the Jordan Valley Regional Council and the Beit Shean Regional Council (Valley of Springs Regional Council).

The primary economic sectors in the area include agricultural and tourism based activities. Tourism resources include:

- Existence of qualified service industries
- Existing capacity for further tourist development
- Well-developed tourist infrastructure (17 restaurants and/or rest-houses in close proximity to the Naharyim site)
- Well-developed infrastructure (roads, telecommunications, waste-collection, sewage, water, etc.)
3.3.1.1 Old Gesher Site²

The Old Gesher Site is managed by the "Gesher Community Center", an NGO composed of managers from the Gesher Kibbutz. The tourist site offers 3 different attractions:

- **The Old Gesher yard** – Tells the story of the Jewish settlement in the area dating from the beginning of the previous century, especially the battle for the Gesher Kibbutz. The site has been undergoing extensive rehabilitation and preservation, and today it has become one of the main educational centers in the area. The entrance fee for an adult is 27 NIS and for an organized group is 23 NIS per person. Nearly 50,000 people visit the site every year. The site offers many attractions for visitors: such as a new model that illustrates the operations of the historical power plant in Naharyim. Visitors enjoy a light-and-sound show, water-flow displays and more. An old museum displays the bunker that served the members of the Kibbutz during the War of Independence. A light-and-sound show depicts the story of the Kibbutz's member's endurance during the war. In addition, visitors can enjoy a new display of a historical train engine that was brought to the site recently.

The presentation provided viewed by the pre-feasibility team has a strong political orientation focused exclusively on the Israeli narrative of the site. It is recommended by the team that the presentation content be evaluated as to its content and effectiveness in conveying a complex, multi-cultural narrative.

A variety of tours are offered between the Jordan and the Yarmouk Rivers to a set of dams and tunnels which transported water to the Rotenberg's power plant. One of the most popular tours includes an hour boat ride to the Island where visitors can look out upon the abandoned settlement of Tel Or and visit the station of the Valley train. Many visitors continue to the "Dam trail" – a winding trail that runs parallel to the Yarmouk River and is open throughout the year.

Next to these sites, there are two tourist attractions that are open to the public free of charge: The Kochava Hill is an observatory that overlooks Peace Island. The Garden of Statues contains numerous statues composed of rock and iron.

- **The Three Bridges** - The Old Gesher site is situated on one of the region's historic overland routes at the area's main crossing point over the Jordan River. Three major bridges were constructed at this point. The first bridge, built during the Roman period, connected the Decapolis cities of Beit Shean/ Scythopolis on the western side of the Jordan River and the city of Umm Qais/ Gadara on the eastern side. During the fourteenth century, the Mamluks renovated the Roman Bridge and added a Khan on the ancient road to better control the crossing and provide services for passing caravans (see below). The Hejaz railway system, completed in the region at the beginning of the twentieth century, was initiated by order of

² http://www.naharayim.co.il/about.asp
the Ottoman Sultan Abdul Hamid II, under the supervision of German engineers. The railway’s initial objective was to link the Ottoman Empire with the Holy Cities of the Arabian Peninsula, transporting Muslim pilgrims to Mecca and Medina. Later, tracks were extended to join the port city of Haifa to the Syrian town of Dra’a, with many stations established along the route, including the historical railroad bridge over the Jordan River at Gesher/ 'Jisir al-Majami’. During the British Mandate Period, a paved road bridge, Taggert fort, customs house and quarantine were built at Gesher/ 'Jisir al-Majami’, further reinforcing the political, military and economical importance of the region's historical crossing.

- **The Mamluk Khan** – The Mamluk period Khan was built in the 14th century, as part of a network of Khans which served travelers and traders as secure stations along the main training routes of throughout the region. This specific Khan was extremely important since it guarded the area's main crossing point over the Jordan River. The Khan was destroyed by several earthquakes that hit the area and in the years that followed it was covered by accumulating sediment. At the time of the signing of the peace treaty between Jordan and Israel the site was excavated for three seasons (from the end of 1993 until mid 1995). The excavation revealed numerous rooms. In the reconstruction of the site by the Society for Preservation of Israel's Heritage Sites, part of the main yard and the water trough were reconstructed. The Khan consists of five levels: two levels above the ground, a middle level and two lower levels. A wide staircase allows descent to an eight meter shaft connected to the Jordan River by a tunnel.

The three bridges and Mamluk Khan are located within the military zone and coordination with the army is handled by the site operators.

- **The Old Police Building** – Near the site of Old Gesher, and within its planning zone is a large police building that was built during the Second World War and began to function as a border and customs police station in 1944. It is located at a strategic point near the three bridges that supported the main traffic between the Mediterranean Sea area and the east bank of the River Jordan. Today the site serves as a training zone for the Israeli army and is closed to the public a few days a year for military purposes but is open for the public the rest of the time. The building has simple though good quality characteristics: water pipes and sanitation are located on the roof of the building; ventilation pipes, on the roof of the building, are built with precise slopes to prevent future floods; the front of the building is mostly pock-marked by bullets due to the constant training of the army in the vicinity.
A plan to preserve and develop the Old Police Building has been drawn up by Architect Amir Shoam by order of the Jordan Valley Regional Council, Kibbutz Gesher and the Society for Preservation of Israel's Heritage Sites. The plan is divided into three main stages:

- **Immediate actions**: Reorganization of the training area in a way that will isolate training within a smaller area of the complex. Renovation of specific areas of the building to minimize the deterioration of the site (mostly due to rain and poor infrastructure).
- **Intermediate actions**: Clearing any garbage or unwanted vegetation from the complex and repairing part of the ceiling in order to stop further deterioration.
- **Long term actions**: Implementation of sustainability in future development plans. There is a need to preserve the historical, ecological and scenic aspects but there is no program for adaptive use yet.

There is also a need for a complete plan for the complex’s full rehabilitation (elevators, air-conditioning, electricity, communication, illumination and safety). Such a plan should describe operational methods that will be used to preserve the historical and cultural significance of this site.

Currently there is only one approved zoning plan (9579) that outlines the allowed uses of the area near 'Old Gesher' and the two nearby historic sites: the Old Police Building and the Khan. The plan divides the area into seven major zones:

1. **Antiquity reconstruction zone**: contains an area of approximately 26.2 dunams that allows for both excavation and tourism (A restaurant and souvenir shop).

2. **The Old Gesher Yard**: Contains an area of approximately 13.8 dunams. According to the plan this area consists of the Gesher Museum. As of today this area is already developed.

---

3 "Police complex's preservation plan" – Architect Shoam Amir.
3. **Vacation services**: Consists of nearly 3.1 dunams. The plan allows for the building of commercial structures – a marine sport shop and food shops for the visitors.

4. **Open private zone**: Consists of nearly 50 dunams. In this area construction of any building will be restricted. The only construction that will be allowed will be sports related or facilities for picnics or infrastructure.

5. **Open public zone**: Consists of nearly 9 dunams. The only construction that will be allowed in this zone is infrastructure.

6. **Railroad track**: The old train track that in the past led to Damascus, uses 16 dunams of land, as set aside in the plan. Its route will be changed only when a new track is planned according to the need of the train company.

---

**Figure 16. Zoning Plan 9579**
3.3.1.2 Naharyim Site

The site is managed by "Ashdot tourism & development L.T.D", a company that is composed of representatives of the two Ashdot Ya'acov Kibbutzim. The company is the only body that manages and coordinates visits to the “Island”.

Beside the many attractions that characterize this area, tourists can choose from three main attractions:

1. The **Hill of Memorial**, a memorial site in remembrance of the seven students that were murdered on the Island of Peace on the 13\(^{th}\) of March, 1997. It is estimated that nearly 150,000 tourists visit this attraction every year.

2. The **Dam Trail** leads visitors on a walking route that overlooks the Yarmouk River from the bridge over the "Zero Gradient Tunnel". The Zero Gradient Tunnel is a 1,700 meter long cement tunnel that was used by Rotenberg to divert water from the Jordan River. The trail is approximately two kilometers long.

3. The departure point to the Island is located nearly 40 meters from the border gate. Tourists who embark from Israel pass via the Beily Bridge and onto the island, where the Peace Treaty between Israel and Jordan was signed. Visitors can also see the Rotenberg power plant site.

As a result of the specific chapter in the peace treaty, the necessary procedures to allow an organized group of tourists into the site are quite simple. A group of tourists arrive at the site’s office must register their names, and provide their I.D. and car / bus number. Coordination with the army is very efficient and simple. When a group is ready to visit the “Island” the company representative calls the responsible army official, informs him of the size of the group and receives approval. From this point the company needs no further authorization. Finally, the Israeli army correspondent contacts his Jordanian counterpart and informs him of the incoming group.

An average visit lasts nearly an hour. Visitors usually continue to the Dam Trail and hike for another 20 to 30 minutes. Between 1,000 to 2,000 visitors visit the “Island” and the Dam Trail every month, while a thousand more visit only the Dam Trail.

There is no limit to the number of buses permitted to access the “Island," however when there are more then three buses at a time, the company will set a time gap of 10 minutes between each entering bus. At any given time, there is a ten-car limit for each entry. The minimum number of visitors at a time is five.

The entrance fee is 25 NIS per person or 120 NIS per car for an organized tour to the Island. The tour usually includes an overview of the Israeli and Jordanian sides with a tour-guide. The entrance for the Dam Trail is near the Visitor Station at the foot of the hill. There is a combined ticket for Naharyim and Old Gesher which costs 40 NIS per child, 53 NIS per adult and 45 NIS for retirees.
Zoning

Zoning plan 1591 (Figure 17), approved on March 13, 1972, defines four different zoning uses:

1. Educational Zone
2. Undeveloped Agricultural Zone
3. Antiquity Zone
4. Developed Agricultural Zone

According to the plan the uses for each of these zones will be defined in a detailed plan that will be created for each area and will be approved by the planning committee.

Figure 17. Zoning Plan 1591 – Land usage
3.3.2 Adjacent Jordanian Areas

Due to the fact that the proposed project site is a military zone with restricted access, agricultural and other human activities are limited in the area. Thus, the area appears almost undisturbed.

However, limited agricultural activities are allowed in the dry lake bed area and its environs including bananas, vegetables and olive trees.

The area contains infrastructure facilities such as water access and an electric grid, provided for the army. Existing infrastructure could be used as a basis for the infrastructure needed for the Visitors’ Center and Eco-lodges, however, the adequacy of current infrastructure should be assessed in a more comprehensive evaluation.

The nearest town to the project site is North Shuneh. The predominant employment sector in the area is agricultural; smaller governmental and private sectors exist. Tourist infrastructure is very limited. The unemployment rate is as high as 40%.

**Tabkat Fahal** is a medium sized cluster of towns and villages, totaling approximately 25,000 residents. The area is home to the important archeological site of Pella, one of the great Roman Decapolis cities. Additionally, the northern Jordanian/Israeli border crossing is located in this area. Tabkat Fahal's main water resources for agriculture are the King Abdullah Canal, the Ziglab Dam, and the Wadi Al Arab Dam. The main source of drinking water is the Wadi Al Arab well, and water is pumped directly to a reservoir in Northern Shuneh.

**Muaz Bin Jabal** is a medium sized cluster of towns and villages incorporating several communities totaling 25,000 residents. Located in the heart of the Jordan River Valley, Muaz Bin Jabal is 215-150 meters below sea level.

The main problems of the areas are:

- Inadequate local tourist infrastructure
- Limited economic activities and limited opportunities for employment
- Lack of infrastructure (roads, telecommunications, waste collection, sewage, water network, etc.)
- Unregulated disposal of solid waste and water pollution from untreated effluent from villages;
- Inadequate zoning by local municipalities where oil change facilities/garages and workshops are located on the main street
- Low total gross income per capita.
3.3.3 Rotenberg Hydroelectric Power Plant

One of the prominent historic events in the area is the previous positive experience of peaceful cooperation. During the founding years of the Emirate of Trans Jordan, the Resident representative of the British Government requested and obtained permission from King Abdullah I (then Amir Abdullah), to build a hydroelectric power plant which supplied electricity for Palestine and Jordan. This unique agreement was reached in 1927 and enabled Pinchas Rotenberg, founder of the Palestine Electric Company (PEC), to build the company’s main power station at nearby Naharyim. The agreement gave the PEC (which later became the Israel Electric Corporation, Ltd.), rights to use 6,000 dunams of land under Trans-Jordanian control. On 6 June 1933, the Naharyim power plant was opened in a festive ceremony. The power plant functioned continuously until it ceased operations as a result of the Israeli Arab hostilities in 1948.

The site is located the confluence of the Yarmouk and Jordan Rivers, a location selected due to its potential to supply the greatest amount of hydroelectric power in the area. Moreover, the flow of the Jordan could be regulated by partially blocking and storing its waters in Lake Tiberias during the rainy winter season when water is more abundant, and then releasing these reserves in the summer. Topography and geography combined to suggest a name for the site: Naharyim ("Two Rivers").

The first facility of the complex was a dam which also served as a bridge over the Jordan, at the point where its waters spilled out of Lake Tiberias on their way south. The Degania Dam, as it is known, is adjacent to the bridge which forms part of the road leading from Tiberias to the Jordan Valley. The purpose of the dam was to regulate the flow of the Jordan River waters in accordance with the amount needed to activate the power plant. This was followed by the eight-meter-high Dalhamiya Dam (north of Kibbutz Ashdot-Ya'acov) by means of which a broad, deep channel was created for the Jordan, forming a flowing serpentine reservoir, three kilometers long, with a capacity of 60 cubic meters of water per second.

The third element was a dam over the Yarmouk, 14 meters high, which blocked the flow of the river not far from its natural spill into the Jordan and created an artificial lake covering 1200 dunams. Eight hundred cubic meters of water a second could pass through each of the dam's two gates.
A 400-meter concrete canal conducted the water from this lake to another pool from which it hurtled down through iron pipes from a height of 27 meters directly into the turbines of the power plant. The churning water activated the turbines and, its work completed, was channeled back through a special canal, 1,200 meters in length into the Jordan's natural riverbed.

The station, which during its existence was the only hydro-electric plant in Palestine, had an effective capacity of 25,500 hp. In 1945 Naharyim contributed 25 percent to Palestine's total electricity production.
Figure 20. Power Plant: Historical Photo and Present Day Condition

Figure 21. Site Plan Compiled Using the Archive Drawings
3.3.4 Train Station

Naharyim railroad station was built in the Bauhaus style, also known as the International Style, marked by the absence of ornamentation and by harmony between the function of an object or a building and its design. The Bauhaus style had a major impact on art and architecture trends in Western Europe, the United States, Canada and Israel (particularly in Tel Aviv). Tel Aviv, in fact, has been named to UNESCO's World Heritage List due to its abundance of Bauhaus architecture; it had some 4,000 Bauhaus buildings.

This Naharyim Bauhaus train station was once the lowest train station of the world - 246m below sea level. It was located on the Emek Train Line in British Mandate Palestine and serviced the workers of the Rothenberg Hydroelectric Power Plant from 1920 to 1932.

![Figure 22. Train Station](image)

3.3.5 Commemoration of Hattin Battle

The site is believed to be located on the route used by the Ayyubid Dynasty forces to stop the Crusaders from advancing in the historic Battle of Hattin in 1187. Arabic language inscriptions commemorating the historic event were erected by the Jordanian military stationed at the site.
3.4 Water Resources

This section describes the main water resources existing in Bakoura, their characteristics and suitability for use in the project. These resources are primarily the Yarmouk River, the Upper Jordan River, the Lower Jordan River and groundwater.

3.4.1 Yarmouk River

The Yarmouk River is the largest tributary to the Jordan River south of Lake Tiberias. Much of the water from the Yarmouk River is diverted before it reaches the Jordan River to supply the municipal water needs of towns and villages, agriculture, and industry.

This river is also the second largest river in the region in terms of annual discharge. The watershed lies principally in the Jordan Highland, with its eastern headwaters extending to an area that is about 1,800 m above sea level, where average annual rainfall is about 250 mm.

Climate characteristics in the Yarmouk watershed range from Mediterranean in the northwest to arid in the southeast and annual temperatures range from a few degrees below zero to about 46 °C. Average annual precipitation over the entire Yarmouk watershed is about 420 mm and potential evaporation is from 1,600 to 2,300 mm per year.
3.4.2 Lower Jordan River

This part of the Jordan River is of particular relevance to the proposed project in Bakoura as the Jordan River flows south through the Rift Valley from its outlet from Lake Tiberias and down to the Dead Sea. Tributaries to the Jordan River, south of the Yarmouk River, consist of deep wadis that cross the eastern and western escarpments from the Mountain Belt and Jordan Highland.

The characteristics of the Lower Jordan River are very different from those of the upper Jordan River. Only a small percentage of the inflow to Lake Tiberias is released to the Lower Jordan River and much of the discharge from the Yarmouk River is diverted for water supply before its confluence with the Jordan River.

In 1993, Israel set up a National River Administration to oversee the restoration of polluted rivers. The administration is charged with coordinating efforts to clean up the rivers, restore landscapes, rehabilitate ecosystems, flora and fauna, and develop rivers for such purposes as recreation, tourism, education and research. The idea is to entrust actual restoration work to local bodies while serving as a catalyst, coordinator and professional guide.

Yet, while the Upper Jordan is noted for the high quality of its water, the lower section of the River is affected both by seasonal changes in salinity, especially as a result of the diversion of saline springs away from Lake Tiberias in order to reduce saline infiltration from industrial and domestic effluents. Water quality in most sections is so poor that it renders the water unsuitable for agriculture.

The National River Administration has included a 30-kilometer section of the Lower Jordan River from Lake Tiberias to the Naharyim Bridge on its priority list for rehabilitation. Surveys were carried out, a river administration was established and a master plan is currently being prepared for the area.

As part of the Middle East Peace Process, a proposal was drafted to promote cooperation between Israel and Jordan through the rehabilitating the Jordan River, which serves as the common border between the two countries. As part of the project, both the quantity and quality of the River's waters will be improved. Treated or fresh water resources will be returned to the River to ensure a steady and clean flow from Lake Tiberias to the Dead Sea; convenient access to the river will be established and assured; plans to allow boats on parts of the river for possible reenactments of historic voyages along the river will be considered; and sites of cultural and religious value located along the River will be restored and opened to the public. The aim is to transform the Jordan River from an effluent channel to a flowing and vital river, a common border uniting neighboring states in cooperative projects for peace and sustainable development.

Limited current data is available about the flow of the Jordan and Yarmouk Rivers. What is clear even from the limited data is that both rivers have suffered dramatically from water diversion and pollution. The available data is presented in the Table below.
Table 3. Water Flow for Different Sources (mm³)

<table>
<thead>
<tr>
<th>Source</th>
<th>2005</th>
<th>2006</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yarmouk River</td>
<td>42.550</td>
<td>14.249</td>
<td>-28.301</td>
</tr>
<tr>
<td>Al Moukhayba Wells</td>
<td>32.121</td>
<td>34.665</td>
<td>2.543</td>
</tr>
<tr>
<td>Ziglab Valley</td>
<td>7.284</td>
<td>6.429</td>
<td>-.856</td>
</tr>
<tr>
<td>Al Kaffreen Valley</td>
<td>11.615</td>
<td>7.393</td>
<td>-4.222</td>
</tr>
<tr>
<td>The northern small valleys</td>
<td>4.811</td>
<td>2.527</td>
<td>-2.283</td>
</tr>
</tbody>
</table>

3.4.3 Groundwater Resources

The following figure shows the groundwater basins in the area of the project and the direction of groundwater movement (indicated by arrows). In the area of the proposed Jordan River Peace Park groundwater flows from east to west.

![Groundwater Basins and Direction of Groundwater Movement](image)

Source: Overview of Middle East Water Resources, Executive Action Team, Middle East Water Data Banks Project, 1998, Ministry of Water and Irrigation, Jordan

Figure 24: Groundwater Basins and Direction of Groundwater Movement

The Kinneret (Lake Tiberias) groundwater basin, near the location of the proposed Jordan River Peace Park, has the highest recharge rate (550 MCM/year) of all groundwater basins in the region. This implies that groundwater in the Bakoura area is more likely to contribute positively to the quantity of surface water flows than to detract from them (in
the form of infiltration). This means that the general features of the groundwater aquifer in Bakouura will likely support the proposed lake system.

Detailed groundwater and geotechnical studies in the Bakouura area should be undertaken to more accurately establish the natural rate of infiltration of surface water into the ground based on the underlying soil composition and characteristics. The geotechnical investigation should also reveal the presence of any faults or fissures through which water could seep underground. This will affect the feasibility of flooding the lake as well as determining the rate of replenishment needed.

However, for the purposes of the study and at this stage of project development it is assumed that no major water infiltration from the lake takes place.

The table below shows the discharge of groundwater basins in the vicinity of the project area.

Table 4. Springs Discharge in the Basins

<table>
<thead>
<tr>
<th>Basin Name</th>
<th>Discharge in mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordan River</td>
<td>19.3</td>
</tr>
<tr>
<td>Yarmouk River</td>
<td>11.67</td>
</tr>
<tr>
<td>Arab Valley</td>
<td>.183</td>
</tr>
<tr>
<td>Ziglab Valley</td>
<td>.015</td>
</tr>
</tbody>
</table>

The Yarmouk Basin is located in the North West area of Jordan and extends to Syria. The Basin suffers severely from water diversion, a trend further aggravated following the completion of the Unity Dam in 2006 which led to a 4.17 meter drop in measured water levels.

The level of groundwater is monitored through a system of monitoring wells, as presented in the Table 5.

Table 5. Water Level (m) measured at Monitoring Wells, 2006

<table>
<thead>
<tr>
<th>Basin</th>
<th>Well</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yarmouk</td>
<td>Sama sarhan</td>
<td>167</td>
<td>166.99</td>
<td>166.05</td>
<td>165.98</td>
<td>166.15</td>
<td>169.05</td>
<td>169.73</td>
<td>170.55</td>
<td>171.4</td>
<td>171.68</td>
<td>171.51</td>
<td>171.2</td>
</tr>
<tr>
<td></td>
<td>Tourky alfaress</td>
<td>156.6</td>
<td>156.25</td>
<td>156.04</td>
<td>156.02</td>
<td>156.13</td>
<td>157.02</td>
<td>157.58</td>
<td>158.25</td>
<td>139.1</td>
<td>160.11</td>
<td>160.42</td>
<td>160.3</td>
</tr>
<tr>
<td>Jordan Valley</td>
<td>Kofour assad</td>
<td>114</td>
<td>113.94</td>
<td>114.13</td>
<td>114.29</td>
<td>114.42</td>
<td>114.6</td>
<td>114.97</td>
<td>115.21</td>
<td>115.4</td>
<td>116.05</td>
<td>116.21</td>
<td>118.4</td>
</tr>
<tr>
<td>Wadis Al-yabess</td>
<td>57.41</td>
<td>57.41</td>
<td>57.56</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

3.4.4 Water Quality

No information is available on the water quality of the Yarmouk and Jordan Rivers. It is critical that an extensive study of the water quality be undertaken during the Jordan River Peace Park's comprehensive feasibility study.

However, information on water quality is available for the King Abdullah Canal and, as since it is supplied directly from the Yarmouk River, such data could be useful in a preliminary evaluation of the water quality.

Table 6. Water Quality at King Abdullah Canal

<table>
<thead>
<tr>
<th>Source</th>
<th>Ph unit</th>
<th>EC (us/cm)</th>
<th>NO3 (mg/l)</th>
<th>PO4 (mg/l)</th>
<th>TOC (mg/l)</th>
<th>NH4 (mg/l)</th>
<th>Odor(range) TON</th>
<th>CL-a (Avg mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degania⁶</td>
<td>8.42</td>
<td>1136</td>
<td>.42</td>
<td>.05</td>
<td>2.89</td>
<td>-</td>
<td>17-6</td>
<td>5.38</td>
</tr>
<tr>
<td>Deir Allah</td>
<td>8.37</td>
<td>1062</td>
<td>5.18</td>
<td>.24</td>
<td>2.54</td>
<td>-</td>
<td>17-6</td>
<td>10.88</td>
</tr>
<tr>
<td>Water Standard⁷</td>
<td>6-9</td>
<td>1000</td>
<td>50</td>
<td>15</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0.5-1.0</td>
</tr>
</tbody>
</table>

In general, the water quality and concentrations of different chemical substances are within normal range. However, the chlorine concentration exceeds the standard level.

3.5 Provisions in the Peace Treaty on Water Allocation

The following table presents the provisions of the Israel-Jordan Peace Treaty (relevant excerpts were selected and paraphrased) regarding allocations from both the Yarmouk and Jordan Rivers on a seasonal basis.

Table 7. Provisions on Water Allocation in the Jordan-Israeli Peace Treaty

<table>
<thead>
<tr>
<th>Season (May to October)</th>
<th>Provisions on Water from the Yarmouk River</th>
<th>Provisions on Water from the Jordan River</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Israel extracts 12 MCM and Jordan receives the rest of the flow.</td>
<td>Israel transfers 20 MCM from the Jordan River to Jordan.</td>
</tr>
</tbody>
</table>

⁶ Station is located 3 km downstream of Degania Dam
⁷ JS893/1995 Water Reuse Standard
### Winter (October to May)

<table>
<thead>
<tr>
<th>Israel extracts 13 MCM and Jordan is entitled to the rest of the flow subject to the following provisions: Jordan concedes to Israel pumping an additional 20 MCM from the Yarmouk in winter in return for Israel conceding to transferring to Jordan during the summer period the quantity specified below from the Jordan River.</th>
<th>Jordan is entitled to store, for its use, a minimum average of 20 MCM of water from the flooding of the Jordan River, south of its confluence with the Yarmouk. Excess water from flooding that is not usable and that will otherwise be wasted can be utilized for the benefit of both parties.</th>
</tr>
</thead>
</table>

### Additional Provisions

| In order for the waste of water to be minimized, Israel and Jordan may use, downstream of point 121/Adassiya Diversion, excess flood water that is unusable for other purposes. | • Israel is entitled to maintain its current uses of the Jordan River waters between its confluence with the Yarmouk and its confluence with Tirat Zvi/Wadi Yabis. Jordan is entitled to an annual quantity equivalent to that of Israel, provided however, that Jordan's use will not harm the quantity or quality of the Israeli portion.  

• Jordan is entitled to an annual quantity of 10 MCM of desalinated water from the desalination of about 20 MCM of saline springs now diverted from the Jordan River. Israel will explore the possibility of financing the operation and maintenance costs of supplying Jordan with this desalinated water (not including capital cost). |

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#### 3.5.1 Special Provisions in the Peace Treaty on Bakoura Area

The Israel–Jordan Peace Treaty contains special provisions that are applicable to the Naharyim/Bakoura area. The special status created in the agreements provides a strong foundation for cooperative projects, such as the establishment of the Jordan River Peace Park in the area of Naharyim/Bakoura.

Article 3, Clause 8 states that "Taking into account the special circumstances of the Naharyim/Bakoura area, which is under Jordanian sovereignty, with Israeli private ownership rights, the Parties agreed to apply the provisions set out in Annex I (b)". Annex I (B) is attached to this report.

#### 3.5.2 Water Supply and Water Quality Issues

##### 3.5.2.1 Water Supply Options

The following table presents suggestions for meeting the demand for water, both for the initial filling of the lake and for maintaining the water balance thereafter. Naturally, these options are based on the provisions of the Jordan-Israel Peace Treaty and need to be
further developed, discussed and agreed upon in detail between the governments of Israel and Jordan at future stages of project development

**Table 8. Options for Meeting Water Needs for the Lake**

<table>
<thead>
<tr>
<th>Season</th>
<th>Relevant Peace Treaty Clauses</th>
<th>Initial Filling of the Lake System</th>
<th>Sustaining the Lake System</th>
<th>Issues / Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer (May to October)</strong></td>
<td>• Yarmouk River: Israel extracts 12 MCM and Jordan receives the rest of the flow.</td>
<td>• <strong>Option 1</strong>: If the lake is to be filled during summer, Yarmouk River may supply the amount of water needed – to be equally shared between Israel and Jordan.</td>
<td>• <strong>Option 1</strong>: Yarmouk River may supply the replenishing water needed – to be equally shared between Israel and Jordan.</td>
<td>• In dry years, the Yarmouk River's flow may be too low to provide the amount needed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Option 2</strong>: Israel provides the full amount needed from its share in the Jordan River and Jordan pays for the transfer from Degania dam to the Lake.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Jordan River: Israel transfers 20 MCM from the Jordan River to Jordan.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Winter (October to May)</strong></td>
<td>• Yarmouk River: Israel extracts 13 MCM and Jordan is entitled to the rest of the flow (subject to certain conditions).</td>
<td>• <strong>Option 1</strong>: If the lake is to be filled during winter, Yarmouk River may supply the amount of water needed – to be equally shared between Israel and Jordan.</td>
<td>• <strong>Option 1</strong>: Yarmouk River may supply the replenishing water needed – to be equally shared between Israel and Jordan.</td>
<td>• If Jordan River is the source of initial filling or replenishment water quality issues may arise regarding quantity and quality, especially in the summer months.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>Option 2</strong>: Jordan provides the full amount needed from its share of Jordan River and Israel pays for the transfer from Degania dam to the Lake.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Jordan River: Jordan is entitled to store, for its use, a minimum average of 20 MCM of the flood water in the Jordan River, south of its confluence with Yarmouk. Excess floods that are not usable and that will otherwise be wasted can be utilized for the benefit of the two Parties.</td>
<td>• <strong>Option 2</strong>: Both Jordan and Israel provide the full amount needed from their shares of the Jordan River and both share the cost of transfer from Degania dam to the Lake.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Furthermore, other non-conventional sources of water could be used to support a continuous supply of water for the lake. One promising example could be the use of treated wastewater from the North Shuneh and the surrounding communities. North Shuneh is currently planning to build a wastewater treatment plant that will produce a treated effluent of good quality, suitable for use in agricultural irrigation. This option should be further investigated in later stages of project development.

3.6 Legislative Framework

The following legislation was identified as relevant to the present study:

3.6.1 Jordanian Legislation

Treaties, agreement and conventions relevant to Jordan are as following:

- Treaty of Peace between the State of Israel and the Hashemite Kingdom of Jordan, October 26, 1994
- Convention on the Protection of World Cultural Heritage and Natural Heritage, Paris, 1972
- Convention on Biological Diversity, Rio De Janeiro, 1992
- Convention on the Conservation of Migratory Species of Wild Animals, Bonn, 1977
- RAMSAR Convention
- United Nation Convention on Combating Desertification, 1996
Relevant Jordanian legislation is presented in table below:

### Table 9: Relevant Jordanian Legislation

<table>
<thead>
<tr>
<th>Regulation/ Classification of Legislations</th>
<th>Issued</th>
<th>Remarks</th>
<th>Implementing Agency/ Dept.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Law No. 52</td>
<td>2006</td>
<td></td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>Agriculture Law No. 44</td>
<td>2002</td>
<td></td>
<td>Ministry of Agriculture</td>
</tr>
<tr>
<td>Management and Administration of Government Properties Law No. 17</td>
<td>1974</td>
<td></td>
<td>Finance Ministry</td>
</tr>
<tr>
<td>Jordan Valley Authority Law No. 19</td>
<td>1988</td>
<td></td>
<td>Jordan Valley Authority</td>
</tr>
<tr>
<td>Law of Organization of Cities, Villages and Buildings No. 79</td>
<td>1966</td>
<td></td>
<td>Prime Minister</td>
</tr>
<tr>
<td>Protection of Birds and Wild Life By-law No. 113</td>
<td>1973</td>
<td></td>
<td>Royal Society for the Conservation of Nature (RSCN)</td>
</tr>
<tr>
<td>Natural reserves and National Parks bylaw</td>
<td>2005</td>
<td>The Ministry of Environment contracted RSCN to establish and manage the reserves</td>
<td>Ministry of Environment</td>
</tr>
<tr>
<td>Land use planning law</td>
<td>2007</td>
<td></td>
<td>Ministry of Municipalities</td>
</tr>
<tr>
<td>Law of Antiquities No. 21</td>
<td>1988</td>
<td></td>
<td>Archaeological Department</td>
</tr>
<tr>
<td>The Law of Public Health No. (54)</td>
<td>2002</td>
<td></td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>Investment Promotion Law No. 16</td>
<td>1995</td>
<td></td>
<td>Higher Council for Encouragement of Investment</td>
</tr>
</tbody>
</table>
**Israeli Legislation**

Conventions, agreements and treaties relevant to Israel are as following:

- Treaty of Peace between the State of Israel and the Hashemite Kingdom of Jordan, October 26, 1994
- United Nations Framework Convention on Climate Change, 1996
- RAMSAR Convention, signed 1993, ratified 1997
- Convention Concerning the Protection of World Cultural and Natural Heritage, 2000
- International Convention for the Protection of New Varieties of Plants, 1979
- United Nations Convention to Combat Desertification, 1996

The Israeli environmental legislation encompasses laws for the protection of nature and natural resources (air, water and soil), for the prevention of environmental nuisances (prevention of air, noise, water and marine pollution) and for the safe treatment of contaminants and pollutants (hazardous substances, radiation and solid and liquid waste).

Alongside laws and regulations dealing with specific environmental issues, Israel's legislation includes comprehensive laws, such as the Planning and Building Law and the Licensing of Businesses Law, which provide a framework for controlling the use of resources and promoting sustainable development.

Relevant Israeli legislation is presented in Table below:

**Table 10: Relevant Israeli Legislation**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Relevant Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Planning</td>
<td>Planning and Building Law, 1965</td>
</tr>
<tr>
<td></td>
<td>Planning and Building Regulations (Environmental Impact Statement), 1982</td>
</tr>
<tr>
<td></td>
<td>Planning and Building Regulations (Environmental Impact Statement), 2003</td>
</tr>
<tr>
<td>Abatement of Nuisances</td>
<td>Public Health Ordinance, 1940</td>
</tr>
<tr>
<td></td>
<td>Abatement of Nuisances Law, 1961</td>
</tr>
<tr>
<td></td>
<td>Abatement of Environmental Nuisances (Civil Action) Law, 1992</td>
</tr>
</tbody>
</table>

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8 Ministry for Environmental Protection, Israel
3.7 Technical Feasibility and Conceptual Design

The project concept and master plan for the proposed Jordan River Peace Park are described above in section 2. The section below describes the technical issues related to the different aspects of the project.

Lake Boundaries, Lake Depth and Phased Filling

The lake proposed to be flooded under this study would be all or part of the original Naharyim Lake which had been used to provide water for the hydrological power plant. The total area of the lake shown in Figure 10 below is approximately 380,000 m². Therefore, the area of the proposed lake could range up to the full area of the original lake (380,000 m²). An optimum lake size may not necessarily be a constant area but could vary on a seasonal (or other) basis. The proposed lake area can be seen in Figure 2.

Based on an assumed lake area of 380,000 m², a fairly flat topography and an average depth of 0.5 m, the amount of water needed to fill the lake initially will be approximately 0.2 million m³. It is noteworthy that at this stage of study, the estimates are based on field observations and best professional judgment, not actual measurements or mapping.
Hence, the lake bed is considered to be relatively flat with no significant variation in surface elevation.

The proposed concept for the lake is based on having a minimum depth of 30 - 50cm which would be sufficient to sustain the basic wildlife envisaged for the lake. It is also possible that certain areas within the lake will reach greater depths (1-1.5m) to provide specific requirements for aquatic life such as providing favorable conditions for fish reproduction.

The Hula Lake project in Israel seems to be a reasonable model to adopt for re-creating the proposed lake in Bakoura from a water resource management point of view. Water can be withdrawn from the proposed lake to supply nearby farms with irrigated agriculture thus maintaining constant flushing of the lake system and preventing stagnation. If the lake holds approximately 0.2 million m$^3$ and the daily water take for irrigation is about 6,500 m$^3$, this means that the lake will be completely flushed every 30 days. For lakes of this size this is considered fairly sufficient to prevent water stagnation and its detrimental consequences for its water quality.

Since the water that will fill the lake will most likely come from surface water, it can be argued - for the sake of resource utilization - that the lake will not cause additional evaporation losses.

The initial filling of the lake could be completed once or in stages. It is preferable to do this in stages for the following reasons:

- To alleviate any pressure on available water resources.
- To increase the lake's surface area gradually in order to minimize the amount of water necessitated in the Park's initial development phases.
- To monitor and identify the potential for any parts of the lake to become stagnant, or where other water quality problems are likely to arise. In this event the mixing/circulation regime can be accordingly altered to address this issue.

Evaporation rates (pan values) in the Bakoura area show figures in the range of 1500-1700 mm per year$^9$. Although wind speed and stability of thermal stratification over the water surface could significantly affect the evaporation rates from the lake, a constant evaporation rate has been adopted for the purpose of this study. This implies that the lake would require an annual water supply of approximately 1.6 m$^3$ for each 1 m$^2$ of surface area in order to maintain the water balance by compensating for the natural evaporation losses. Naturally, evaporation rates vary on an annual basis depending on the season and could differ by up to 15% between summer and winter seasons$^{10}$. Consequently, the rate of replenishment is expected to vary throughout the year with higher rates required in the

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$^9$ Figures based on University of Jordan research findings in nearby areas and confirmed by telephone communication with Professor Hani Khoury, Head of Department of Geology and Mineralogy, University of Jordan.

summer months. However, for the purpose of this report, a constant evaporation rate is used for the yearly estimates of water needed to sustain the lake level.

The following tables present estimates of the water quantities needed for a phased filling of the lake. Two scenarios are proposed for the sizing and filling of the lake:

- **Scenario 1**: Using a fixed area for the lake at 380,000 m$^2$, starting with a lake depth of 30cm and then increasing it over a 5-year period to a depth of 1m.
- **Scenario 2**: Starting with a lake surface area of 240,000 m$^2$ then gradually increasing it to 380,000 m$^2$ while also increasing the water depth in the lake from 30cm to 1m over a period of 5 years.

**Table 11. Scenario 1 – Estimates of Water Needs for Phased Filling of a Constant Area Lake**

<table>
<thead>
<tr>
<th>Year</th>
<th>Depth (m)</th>
<th>Lake Surface Area (m$^2$)</th>
<th>Water supply to fill lake (m$^3$)</th>
<th>Annual water supply to sustain the lake (m$^3$)</th>
<th>Total annual water supply needed (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3</td>
<td>380,000</td>
<td>114,000</td>
<td>608,000</td>
<td>722,000</td>
</tr>
<tr>
<td>2</td>
<td>0.4</td>
<td>380,000</td>
<td>38,000</td>
<td>608,000</td>
<td>646,000</td>
</tr>
<tr>
<td>3</td>
<td>0.65</td>
<td>380,000</td>
<td>95,000</td>
<td>608,000</td>
<td>703,000</td>
</tr>
<tr>
<td>4</td>
<td>0.8</td>
<td>380,000</td>
<td>57,000</td>
<td>608,000</td>
<td>665,000</td>
</tr>
<tr>
<td>5</td>
<td>1.0</td>
<td>380,000</td>
<td>76,000</td>
<td>608,000</td>
<td>684,000</td>
</tr>
<tr>
<td>6 and beyond</td>
<td>1.0</td>
<td>380,000</td>
<td>0</td>
<td>608,000</td>
<td>608,000</td>
</tr>
</tbody>
</table>

**Table 12. Scenario 2 – Estimates of Water Needs For Phased Filling of a Variable Area Lake**

<table>
<thead>
<tr>
<th>Year</th>
<th>Depth (m)</th>
<th>Lake Surface Area (m$^2$)</th>
<th>Water supply to fill lake (m$^3$)</th>
<th>Annual water supply to sustain the lake (m$^3$)</th>
<th>Total annual water supply needed (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3</td>
<td>240,000</td>
<td>72,000</td>
<td>384,000</td>
<td>456,000</td>
</tr>
<tr>
<td>2</td>
<td>0.3</td>
<td>280,000</td>
<td>12,000</td>
<td>448,000</td>
<td>460,000</td>
</tr>
<tr>
<td>3</td>
<td>0.5</td>
<td>280,000</td>
<td>56,000</td>
<td>448,000</td>
<td>504,000</td>
</tr>
<tr>
<td>4</td>
<td>0.75</td>
<td>320,000</td>
<td>100,000</td>
<td>512,000</td>
<td>612,000</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>380,000</td>
<td>140,000</td>
<td>608,000</td>
<td>748,000</td>
</tr>
<tr>
<td>6 and beyond</td>
<td>1</td>
<td>380,000</td>
<td>0</td>
<td>608,000</td>
<td>608,000</td>
</tr>
</tbody>
</table>

The above figures are estimates at this stage and may vary by 5-15% depending on the grade of the lake banks (a function of the type of edge treatment adopted). Also, the estimates do not account for the reduced lake area due to the construction of islands or land formations inside the lake.
It can be seen from the above tables that the second scenario allows for less water requirements during the first 4 years of operation, while both scenarios would require the same amount of water beyond the 5th year. However, it should be mentioned that the total annual water requirement is not significant in the sense that it is not expected to strain the available water supplies from either Jordan or Yarmouk.

Further stages of project development need to examine more closely the minimum (30 cm) and maximum (1.0 m) depths suggested for the lake to ensure that they are well within the range that meets the requirements for water fowl and aquatic life that are expected to be sustained by the lake system. When considering the minimum water depth in the lake, it is critical to sustain this level during summer months when evaporation rates are at their highest.

Installations (pipes, channels, pumps, etc.) that will be needed to provide a constant inflow of water for the lake as well as for discharging water from the lake for agricultural or other uses, will be determined in light of the source of water and the uses of discharged water. In this context, it may be more feasible to use existing facilities/channels and also to rely on gravity - to the extent possible - to reduce operational costs.

3.7.1 Flood Occurrence

Since there is a possibility for floods to occur in the project area, as can be seen from the historical records of both the Yarmouk and Jordan River systems, the design should consider some form of separation between the flood plain or river bed and the lake area where all ecological/tourist activities are planned to take place. The infrastructure to be provided should be designed with features that will enable it to withstand large floods.

3.7.2 Water Quality Considerations

The proposed lake is located in a hot climate and is expected to be replenished with water of currently uncertain quality. Such a system could be vulnerable to water quality deterioration including lower oxygen solubility, high primary productivity and the possible stagnation of bottom waters and sediments. Water quality deterioration will likely have both ecological and water treatment consequences.

In the absence of details of the replenishing water properties, its mode of introduction and the nature and extent of any mixing processes, the current description of the system is inadequate to make definitive judgment on water quality issues. That is not to say that there are serious flaws in the proposed flooding of the lake system but rather that there is the potential for significant water quality issues to arise and that these need to be thought through based on a more complete description of how the system will operate and what the quality of inflowing water will be.

The dry bed of the lake area has been cultivated as agricultural land for decades, mostly for seasonal crops. This makes it important to conduct soil analysis at later stages based
on field sampling to determine the presence of any potential contaminants that have been accumulating in the soil over the years due to agricultural activities including pesticides and fertilizers. If contaminants are found in unacceptable concentrations they must be removed prior to the flooding the lake. Failure to do so may result in negative long-term impacts on aquatic life, the lake's water quality, and ultimately the value of the intended use of the lake as a recreational and tourist attraction. Options for decontamination of affected soils will be determined in light of the type of contaminants found and their concentration. Treatment options may range from on-site decontamination (for example for volatile organic compounds) to more sophisticated treatment off-site or removal and safe disposal of affected soils. Naturally, de-contamination will have cost implications.

Options will need to be investigated regarding the water quality that will be used in the initial filling of the lake. For example, it is possible to consider initially filling the closed system with a high quality water after which time lake water will be continually replenished with treated water. However, this could pose a challenge given that the source of replenishing water is of uncertain quality at this stage.

Stratification or lack of proper mixing can generate water quality problems. The likelihood for stratification rises with an increasing lake depth. Critical dissolved oxygen levels need to be determined based on the requirements of aquatic life that is planned for the lake system. An aspect that will need to be examined during future stages of项目 development is the potential for developing "dead areas" in the lake. In these areas water needs to be circulated to avoid stagnation. In the case of stagnation, air pumps could be used to stimulate mixing thereby reducing stratification and enhancing deep water oxygen levels. These could possibly be presented as an attractive "water feature" in the lake.

In order to reduce the amount of replenishing water needed for the lake, it is suggested to use two water levels for the lake: one for winter and another for summer. Increasing the water level in winter by about 0.25 m from the summer water level could accommodate up to 16% of the annual evaporation losses (which will be highest in summer) thus reducing the replenishment water needed during summer months. However, this should be further investigated to assess possible impacts on aquatic life and water fowl.

During the operation of the project, irrigation is expected to continue to take place for crops and trees in the predominantly agricultural area around the lake. Nutrients and pesticides may be washed into the lake by rains, especially during the rainy season and by natural drainage. Thus proper management of irrigation water will be essential to maintain good quality water in the lake. Thus maintaining the lake should follow an integrated approach, involving the management of tourist and recreational activities around the lake and agricultural irrigation in Bakoura.

It will be important to perform water quality testing to assess the current water quality of the Yarmouk and Jordan Rivers. Another set of information that is useful would be the groundwater properties; notably its salinity and chemical composition. By raising the surface water levels through the impound lake, the groundwater in the area is expected to
be elevated. If the groundwater is of a lower salinity than the water in the lake and the net flow is inwards then this water will percolate into the lake. There is also the possibility that enhanced nutrient concentrations in the groundwater (if any) might contribute to the total nutrient load within the lake.

There will be a need to determine the flushing volumes that need to be pumped to maintain the water balance, including achieving the desirable water quality in the lake. A hydrodynamic/water quality model for the lake may be considered at the design stage for this purpose. This will be preceded by a detailed topographic mapping to establish bathymetry and determine the expected water depths throughout the lake system. Furthermore, the presence and operation of any dikes, weirs or even-locks that will be part of the project need to be considered in any modeling.

### 3.7.3 Conclusions and Recommendations

- There is a need to further examine certain features of the dry lake bed in the next study stages. This includes mapping the topography of its surface, exact boundaries and the potential for any fissures or faults underneath.
- Key cost issues for filling and sustaining the lake include whether needed water will be obtained free of charge or not, means of transporting water to the site, and operational costs. These cost elements need to be addressed in a full feasibility study.
- Consider conducting the initial filling of the lake during winter when water resources are more available and less strained.
- Use Yarmouk River waters for initial filling of the lake and for providing replenishment, to the extent possible. The poorer water quality of the Jordan River could pose some water quality challenges.
- Perform water quality tests to assess the current water quality situation in both the Yarmouk and Jordan Rivers including seasonal variations.
- Proper management of the lake's watershed will be critical to control the inflow of nutrients and chemicals generated by agricultural activities into the lake.
- There is a need to evaluate the presence and concentration of any soil contaminants that may be found in the lake's dry bed and assess any remedial action required prior to flooding the lake bed.
- Due to probability of flood occurrence in the project area, planning and design should account for a safe separation between the flood plain or river bed and areas where tourist activities will take place.
- Capitalize on and enhance the unique advantages that the lake can provide to the water resources in the project area, such as using it as a storage reservoir for flood water in winter which can be later used for other needs by both countries. The lake can contribute to recharging the groundwater aquifer in Bakoura area and provide irrigation water to nearby agricultural fields.
- Consider the need to perform a hydrodynamic/water quality modeling for the lake at the design stage to determine the flushing volumes that need to be pumped to maintain the water balance while achieving the desirable water quality in the lake.
3.8 Environmental Zoning

The zoning system is an integrated approach to the classification of land and water areas in a national park. Areas are classified according to the need to protect the ecosystem and the park's cultural resources. The capability of these areas in providing opportunities for visitors should also be considered when making decisions about zoning.

Based on the identified zones of activity presented in figure 3 on page 12, and taking into consideration the environmental factors, the following zoning is proposed as presented in the Table below:

<table>
<thead>
<tr>
<th>#</th>
<th>Zone</th>
<th>Description</th>
<th>Corresponding Activity Zone</th>
<th>Proposed Mitigation Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zone 1 – Special Preservation</td>
<td>Areas need special preservation due to the presence of unique, threatened or endangered natural or cultural features, or include the best examples of such an ecological or cultural feature in the area. Preservation is the key consideration. Motorized access and circulation not to be permitted.</td>
<td>Yarmouk Lake and wetland, Jordan River &amp; Riparian Habitat</td>
<td>Any development activities should be scheduled for the summer period to avoid disturbance of migrating birds during peak periods. Re-vegetation, if necessary, only to be done using native plants. Use of environmentally friendly materials for construction of bird watching huts. Observation huts and trails designed to limit intrusion on the natural environment.</td>
</tr>
<tr>
<td>2</td>
<td>Zone 2 – Protected Habitat</td>
<td>Contains a number of physiographic and biotic features that are unique to the park and require further study to determine their status.</td>
<td>Protected Habitat Zone</td>
<td>Motorized vehicles access is prohibited. Visitors allowed access only on designated trails.</td>
</tr>
</tbody>
</table>
### 3.9 Architectural Conceptual Design

This section of the report addresses the technical feasibility of converting/adapting the existing buildings, site amenities, and landscape features into an ecological peace park to accommodate the proposed eco-tourism activities.

#### 3.9.1 Focus of Study

The study focuses on the following architectural and landscape components existing on the site:

- 1920’s workers’ homes to be converted into eco-lodges (Phase I);
- 1920’s Railway Station to be converted into a bicycle rental shop (Phase I);
- Armed forces offices to be re-used as panoramic look out (Phase I);
- 1920’s Hydroelectric Power Station to be converted into a visitor’s center (Phase II);
- Renovation of the Mamluk Khan at the Old Gesher Site;
- Construction of main entrance to Naharyim;
- 1920’s Pressure Tank to be converted into a panoramic terrace (Phase II);
• 1920’s Transformer Station to be converted into recycled industrial art workshop (Phase II)
• Roads and paths to be adapted into hiking trials and service roads (Phases I & II);
• Ottoman and British Mandate bridges at 'Jisr al-Majami'/ Gesher to be renovated for use (Phase III).

The study also considered the possibility of adding new buildings and light structures to the site including:

• A new gateway building and visitor orientation point at the southern entrance (Phase I);
• A kitchen/dining hall facilities, a reception and information center, and parking for golf carts and bicycles to be developed in the lodging area (Phase I);
• Outdoor pergolas, communal tents, and seating areas to be developed in the logging area (Phase I);
• Walking and biking trails of various levels of difficulty (Phases I & II);
• Scenic viewing points and shade structures (Phase I);
• Crop plantations for migratory birds (Phase I);
• Bird hides (Phases I & II);
• Re-vegetation of environmentally degraded areas (Phases I, II, & III);
• Interpretation and informational signage (Phases I & II);
• Panorama highlighting the historic importance of the area (Phase III);
• Interlinking light-vehicular, biking, and walking trails between Bakoura/Peace Island, Naharyim, and 'Jisr al-Majami'/ Gesher (Phase III);
• Four entry points are proposed for the Peace Park, renovation and/or enhancement of the entrances at 'Jisr al-Majami'/ Gesher and Naharyim, establishment of the entry points at Jordanian side as shown on the following map.
Figure 25. Proposed Entrances to the Peace Park

Refer to Figure 26 below for location of the existing and proposed site facilities.
Figure 26: Location of Existing and Proposed Site Facilities

Figure 26/ Aerial View Legend: 1) Site of Proposed Jordanian Panorama, 2) Power Station and Pressure Tank, 3) Railway Station, 4) Armed Forces Offices, 5) Transformer Station, 6) Former Workers’ Housing.
3.9.2 Methodology

The following methodology was applied during the study:

Data Collection

A review of literature published on the early modern period during the British Mandate was conducted. The following articles were used as reference material in this report:


Design drawings for the power station complex were also obtained from the archives of the Israeli Electric Company. These drawings are important reference materials for reconstruction and adaptive re-use activities in Phase II of the project.

Mapping and Analysis

The following mapping and site analysis activities were also conducted:

- Photographic survey of site features and significant buildings.
- Site analysis of the main features of the site (circulation/plumbing systems, important scenery/lookouts, slopes, building locations etc.).
- Assessment of built structures in terms of adaptability to the proposed functions.
- Analysis of site opportunities and constraints.

Conceptual Design Ideas and Preliminary Cost Estimate

The architectural team conducted several brainstorming sessions with the rest of the team to determine the best approach to develop the site. Conceptual design ideas were then proposed. The design ideas focused on simple, site-appropriate solutions that were then used as a basis for the preliminary cost estimate for site works, adaptive re-use of buildings, and rehabilitation of the site landscape.

3.9.3 Proposed Design and Intervention Strategy

The landscape strategy assumes an intentional limit in intervention throughout the site's development. The natural topography would be preserved and vegetation would be restored in environmentally degraded areas using native, biogeographically appropriate plant species. The purpose of re-vegetation would be habitat creation and the introduction of exotic species would only take place to promote habitat creation for migratory birds. Phasing out environmentally harmful and/or invasive plant species would also take place.
Existing roads would be preserved and/or consolidated where necessary. Additional roads would only be added if deemed critical to visitor circulation or park maintenance. Hiking and biking trails would be laid with a simple compacted aggregate finish that would only require clearing of vegetation and minor maintenance.

Landscape lighting would only be used in the Eco-lodge zones to light pathways and outdoor pergolas. Options for the use of solar lighting supplemented with candle light and gas lanterns would be preferred.

The approach to the preservation and adaptive re-use of the site structures assumes the following:

- The character of the buildings would be preserved.
- Additions/alterations would be minimal and respect the integrity of the buildings.
- Only structurally unsound and public safety hazards would be removed.
- Simple low-cost infrastructure (water and electricity) would be prioritized.
- To minimize invasive infrastructure, renewable energy sources, water saving and natural ventilation systems would be prioritized.

### 3.9.4 Site Constraints (Challenges)

#### 3.9.4.1 Conflict of Interpretation

While the proposed area of the Jordan River Peace park is home to numerous important sites of cultural heritage, the conflict of interpretation currently present at many of the area's heritage sites could act as a constraint to the project's realization. Like many heritage sites located throughout the region, and more so in its border areas, the modern historical narratives associated with some of the Park's heritage sites elicit elements of the Israel-Arab conflict.

There is a need for increased awareness of the area's shared heritage and sensitivity to the complicated, personal and at times painful history of the site. Attention to site interpretation is thus a priority with specific reference to the Jordanian visitor's narrative at the Israeli sites of Gesher/’Jisr al-Majami’ and Naharyim, particularly with regards to the Israeli sites' historical narratives during the pre-state period and the 1948 and 1967 war periods; likewise greater understanding and sensitivity regarding the Israeli visitor's narrative at Jordanian sites such as the Power Station at Bakoura is necessary, again with particularly with regards to the twentieth century regional wars.

Situated at a strategic geographical location, the area of the Peace Park has long served as a zone of interaction, as most famously illustrated by the three bridges at the historic crossing point over the Jordan at Gesher/’Jisr al-Majami’ as well as the area's close proximity to one of the region's most significant historic overland routes, the Via Maris. As such promoting understanding of the area's shared heritage is not only necessary regarding the modern period but should be developed to addressed many different
historic periods such as the Frontiers of the Roman Empire, the Crusader/Islamic period and others.

3.9.4.2 Challenging and Costly Renovation Work (Power Station Complex)

The renovation work required to adapt the power station building and pressure tank will be very costly due to

- the site’s distance from the main construction zones in Jordan will incur additional costs;
- heavy equipment such as cranes, loading, and grading equipment is needed for repairing damaged structural parts of the pressure tank and the roofing of the power station;
- reconstruction of roof beams and other period specific elements would require special casts and construction techniques not commonly practiced in Jordan;
- custom window frames, terrazzo tiles, and metal work would be needed to renovate the building.

These elements would also be particularly costly to manufacture and install.

3.9.4.3 Landscape Rehabilitation

The rehabilitation of the landscape and re-vegetation of environmentally degraded areas using native, biogeographically appropriate plant species would also be a challenge. Native plants are not widely grown in Jordan and are not commercially available in large quantities. A special nursery would need to be set up or local producers could be contracted to grow the necessary plants.

3.10 Proposed Site Facilities (New and Adapted Buildings)

Below is the site plan showing the proposed new and adapted buildings, the Yarmouk Lake, crop areas for migratory birds, trails and tracks, viewing point and bird hides, as well as the proposed phasing plan.
Figure 27: Proposed Site Facilities

Figure 28. Enlarged Legend for the Map Showing Proposed Facilities
3.11 Phase I Proposal

The proposal for Phase I includes the following: Gateway/Visitor Orientation Point, Eco-Lodging Facilities, Bicycle Shop, Panoramic Lookout, Yarmouk Lake and Bird Watching Amenities, Tracks, Trails, and Signage, and Landscape Rehabilitation.

3.11.1 Gateway/Visitor Orientation Point

This is a proposed addition to the site where registration and orientation would take place upon arrival for Phase I of the project. This gateway building would be approximately 50 m², and contain a small office, gates, orientation signage, as well as a parking area (2000 m²) for cars and buses. In addition, a small kiosk serving refreshments and light snacks would be installed.

3.11.2 Workers’ Housing: Eco-Lodging Facilities

Previously built to house the hydroelectric power station workers, these existing buildings will be re-adapted to become Eco-Lodges. Only the external walls and flooring, which are in very poor shape would remain. Twenty of the lodges are proposed to be adapted. The proposed strategy would preserve the existing structural frame and add an additional external wall to create a cavity for natural ventilation. Fans, gas lanterns and candles would replace extensive intrusive electro-mechanical systems. Two options for the overall design of the lodges have been proposed. The first option would emphasis the reconstruction the structures following the original blueprints using pitched tiled roofs. The second option would be to use simple flat roofs of wood and local reed which would alter the original character of the units.

![Figure 29. Eco-Lodges Before and After Renovation](image)
The adaptation of the workers’ houses into eco-lodges would require the following construction / renovation work:

**Walls:**
- Additional external wall to create cavity for ventilation
- external plaster
- external weather coat
- external water proof coat
- internal plaster
- internal paint

**Roof:**
- new ceiling of wood and reed or,
- reconstruct original tile roof

**Flooring:**
- new terrazzo floor finish

**Doors and windows:**
- door leaves, frames and ironmongery
- windows including fittings and accessories

**Bathroom:**
- wall and floor tiles
- fixtures

**Furniture & furnishing:**
- internal benches
- screens
- furniture

The eco-lodging facilities would also require the addition of a small kitchen and dining facility, a reception and information center, parking for golf carts and bicycles, as well as landscaping and the addition of outdoor tents, shading structures, and other communal areas. The kitchen, dining hall, and reception and information center would be equipped with electricity and air conditioning units.
3.12 Railway Station: Bicycle Shop

This very elegant building is envisioned to be converted into a bicycle rental shop. The building is in good condition and does not need any structural consolidation. Reconstruction of a small segment of the original railway is also envisioned as part of the renovation strategy.

Figure 30. Bicycle Shop Plan and Elevation, After Renovation

Figure 31: Bicycle Shop Before and After Renovation
The following renovation works would be required:

- refurbishment for walls, floors and ceiling
- restoration of roof and rainwater pipes
- addition of bike racks/rails
- addition of window
- furniture for office
- reconstruction of railway tracks

In addition a small coffee shop could be added adjacent to the renovated and converted train station.

### 3.12.1 Armed Forces Offices: Panoramic Lookout

A small modest structure with an open loggia with views in all directions, this building would be used in phase I of the project as an orientation point, viewing terrace, and as a display area that highlights the military history of the area. The signage would be improved and binoculars would added to the open terrace. Seating and pergolas would also be added to improve the visitor experience.

### 3.12.2 Yarmouk Lake and Bird Watching Amenities

A new reservoir/shallow lake is proposed in roughly the same location as the original reservoir, in the flooding depression. The reservoir would cover an area of approximately 260,000 square meters and would be surrounded by vegetation zones with special crops for migratory birds

Native marsh vegetation would also be introduced around the lake for aesthetic and habitat value. Carting, biking, and walking trails would lead visitors to this area which will also contain shading, seating, and bird hides.

### 3.12.3 Tracks, Trails, and Signage

The existing roads would be re-used for golf carts, biking, and walking. Additional trials would also be added. Trials would be of simple compacted aggregate finish and work with the existing contours of the land. Interpretative and informational signage would also be added where necessary.

### 3.12.4 Landscape Rehabilitation

Areas of the site would be re-vegetated using native plant species endemic to the area. This would take place over the three phases of the project and would further depend on the allocated water budgets. It is envisioned that after the completion of Phase III, no supplemental irrigation would be needed for the re-vegetated areas.
3.12.5 Fencing

The power station complex would need to be fenced off in Phase I of the project due to health and safety reasons. Sensitive security zones may also be fenced off if necessary.

3.13 Phase II Proposal

The proposal for Phase II includes the following facilities: A visitor center housed in the power station building, a panoramic terrace, an art workshop and Rotenberg’s house.

3.14 Pressure Tank: Panoramic Terrace

This structure is currently in poor shape and suffers from significant structural damage. The view from this building is worthwhile and should be integrated into the visitor experience. It could be converted into a panoramic terrace.

Figure 32. Panoramic Terrace Before and After Renovation

The following renovation works would be necessary to convert this building into a panoramic terrace:
- evaluation of the safety of existing structural elements by specialist
- creation of vehicle routes to access upper building by back filling
- demolition of structurally unstable elements from the upper terrace
- addition of new structural elements
- addition of wood decking and shading structures

A detailed structural assessment needs to take place in the second phase of the feasibility study to determine which elements of the structure could be consolidated, and which ones must be renovated for health and safety reasons.
3.14.1 Power Station: Visitor Center

Proposals for the adaptive reuse of the main power station building include the establishment of a gift shop, café with terrace and exhibition rooms.

- evaluation for the safety of existing structural elements by specialist
- cleaning and the removal of damaged concrete slabs
- re-construction of damaged ceiling panels
- re-shaping of door & window openings
- closing of floor openings
- construction of a new projected balcony to overlook the canal area
- consolidation and addition of staircases and safety railings
- cleaning of turbine and removal of other damaged equipment
- rehabilitation of the canal area by removing damaged slabs and adding new concrete cover
- entrance will receive new floor and damaged stairs will be replaced.
- cleaning of lower canal
- install an electro-mechanical design for the water cycle inside the lower canal
- finishing of walls, floor & ceiling
- addition of kitchen, coffee bar, as well as furniture and furnishings
- cleaning the connecting area between upper and lower buildings (including pipeline)
- reconstructing concrete covers and gates including control access doors
- renovating staircase, adding safety rails
- renovation of lower basement

Figure 33. Visitor Center at Power Station
3.14.2 Transformer Station: Art Workshop

Figure 34: Art Workshop Before and After Renovation

Figure 35: Art Workshop After Renovation, Elevation
Figure 36: Art Workshop After Renovation Plans

- Finishing and refurbishing of walls, floors and ceiling
- Metal staircase to be added
- Add bridge across the existing ditch (in front of this building)

3.15 Phase III Proposal

- Panorama to commemorate the Hattin Battle
- Renovation of Ottoman Bridge at 'Jisr al-Majami'/ Gesher
- Construction of tram and stations
- Possible construction of new bridge
- Army Camp
- Staff Housing and Police Head Quarters

3.15.1 Visitors Circulation in the Park

The proposed visitors' circulation is shown in Figure 37 below. In addition to hiking and biking trails, visitors will be able to use a railroad to observe the landscape. An additional train station will be added close to the Power Station building; the existing tracks and stations at Naharyim and 'Jisr al-Majami'/ Gesher will be renovated.
4 Market Analysis

4.1 Overview

Tourism has become a popular global leisure activity, and from a financial point of view, tourism is considered as one of the major pillars of the national economy. Tourism's share of a nation’s economy varies from one country to another depending on the available attractions, safety, expertise, infrastructure, simplicity of procedures and the use of proper marketing/promotional strategy.

According to the United Nations World Tourism Organization (UNWTO):

- in 2007 there were over 898 million international tourist visits (6.5% growth per year between 1950-2007);
- international tourism receipts totaled US$ 733 billion, or 2 US$ billion a day;
- in 2006 tourism represented around 35% of the world’s exports of services and over 70% in Least Developed Countries;
- 1.6 billion international tourist visits are forecasted worldwide by 2020.

![World Tourist Arrivals](image)

**Figure 38. World Tourist Arrivals**

4.2 Ecotourism

Depending on the objective; tourism is divided into many types, for example heritage tourism, cultural tourism, sports tourism, health/wellness tourism, religious tourism, ecotourism and many others.

Ecotourism is now considered the fastest growing trend in global tourism. According to the International Ecotourism Society; ecotourism has been growing 20% - 34% per year since 1990. Since 2004 ecotourism/nature tourism has been growing 3 times faster than the tourism industry as a whole worldwide.
“Experiential” tourism - which encompasses ecotourism, nature, heritage, cultural and soft adventure tourism, as well as sub-sectors such as rural and community tourism –is among the sectors expected to grow the most over the next two decades.

In addition, according to the United Nations Environment Program (UNEP) and Conservation International, most of the expansion in the tourism sector is occurring in and around the world’s remaining natural areas. Analysts predict growth in eco-resorts and hotels and a boom in nature tourism - a sector already growing at 20% a year - and suggest early converts to sustainable tourism will make market gains.

In addition, eco-tourists have many preferable characteristics as opposed to other tourist-types as they are generally more experienced travelers, holding higher levels of education, coming from higher income brackets, and falling into the middle-age to elderly age bracket.

In the current study, the ecological and nature orientated tourism sector is the main target for the proposed Jordan River Peace Park.

4.3 Tourism in Jordan

4.3.1 Overview, present situation and future outlook

Jordan is rich in natural and cultural heritage and its geographical and climatic diversity as well as some of the most advanced medical and education systems in the region attracts visitors from all over the world for a variety of different tourism experiences. Luxury hotels are emerging throughout Jordan, especially in Amman, Aqaba, Petra and the Dead Sea region. Many facilities including hotels, resorts, restaurants, parks, and chalets are currently under construction. The private sector is actively involved in promoting tourism and investing large amounts of capital in the sector.

Likewise, the government recognizes that tourism is an essential and vibrant sector that will contribute to improving the long-term economic and social well-being of Jordanians and is facilitating investment in the tourism sector and actively providing appropriate infrastructure and an adequate legislative and regulatory framework.

Tourism is of vital importance to the national economy of Jordan. It is the Kingdom's largest export sector, the second largest private sector employer and the second highest producer of foreign exchange. **Tourism contributes to approximately 10 percent of the country's gross domestic product (GDP).**

In 2004, the Ministry of Tourism and Antiquities in Jordan launched the Jordan National Tourism Strategy 2004–2010, setting a goal to double Jordan’s tourism economy in real terms by 2010.
The strategy is designed to bring about the following results by 2010:

- Increase tourism receipts from JD570 million in 2003 to 1.3 billion (US$ 1.84 billion).
- Increase tourism-supported jobs from 40,791 in 2003 to 91,791, thus creating over 51,000 jobs.
- Achieve a taxation yield to the government of more than JD455 million (US$637 million).

The strategy targets the following priority markets:

- Cultural Heritage (Archaeology).
- Religious Tourism
- Ecotourism
- Health and wellness
- Adventure Tourism
- Business meetings, incentives, conferences and events
- Cruising
- Bird Watching

It is worthwhile mentioning that in recent years the ecological/natural attractions in Jordan such as Debbin, Dana, Azraq, Zay, Wadi Moujeb, Rum and others have attracted more and more local tourists as people are escaping the increasing pressure of life in the noisy and polluted cities. In addition, domestic spending on tourism activities has noticeably increased in the past few years.

4.3.2 Statistical data

The following statistics provide important tourism indicators in Jordan:

<table>
<thead>
<tr>
<th>Table 14: Hotel Facilities and Number of Workers, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hotels, apartments, suites, etc.</strong></td>
</tr>
<tr>
<td>Classification</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>5 Star</td>
</tr>
<tr>
<td>4 Star</td>
</tr>
<tr>
<td>3 Star</td>
</tr>
<tr>
<td>2 Star</td>
</tr>
<tr>
<td>1 Star</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Apartments B</td>
</tr>
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</table>
### Table 15. Overnight Tourists and Same Day Visitors by Month, 2007

<table>
<thead>
<tr>
<th>Month</th>
<th>Overnight Visitors</th>
<th>Same Day Visitors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>285,927</td>
<td>253,782</td>
<td>539,709</td>
</tr>
<tr>
<td>February</td>
<td>234,184</td>
<td>184077</td>
<td>418,262</td>
</tr>
<tr>
<td>March</td>
<td>262,338</td>
<td>191333</td>
<td>453,670</td>
</tr>
<tr>
<td><strong>1st Qtr</strong></td>
<td><strong>782,449</strong></td>
<td><strong>629192</strong></td>
<td><strong>1,411,641</strong></td>
</tr>
<tr>
<td>April</td>
<td>290,596</td>
<td>222,532</td>
<td>513,128</td>
</tr>
<tr>
<td>May</td>
<td>253,504</td>
<td>250,429</td>
<td>503,933</td>
</tr>
<tr>
<td>June</td>
<td>300,393</td>
<td>322,670</td>
<td>623,063</td>
</tr>
<tr>
<td><strong>2nd Qtr</strong></td>
<td><strong>844,493</strong></td>
<td><strong>795,632</strong></td>
<td><strong>1,640,125</strong></td>
</tr>
<tr>
<td>July</td>
<td>383,729</td>
<td>375,976</td>
<td>759,705</td>
</tr>
<tr>
<td>August</td>
<td>451,974</td>
<td>373,056</td>
<td>825,030</td>
</tr>
<tr>
<td>September</td>
<td>265,749</td>
<td>297,363</td>
<td>563,112</td>
</tr>
<tr>
<td><strong>3rd Qtr</strong></td>
<td><strong>1,101,452</strong></td>
<td><strong>1,046,395</strong></td>
<td><strong>2,147,847</strong></td>
</tr>
<tr>
<td>October</td>
<td>245,521</td>
<td>222,056</td>
<td>467,577</td>
</tr>
<tr>
<td>November</td>
<td>195,282</td>
<td>144,623</td>
<td>339,905</td>
</tr>
<tr>
<td>December</td>
<td>261,762</td>
<td>259,769</td>
<td>521,531</td>
</tr>
<tr>
<td><strong>4th Qtr</strong></td>
<td><strong>702,565</strong></td>
<td><strong>626,448</strong></td>
<td><strong>1,329,013</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,430,959</strong></td>
<td><strong>3,097,666</strong></td>
<td><strong>6,528,625</strong></td>
</tr>
</tbody>
</table>
The Jordan Times Daily reported on June 22, 2008 that according to the Minister of Tourism and Antiquities Maha Khatib, visitors on package tours nearly doubled during the first five months of this year (2008) with an increase from 138,443 to 206,900 visitors between January and May this year compared to the same period in 2007, as seen in the graph below. This led to a marked increase in activity in hotels and tourist sites across the country.
Minister Khatib noted that European tourists constituted the largest segment of these visitors, with the rate of visits increasing by 55 per cent to 133,814 visitors compared to 86,513 in the first five months of last year. The figures also indicated an increase in visitors on package tours from Asia, the Pacific and the United States, with visits from these regions going up by 38 per cent and 80 per cent respectively.

According to the figures, the number of nights spent by tourists also went up by 51 per cent - from 603,661 nights in the first five months of last year to 907,180 nights in the same period of this year - with five being the average number of nights spent in hotels. In addition, tourism sites across the country registered a 60 percent increase in visitors between January and May.

The ancient city of Petra attracted the largest segment of these tourists. The visitors rate rose 62 percent to 359,957 visitors in the first five months of this year compared to 223,084 during the same period last year. Jerash followed with 149,400 tourists compared to 88,300 last year, while Madaba’s famous mosaic map attracted 132,368 visitors compared to 63,694 during the same period of 2007. Likewise, the number of visitors to Mount Nebo rose 89 per cent to 139,503 from 73,084 last year and tourists to the Baptism Site went up 73 per cent from 38,145 to 65,880.

Minister Khatib said that despite the challenges facing the region, the Ministry and the Jordanian Tourism Board were reporting positive indicators for continued growth in the tourism industry and ongoing efforts to further increase the sector would continue.

4.3.3 Challenges

Despite its advantages and importance to the economy, Jordan's tourism sector is performing at a level below its potential.

The prospering tourist industry in Jordan is faced with several challenges; such as:

- Insufficient tourist infrastructure, especially in peak seasons.
- Concentration of tourist facilities and services in the capital, Amman and the three other major attractions (Petra, Aqaba and the Dead Sea).
- Insufficient promotional activities
- Lack of adequate service professionals to cater to a growing tourism sector

4.4 Tourism in Israel

The State of Israel has an advanced tourism infrastructure. The ecological/nature tourism is well established with a large network of national parks, reserves and cultural heritage sites including areas geared specifically towards bird watching.

The tourism sector is one of the strongest indicators for economic growth with a direct and proven contribution to the GDP of 20 billion shekels in 2007 and an overall contribution of 40 billion shekels. Furthermore, the tourism industry directly employs 95,000 workers and indirectly creates 180,000 jobs.

The Israeli Ministry of Tourism reports a 25% increase in the number of incoming tourists in 2007 and a 51% increase in the first months of 2008 compared to the same period in 2007. The problem of safety/security remains the most challenging factor facing the tourism industry in Israel.

4.1 Tourists visits, hotel distribution

4.1.1 General

In 2007 local tourism reached a peak of more than 12 million nights in hotels throughout Israel. The revenues from local tourism (composed of the number of hotel nights, events and other hotel services) and from incoming tourists were more than $3.2 billion between January and September, 2007. In 2006 more than 46,000 rooms were available in Israel. An analysis of rural accommodations in Israel in 2005, shows that 7,700 rooms were available and tourists spent nearly 2.2 million nights in hotels during that year. Revenue from rural accommodation in 2005 reached nearly 360 billion NIS.

In 2005 about 64% of the lodgings in Israel were made by local tourists, as opposed to 82% in 2002, mainly due to the second Intifada. A survey by Ernest and Young for the Ministry of Tourism in 2005 found that 22% of the incoming tourists preferred to stay at five star hotels, 31% prefer four star hotels and 34% preferred three star hotels.

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Important tourism areas in Israel in the vicinity of the Jordan River Peace Park include Tiberias, the Jordan Valley Regional Council, Beit Shean City and the Beit Shean Regional Council (Valley of Springs Regional Council).

4.1.1.1 Tiberias

Between the years 2000 and 2006 more than 2,000,000 international travelers lodged in one of the 4,000 hotel rooms that Tiberias offers. In the same period the city hosted nearly 6,000,000 local travelers. In 2006, local tourism was greatly hurt due to the Second Lebanon War, but in 2007 the hotels reported a high percentage of room occupancy.

Room occupancy in 2006 stood at an average of 44.8%. Out of the 28 hotels that operate in Tiberias, 24 are members of the Israel Hotel Association, which coordinates and manages tourist needs in the area. Besides the larger hotels, there are tens of smaller hotels that have no connection to the Hotel Association and usually serve local tourists and residents. 1.6 million people stayed overnight in the local hotels in 2005 (1.2 million Israelis and 398,000 international travelers). The area has more than 50 restaurants specializing primarily in local and oriental food. Tourism in Tiberias and the surround area is primarily geared towards religious tourism/pilgrims due to its proximity to the many important Christian sites in the surrounding area.

---

13 Source: Israel hotel Association, Tiberias.
<table>
<thead>
<tr>
<th>Visitors to Tiberias (in thousands)</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>828.4</td>
<td>2000</td>
</tr>
<tr>
<td>160.2</td>
<td>2001</td>
</tr>
<tr>
<td>70</td>
<td>2002</td>
</tr>
<tr>
<td>91.4</td>
<td>2003</td>
</tr>
<tr>
<td>158.9</td>
<td>2004</td>
</tr>
<tr>
<td>331.7</td>
<td>2005</td>
</tr>
<tr>
<td>398.6</td>
<td>2006</td>
</tr>
</tbody>
</table>

4.1.1.2 The Jordan Valley Regional Council

In addition to the numerous important Christian sites mentioned above, there are many attractions in the communities and natural areas surrounding Lake Tiberias. Several of these sites host hundreds of thousands of visitors every year including Hamat Gader, (nearly 700,000 tourists - 3% of the foreign tourist), the Yardenit Baptism site on the Jordan River (500,000 tourists – 95% of foreign tourists), Abu – Kayak (150,000 tourists – 20% of incoming tourists)\(^{14}\). In addition the Jordan Valley has numerous small and medium scale attractions including nine official beaches, more than twenty museums and historical sites, nearly twenty recreational sites and late night attractions and tens of restaurants.

Outside the city of Tiberias, in the area that surrounds Lake Tiberias, there are nearly 900 additional rooms (2,600 beds) in hotels and vacation villages to accommodate visitors. Fourteen other sites in the area add another 500 rooms for a total of 2,200 rooms\(^ {15}\). Nearly 2.2 million tourists (foreign and domestic) stay overnight in these local rooms with an average of 1.5 nights per person.

Between 1.7 and 2.1 million local/domestic tourists visit the area every year. Out of this number between 1.1 and 1.3 million people are independent visitors, 0.4 to 0.5 million visit in organized groups and 0.2 to 0.3 million are visiting as part of a school trip. The total number of accommodation nights spent by local tourism is between 1.9 and 2.1 million. Moreover, 0.9 million international tourists visit the area every year. 0.8 million visitors come in organized groups (mostly pilgrims), and 0.1 million are visiting in family groups. The total number of accommodation nights spent by the international tourists is 1.3 million.

4.1.1.3 Beit Shean Valley Regional Council (Valley of Springs Regional Council)

According to information from the Beit Shean Valley Regional Council's tourism department, approximately 750,000 local tourists choose to spend their vacation in the area every year, while international tourism adds another 25,000 visitors. A survey conducted in 2007 shows that 47% of area visitors choose to stay in rural

\(^{14}\) Jordan Valley regional council – Tourism department

\(^{15}\) Jordan Valley regional council – Tourism department
accommodations (33% preferred to stay in kibbutzim and 14% preferred moshavim), 27% in relatives’ houses in the area, 16% in a hotel in the area (in Tiberias for example), and 10% in local hostels\(^\text{16}\). Currently there are nearly 140 rural accommodation rooms available in the Jordan Valley with plans to add another 530 rooms in the next five years. There are no hotels in the Beit Shean Valley but three Kibbutzim (Gesher, Nir David and Ma'ale Gilboa) plan to open hotels with a total of 230 new rooms.

There are approximately eleven medium scale attractions in the Beit Shean Valley that charge entrance fees including Gan Hashlosha National Park has 230,000 visitors per year, Kangaroo Gardens is visited by 82,000 guests and the Cochav Hayarden/Belvoir National Park, Gani Huga Spring and Pools and Old Gesher attracts a combined total of 140,000 visitors per year\(^\text{17}\). More than 20 other sites in the area do not charge an entrance fee including the Mt. Gilboa Forests and Nature Reserves which host more than 200,000 visitors a year. There are more than twelve restaurants in the area offering catering services and hot meals to the visitors.

### 4.1.2 Tourism Revenues

The average expenditure for an incoming/international tourist in Israel was $915 per visit in 2005. This amount is mostly spent on hotels and accommodation (40%), shopping (25%), transportation (15%), food and beverage (13%) and other items (7%) with an average lodging revenue of $74 per night\(^\text{18}\).

\(^{16}\) The survey was conducted by the Geo-cartography Institute by the order of the River and Drainage Authority of Southern Jordan, the Ministry of Tourism, Ministry of Agriculture and the River Administration in the Ministry of the Environmental protection. The final report is due in May 2008.


### Table 17. Number of International Visitors in Israel by Month

<table>
<thead>
<tr>
<th>Month/Year</th>
<th>Occupancy (%)</th>
<th>International Visitors</th>
<th>International Lodging</th>
<th>Revenue from Int. visitors (Million $)</th>
<th>Int. visitor Lodging Revenue per night ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-04</td>
<td>40</td>
<td>117,900</td>
<td>351,900</td>
<td>22.6</td>
<td>64</td>
</tr>
<tr>
<td>Feb-04</td>
<td>42</td>
<td>88,700</td>
<td>301,900</td>
<td>22</td>
<td>73</td>
</tr>
<tr>
<td>Mar-04</td>
<td>42</td>
<td>87,400</td>
<td>279,800</td>
<td>20.2</td>
<td>72</td>
</tr>
<tr>
<td>Apr-04</td>
<td>51</td>
<td>11,440</td>
<td>468,100</td>
<td>39.8</td>
<td>85</td>
</tr>
<tr>
<td>May-04</td>
<td>48</td>
<td>109,800</td>
<td>370,200</td>
<td>27.7</td>
<td>75</td>
</tr>
<tr>
<td>Jun-04</td>
<td>54</td>
<td>108,200</td>
<td>338,300</td>
<td>24.6</td>
<td>73</td>
</tr>
<tr>
<td>Jul-04</td>
<td>59</td>
<td>126,700</td>
<td>426,800</td>
<td>27.2</td>
<td>64</td>
</tr>
<tr>
<td>Aug-04</td>
<td>71</td>
<td>163,500</td>
<td>720,600</td>
<td>48.5</td>
<td>67</td>
</tr>
<tr>
<td>Sep-04</td>
<td>46</td>
<td>81,600</td>
<td>262,300</td>
<td>21</td>
<td>80</td>
</tr>
<tr>
<td>Oct-04</td>
<td>57</td>
<td>118,900</td>
<td>443,600</td>
<td>35.3</td>
<td>80</td>
</tr>
<tr>
<td>Nov-04</td>
<td>50</td>
<td>117,400</td>
<td>389,300</td>
<td>29.5</td>
<td>76</td>
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<tr>
<td>Dec-04</td>
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<td>139,900</td>
<td>418,500</td>
<td>30.3</td>
<td>72</td>
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<tr>
<td>Jan-05</td>
<td>42</td>
<td>140,400</td>
<td>435,300</td>
<td>28.5</td>
<td>65</td>
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<tr>
<td>Feb-05</td>
<td>43</td>
<td>111,800</td>
<td>350,700</td>
<td>26.2</td>
<td>75</td>
</tr>
<tr>
<td>Mar-05</td>
<td>51</td>
<td>161,300</td>
<td>505,300</td>
<td>36.8</td>
<td>73</td>
</tr>
<tr>
<td>Apr-05</td>
<td>61</td>
<td>156,200</td>
<td>603,500</td>
<td>51</td>
<td>85</td>
</tr>
<tr>
<td>May-05</td>
<td>56</td>
<td>180,900</td>
<td>592,900</td>
<td>45.6</td>
<td>77</td>
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<tr>
<td>Jun-05</td>
<td>60</td>
<td>171,800</td>
<td>543,600</td>
<td>40.4</td>
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<tr>
<td>Jul-05</td>
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<td>208,800</td>
<td>723,400</td>
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<tr>
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<td>526,500</td>
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<td>74</td>
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<tr>
<td>Nov-05</td>
<td>62</td>
<td>207,800</td>
<td>642,600</td>
<td>45.3</td>
<td>70</td>
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<tr>
<td>Dec-05</td>
<td>54</td>
<td>173,600</td>
<td>538,200</td>
<td>40</td>
<td>74</td>
</tr>
</tbody>
</table>
4.1.2.1 Tiberias
Local visitors spent nearly 244.4 million NIS in 2006 on hotels and lodging\textsuperscript{19}.

<table>
<thead>
<tr>
<th>Period</th>
<th>Tiberias Revenue, Per Room (US $ in thousands)</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>25.7</td>
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<td>--</td>
<td>2005</td>
</tr>
<tr>
<td>2006</td>
<td>20.2</td>
<td>2006</td>
</tr>
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Table 18. Revenues for Tiberias Area

<table>
<thead>
<tr>
<th>Period</th>
<th>Tiberias Tourists (person/night in thousands)</th>
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</thead>
<tbody>
<tr>
<td>1991</td>
<td>245.8</td>
</tr>
<tr>
<td>1992</td>
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<td>1993</td>
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<td>1996</td>
<td>766.0</td>
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<td>1997</td>
<td>690.9</td>
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<td>1998</td>
<td>593.7</td>
</tr>
<tr>
<td>1999</td>
<td>806.6</td>
</tr>
<tr>
<td>2000</td>
<td>828.4</td>
</tr>
<tr>
<td>2001</td>
<td>160.2</td>
</tr>
<tr>
<td>2002</td>
<td>70.0</td>
</tr>
<tr>
<td>2003</td>
<td>91.4</td>
</tr>
<tr>
<td>2004</td>
<td>158.9</td>
</tr>
<tr>
<td>2005</td>
<td>331.7</td>
</tr>
<tr>
<td>2006</td>
<td>398.6</td>
</tr>
</tbody>
</table>

Table 19. Number of Tourists in Tiberias

\textsuperscript{19} Source: Israeli Central Bureau of Statistics http://www.cbs.gov.il/ts/databank/building_func_e.html?level_1=19
4.1.2.2 The Jordan Valley

In 2005 240,400 rural lodging facilities in the Lake Tiberias area brought in a total revenue of 32 million NIS.

4.1.2.3 Beit Shean Valley

It is estimated that the revenue from rural accommodation in the Beit Shean Valley amounts to approximately 10 million NIS a year. The entrance fees to the local sites and reserves bring in another 20 million NIS. There is no information concerning the revenue from local services. According to a survey made by the Geo-Cartography Institute most of the local tourists would not agree to pay an entrance fee to the reserves in the area, while only 20% of the people answered that they would be willing to pay a maximum of 10 NIS per entrance. 90% of the visitors came to the area with a pre-planned course and nearly 70% indicated that they would gladly come back to the area.

4.1.3 Ecological tourism

Demand for ecological tourism in the World: More than 66% of the American and Australian tourists and nearly 90% of the British tourists define ecological and environmental activities as part of the hotel's accommodation package during their stay. These tourists expect hotels to offer and support ecological activities and services. In Germany 65% (39 million) of the tourists expect products that protect and preserve the environment in the tourist "package." According to a survey, which was conducted by the VISIT association, it was found that 70% of the British and American tourists said they would gladly pay another $150 for a two-week stay in an ecological hotel. 39% of British tourists said that they would pay an extra 5% for lodging if they perceived ethical responsibility.

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20 Out of the 240,000 stays: 201,000 by local tourists and 38,900 by international tourists.
21 The survey was conducted by the Geo-Cartography Institute.
22 www.ecotrans.org/visit/brochure/fr/071.htm
23 www.ecotrans.org/visit/brochure/fr/071.htm
4.1.4 Ecological tourism in Israel

In the last few years the ecological approach to tourism has penetrated local businesses and attractions in the areas around Lake Tiberias. While ecological tourism has not developed greatly in the area, more and more local businesses have begun to implement the basic ideas in their daily life. Eco-tourism standards developed in other areas of the world are being imported and adopted by local entrepreneurs. While the number of certified providers are still few the number is expected to grown as rural operators adopt the eco-tourism standards.

4.2 Target Groups

Eco-tourism in the Jordan River Peace Park is aimed at a attracting a specific clientele. The visitor profiles most likely to be interested in visiting Bakoura area include the following:

1. **Birdwatchers** (independent or in organized tours): This high-end eco-tourism sector is mainly focused on birds observation and photography, with additional visits to area natural sites/features and cultural heritage sites. For these visitors highlights include spotting rare local and migratory birds such as the Pygmy Cormorants, Palestine Sunbird and the Brown Fish Owl (believed to be extinct). These visitors are most likely to stay overnight multiple nights as bird observation is an early morning activity. These visitors are predominately European and North American with emerging markets in other areas of the world.

2. **General Sight-Seeing** (independent or in organized tours): This sector is focused on visits to natural and cultural heritage sites with a particular focus on historical and archeological sites. A particular highlight for this group would be the possibility of visiting the hydroelectric power station. These visitors are anticipated to be primarily day visitors from Jordan and Israel.

3. **Foreign Nationals Working in Jordan** (independent or in organized tours): As an important and central Middle Easter country Jordan is home to hundreds of thousands foreign nationals working in a variety of international government and non-governmental agencies. Like their local counter-parts they are interested in visiting the area's natural and cultural heritage sites but could also be interested in birdwatching and are expected to stay overnight.

4.2.1 Target market

There are basically two types of visitors that would/will be interested in the Jordan River Peace Park; those with an existing predisposition towards nature and travel to natural sites (who travel due to personal motivation) and “made” eco-tourists – people who are visiting area cultural heritage sites and could be convinced to spend additional time in the area to enjoy the additional attraction of the Jordan River Peace Park.

Age and financial conditions will not be critical parameters for identifying the typical visitor. In general terms, the target visitors of a small-scale ecotourism scheme will be
visitors of medium/high education level, well-informed, ecologically sensitive, cost-conscious, and passionate about nature. They will tend to be “travelers” rather than tourists – the difference being mainly their curiosity and will-to-learn drive. They will spend typically 1-2 days in the Jordan River Peace Park. The market should target local, national, and international levels, both visitors traveling independently and those in organized tours.

4.2.2 Potential Competition

The rich tourism markets in Israel and Jordan provide both opportunities to create linkages and expansions upon the current tourism routes and major sites as well as potential competition destinations for the Jordan River Peace Park.

Jordan

- Petra: selected as one of the New Seven Wonders of the World, draws thousands of visitors a year
- Wadi Rum
- Dana Nature Reserve: well marketed but with a limited capacity to accommodate visitors, requiring reservation months in advance.
- Zubia Nature Reserve
- Newly established special protection areas in the Jordan Valley including Safi-Viva, Qatar, and Yarmouk

Israel

In Israel several attractions in close proximity to the proposed Jordan River Peace Park could compete with the park in drawing visitors.

Hula Lake offers a similar experience to the proposed park activities and is a well publicized site. Over 250,000 people visit Hula Lake a year. Initial investment for the restoration of Hula Lake was 90 million NIS, paid for by the Jewish National Fund and break-even point was reached within three years of operation.

Lake Tiberias area has well developed tourism and recreational infrastructure. Currently, visitors to sites in the area of the proposed Jordan River Peace Park such as 'Jisr al-Majami'/ Gesher and Naharyim choose to stay overnight in the area of Lake Tiberias instead of the communities adjacent to the sites.

Other international destinations may also pose significant competition such as other cross border parks in areas of particular natural beauty.

4.2.3 Competitive Advantages

The proposed area of the Jordan River Peace Park has long functioned as a restricted military zone, with very limited access to Bakoura on Jordanian side and, as such, is not
well publicized or known. The novelty of opening an area long restricted to visitors would offer the area a competitive advantage. Other competitive advantages include:

- Bakoura is amongst the best preserved multi-ecosystem habitats in Jordan.
- The site has a unique history shared by both Israelis and Jordanians.
- There is a great deal of interest on the part of Israeli tourists to visit and view the Rotenberg Power Station and to learn more about the history of the area and the role the station had in the pre-state period.
- The site plays an important role in Islamic history as the site of the battle of Hattin.
- The Peace Park could be easily incorporated with visits to other natural and cultural heritage sites in the area.
- The Peace Park unique position as a cross border park could encourage visitors from both Jordan and Israel who want to spend the night in the other country without having to formally cross the border.

5 Jordan River Peace Park Financial/Economic Feasibility

The main objective of this part of the study is to investigate the financial and economic feasibility of the proposed project. The financial and economical components of feasibility are fundamental for sound decision making. In line with other components of the study, the analysis was conducted in the following steps:

- Several field visits to the Bakoura site and similar facilities in Israel were made;
- In collaboration with other team members, several previously prepared and available studies on the project and the site were reviewed;
- Identifying different components necessary for the preparation of the study;
- Based on the designs for the different components of the project site (engineering drawings, technical specifications) and in collaboration with the other team members, preliminary cost estimates were prepared for each of the designed components;

The classical cost/benefit analysis methodology was applied in this study. The cost-benefit (C/B) analysis is based on calculating several financial indicators, which signify whether the project is feasible or not. However, since there are many assumptions made in the study and there are many variables that are subject to change, the base case analyses are followed by sensitivity analysis. This sensitivity analysis involves carrying out the C/B analysis with several variations on certain major variables.

The classical approach to financial study begins with a detailed presentation of project cost items. These costs include the investment and operation costs. Subsequently, revenue derived from the project is determined. Additional assumptions and bases of calculations are also presented in this section. The main components of financial/economic feasibility are:
5.1 **Estimate total investment (capital) requirements**

The following items were considered in assessing the total capital requirements.

- Assess the capital needs of the project and how these needs will be met.
- Estimate capital requirements for facilities, equipment and inventories.
- Replacement capital requirements and timing for facilities and equipment.
- Estimate working capital needs.
- Estimate start-up capital needs until revenues are realized at full capacity.
- Estimate other capital needs.

Table 20 below presents the detailed investment costs based on estimates made by the engineering team. The estimates were based on the implementation of two phases. The first will be conducted over a period of 10 years, while the second will take place after the tenth year of the project. As indicated in the table, the total investment needed for implementing the first phase is JD 4,570,000. The cost of the second phase is expected to approach JD 5,400,000 including costs associated with the rehabilitation of the hydroelectric power station facilities. Total investment cost of the project are thus estimated at JD 9,970,000.

**Table 20: Investment Costs of the Peace Park (Phases I & II)**

<table>
<thead>
<tr>
<th>PHASE I COST ESTIMATE</th>
<th>Cost (JD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Connection between Main Road and Main Gateway</td>
<td>60,000</td>
</tr>
<tr>
<td>Main Gateway / Visitor Orientation Point</td>
<td>100,000</td>
</tr>
<tr>
<td>Visitor Parking (for cars and buses) - 2000 m²</td>
<td>260,000</td>
</tr>
<tr>
<td>Reception for Lodges and Information Center (100 m²)</td>
<td>250,000</td>
</tr>
<tr>
<td>Storage and Parking for Bicycles and Golf Carts</td>
<td>20,000</td>
</tr>
<tr>
<td>Eco-Lodges (20 Units) Renovation with furniture per unit with clay roof tiles</td>
<td>700,000</td>
</tr>
<tr>
<td>Infrastructure and Basic Facilities for the Lodges</td>
<td>1,700,000</td>
</tr>
<tr>
<td>Railway Station / Bicycle Shop</td>
<td>140,000</td>
</tr>
<tr>
<td>Fencing and Gates for separation of Phases (Chain link)</td>
<td>20,000</td>
</tr>
<tr>
<td>Panorama</td>
<td>100,000</td>
</tr>
<tr>
<td>Bird Hides, Shade Structures (Pergolas), and Benches</td>
<td>320,000</td>
</tr>
<tr>
<td>Trails and Tracks (2 km length, 2.5 m width)</td>
<td>200,000</td>
</tr>
<tr>
<td>Yarmouk Lake Rehabilitation</td>
<td>150,000</td>
</tr>
<tr>
<td>Site Landscaping and Infrastructure</td>
<td>350,000</td>
</tr>
<tr>
<td>Marketing and Promotion Campaign</td>
<td>100,000</td>
</tr>
<tr>
<td>Water management plan</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Sub-Total (Phase I)</strong></td>
<td><strong>4,570,000</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHASE II COST ESTIMATE</th>
<th>Cost (JD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Station/Turbine Building - Upper Part</td>
<td>1,750,000</td>
</tr>
<tr>
<td>Power Station/Turbine Building - Lower Part</td>
<td>3,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>--------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Lower Channel</strong></td>
<td>500,000</td>
</tr>
<tr>
<td><strong>Power Station Subsidiary Building</strong></td>
<td>150,000</td>
</tr>
<tr>
<td><strong>Sub-Total (Phase II)</strong></td>
<td>5,400,000</td>
</tr>
<tr>
<td><strong>Grand Total (all capital costs)</strong></td>
<td>9,970,000</td>
</tr>
</tbody>
</table>

5.2 Expected running costs and returns

The table below includes the estimated operational costs during the life span of the project, which is expected to last for a minimum of 25 years. The annual running costs, which cover many aspects including security plan and marketing of the site, were estimated at JD 460,000.

**Table 21: Annual Running Costs of the Jordan River Peace Park (Phase I & II)**

<table>
<thead>
<tr>
<th>Annual Running Costs of the Jordan River Peace Park</th>
<th>JD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yearly Running Costs</strong></td>
<td></td>
</tr>
<tr>
<td>Water, electricity, kitchen, maintenance, and employee salaries (Eco-lodges)</td>
<td>200,000</td>
</tr>
<tr>
<td>Site management</td>
<td>60,000</td>
</tr>
<tr>
<td>Security plan</td>
<td>150,000</td>
</tr>
<tr>
<td>Promotion and marketing</td>
<td>50,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>460,000</td>
</tr>
</tbody>
</table>

The project returns were estimated based on the following assumptions:

- The life span of the project is 25 years;
- The life span is divided into two phases: The first extends from 2009-2019 while the second phase starts in 2020 and continues until 2034;
- The project cost estimates are calculated in real-term constant prices of the year 2007, as they are expected to be the same as the base year. The year (0) is the base year when the investment occurs.
- Five main sources of revenue were identified for this project in the two phases:
  - Based on the contingent valuation studies made on other sites, like Dibeen National Park, it is assumed a minimum entrance fee of JD 0.5 can be collected from local (Jordanian) visitors;
  - It is also assumed that an entrance fee of JD 2.00 per visitor will be collected from international (non-Jordanian) visitors. Non-Jordanian visitors pay higher entrance fees for other Jordanian sites;
  - Revenues from guided tours for Jordanian and non-Jordanian visitors;
  - Revenues from renting bicycles for both Jordanian and non-Jordanian visitors;
  - Revenues made by the lodge from both Jordanian and non-Jordanian visitors over a period of 270 days per year. The summer season was excluded since it is expected to be too hot in the area.
• The total number of local visitors per year is expected to reach a maximum of 250,000 based on conservative estimates made after observing three similar sites in Israel;
• The total number of international tourists is expected to increase gradually to 50,000 by the end of phase I. While the number is expected to increase, also gradually, after implementing phase II to reach to a maximum of 200,000 by the year 2034.
• A salvage value of all project facilities is assumed to be 20% of the total investment costs, which will be added as revenue earned in the last year of the project.

5.3 Financial/Economic analysis

As in the case of all new business opportunities, financial analysis is a must to determine the viability of the new venture. The proposed project will require capital and human resources. The main sources of funding include self-financing, grants and/or loans. Three financial measures were used in the analysis. These measures include: 1) Net Present Value; 2) Benefit/ Cost Ratio; and 3) Internal Rate of Return.

The Net Present Value (NPV) compares the present value of the costs with the present value of the benefits not as a ratio subtracting costs from benefits to find the net benefits \[ B-C=\text{Net Benefit} \].

The Benefit-Cost Ratio (BCR) compares the present value of the cost with the present value of the benefit, each discounted at the same rate. The comparison is made by forming the ratio of the present value of benefits to the present value of costs.

The third criterion for summarizing the benefit and cost effects of a project alternative is the Internal Rate of Return (IRR). The IRR represents the rate of return in economic prices that would be achieved on all expenditures of the project. The IRR is calculated using the net benefits obtained by subtracting year by year all costs from all benefits. The IRR is the rate of discount for which the present value of the net benefits becomes zero.

To estimate the above three measures, cash flow was estimated based on the previous assumptions for expected costs and returns. Cash flow analysis is an important tool that shows the movement of money into and out of the proposed project. In other words, it is the rotation of cash inflows and outflows that establishes whether the proposed business is solvent. It also involves examining the different components that may impact cash flow. Cash flow was thus estimated as the difference between the total costs (capital and recurrent cost) and the revenues of the project. The capital costs consist of the estimated costs of the renovation of the site and the additional costs for annual maintenance over the lifespan of the project, which were provided by the engineering consultants.

As indicated above, cash flow is estimated for 25 year period, where year 2009 is the base year (0) for the analysis. Table 3 shows the cash flow of the project for phase I of the project (2009-2019).

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</thead>
<tbody>
<tr>
<td>PHASE I</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Revenues (Total Cash Inflows)</td>
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<td>816,250</td>
<td>917,750</td>
<td>1,121,250</td>
<td>1,263,750</td>
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<td>1,297,500</td>
<td>1,308,750</td>
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<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
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<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
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<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
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<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Promotion and marketing</td>
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<td>25,000</td>
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<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
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<td>50,000</td>
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<td>Total Operational Costs (TVC)</td>
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<td>460,000</td>
<td>460,000</td>
<td>460,000</td>
<td>460,000</td>
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<td>460,000</td>
<td>460,000</td>
<td>460,000</td>
<td>460,000</td>
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<tr>
<td>Fixed Costs (Phase I)</td>
<td></td>
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</tr>
<tr>
<td>Main Gateway / Visitor Orientation Point</td>
<td>30,000</td>
<td>30,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Visitor Parking (for cars and buses) - 2000 m²</td>
<td>130,000</td>
<td>130,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Geodetic and Topographic Survey</td>
<td>125,000</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Entrance fee for local visitors</td>
<td>5,000</td>
<td>10,000</td>
<td>15,000</td>
<td>20,000</td>
<td>25,000</td>
<td>30,000</td>
<td>35,000</td>
<td>40,000</td>
<td>45,000</td>
<td>50,000</td>
<td>0</td>
</tr>
<tr>
<td>Entrance fee for int. visitors</td>
<td>19,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Guided tours (local &amp; int. visitors)</td>
<td>2,500</td>
<td>5,000</td>
<td>10,000</td>
<td>15,000</td>
<td>20,000</td>
<td>25,000</td>
<td>30,000</td>
<td>35,000</td>
<td>40,000</td>
<td>45,000</td>
<td>0</td>
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<tr>
<td>Water, electricity, kitchen, maintenance, and employee salaries (Eco-Lodges)</td>
<td>50,000</td>
<td>100,000</td>
<td>200,000</td>
<td>300,000</td>
<td>400,000</td>
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<td>700,000</td>
<td>800,000</td>
<td>900,000</td>
<td>0</td>
</tr>
<tr>
<td>Promotion and marketing</td>
<td>350,000</td>
<td>350,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total Fixed Costs (Phase I)</td>
<td>2,285,000</td>
<td>2,285,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Total Fixed Cost (Phase II)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Total Fixed Cost (Phase II)</td>
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<td>2,285,000</td>
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<td>Total Fixed Cost (Phase I)</td>
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<td>2,285,000</td>
<td>0</td>
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<tr>
<td>Total Fixed Cost (Phase II)</td>
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<td>0</td>
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<tr>
<td>Total Cash Inflows</td>
<td>2,285,000</td>
<td>2,515,000</td>
<td>460,000</td>
<td>460,000</td>
<td>460,000</td>
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<td>460,000</td>
<td>460,000</td>
<td>460,000</td>
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<tr>
<td>Total Net</td>
<td>-2,285,000</td>
<td>-2,170,000</td>
<td>233,750</td>
<td>376,250</td>
<td>518,750</td>
<td>661,750</td>
<td>803,750</td>
<td>815,000</td>
<td>826,250</td>
<td>837,500</td>
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The above cash flow estimates were used as the basis for the Benefit/Cost analysis. Two scenarios were tested in this analysis for discounting both benefits and costs: 1) a commercial discount rate of 10 percent which reflects the current discount rate in the country and 2) a green or subsidized discount rate of 3 percent, since the main objective of the project is to protect the ecosystem in Bakoura. These assumptions are used to derive the three classical indicators (BC Ratio, Net Present Value, and the Internal Rate of Return).

### 5.3.1 The Net Present Value (NPV):

The NPV is the present value of the net cash flow or the present value of the inflow stream (benefits) minus the present value of outflow stream (cost), at a specific interest rate. The NPV can be interpreted as the present value of the income stream generated by the investment. The NPV for this project is:

- At 10% discount rate is JD 77,350
- At 3% discount rate is JD 6,240,484.

### 5.3.2 Benefit-Cost Ratio (BCR):

The BCR is the present value of the inflow stream (benefits) divided by the present value of outflow stream (costs), at a specific interest rate. One convenience of BCR is that it can be used directly to note how much cost could increase without the project becoming financially unattractive. The BCR of this project:

- At 10% discount rate is 1.008.
- At 3% discount rate is 1.354

Therefore, at a green discount rate, we can tell upon inspection that costs could rise by 35% before the benefit-cost ratio would be driven to 1.

### 5.3.3 Internal Rate of Return (IRR)

The Internal Rate of Return (IRR) is the discount rate which equates the net present value to zero. IRR is an important factor, which determines the financial validity of the project by determining when it exceeds the opportunity cost of capital. The opportunity cost of capital is normally the interest rate on borrowed capital available in the economy, at the time of the project implementation. The IRR of the Peace Park project is 10.2%, which exceeds the opportunity cost of capital borrowed at commercial rates as well as the green interest rate. This indicator shows that the project should be financially and economically feasible and attractive to the investor(s), especially if the investment costs are fully or partially subsidized/covered.
5.3.4 Sensitivity Analysis

The sensitivity analysis is usually conducted to assess a number of risks and uncertainties associated with both benefits and costs. These should be addressed in a constructive manner to ensure that the investing agency or the investor(s) is aware of all the implications before a final investment decision is taken.

According to the above indicators, especially at the green discount rate, it is expected that the project will perform well according to the expectations and the assumptions used. However, there is some uncertainty about the price variations, entrance fees, investment costs, operational costs and time of project implementation. The sensitivity analysis is performed for the following cases:

Case 1: Increasing Total Costs 10%
Case 2: Decreasing Total Benefits 10%.
Case 3: Decreasing Total Benefits 10% and Increasing Total Costs 10%

Table 14 shows that the three indicators performed well under the proposed scenarios. The NPV is still positive and the B/C is above one. The IRR is also above the green discount rate. The results indicate that the project is attractive and not sensitive to increasing total cost and decreasing benefits.

Table 24: Results of the Sensitivity Analysis Scenarios

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Case 1: Cost increase by 10%</th>
<th>Case 2: Revenue decrease by 10%</th>
<th>Case 3: Cost increase by 10% &amp; revenue decrease by 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV @ 3%</td>
<td>4,475,675</td>
<td>3,851,626</td>
<td>2,086,817</td>
</tr>
<tr>
<td>BCR @ 3%</td>
<td>1.231</td>
<td>1.218</td>
<td>1.107</td>
</tr>
<tr>
<td>Internal Rate of Return</td>
<td>7.88%</td>
<td>7.64%</td>
<td>5.38%</td>
</tr>
</tbody>
</table>

5.4 Conclusions

The above analysis has been conducted as part of a pre-feasibility study. Many of the estimates used to derive the financial indicators were built on certain assumptions based on other projects in Jordan and Israel. The results of the analysis of this pre-feasibility study, especially the Internal Rate of Return indicate that the project would be feasible.

Consequently, we can conclude that a full-fledged technical and economic feasibility study should be conducted that would cover all aspects of investments and should include a complete business plan. A comprehensive business plan should include all the
necessary steps for implementing the project including different plans such as a management plan, a marketing plan, a financing plan and a human resources plan.

6 Managerial/Organizational Feasibility

In designing integrated management initiatives for the operation of the Jordan River Peace Park, the following points should be taken into consideration:

- Initiation and support for management processes that bring together decision makers, users and local communities;
- Promotion of the development of management structures valuable to the wide variety of beneficiaries;
- Overcoming the constraints associated with institutional and political divides,
- Creating cohesion between local, national, and bilateral policies insofar as they relate to the proposed Peace Park and striving to ensure that they are recognized and efficiently applied;
- Changing the relationship between local communities adjacent to the proposed Peace Park;
- Building capacity at the State level in both countries for inter-disciplinary understanding of the role the Jordan River Peace Park can have at the national and regional level;
- Designating the area for conservation and development of eco-tourism activities;
- Creating conditions and mechanisms to share knowledge and experiences;
- Establishing a monitoring and evaluation system to inform decision makers and site managers

6.1 Principles of Integrated Management

The main aim of establishing the Peace Park is the conservation and sustainable development of the proposed area. As such the following multi-level principles should be applied:

**Biological**

- Adoption of an ecosystem approach, taking into account biodiversity and the structure of functioning habitats;
- Identification of efficient ways to benefit from biodiversity, through the effective use of biological resources, strategies for diversified resource management and use of appropriate technologies;
- Reduction of negative impacts on biodiversity;
- Increase of valuable natural resources and maintenance of existing biodiversity;
Social

- Respect for cultural and social contexts in choosing approaches that are appropriate to the local conditions and taking full account of local knowledge and traditional usages;
- Involvement of poor and/or marginalized groups, especially on the Jordanian side, in the development process;
- Encouragement of participation by all actors, through the development of partnerships between society at large, governments and the private sector, through the organizing of forums and scoping sessions;

Economic

- Encouraging the introduction of positive incentives and reducing market distortions that have an impact on biodiversity;
- Promoting access to the market for all social groups and fair commercial practices;
- Promoting the fair sharing of revenues and costs;
- Securing adequate funding over the long term

Political

- Promotion of cohesive linkages between bilateral, national and local levels, taking into consideration the commitments undertaken in the Peace Treaty,
- Promoting understanding of the areas shared ecological, historical and cultural heritage;
- Consideration of political, legal and institutional reforms that favor sustainable management;
- Respect and promotion of rights and customs as well as local methods using natural resources.

6.2 Context of the Jordan River Peace Park Initiative

There is an expressed need for economic development on both sides of the proposed Jordan River Peace Park. Economic development and diversification is particularly needed on the Jordanian side as noted earlier. In January 2007 the Mayors of the Jordan Valley Regional Council (Israel), Beit Shean Valley Regional Council (Israel) and Muaz Bin Jabal Municipality (Jordan) jointly endorsed a Memorandum of Understanding in support of the establishment of the Jordan River Peace Park to both foster restore pride of place to the river valley and create new opportunities for the local populations.

Friends of the Earth Middle East (FOEME) is primarily interested conserving the unique ecosystem in the area through cross border activities and the development of sustainable eco-tourism activities. The neighboring Jordanian stakeholders have indicated their support for the project particularly as it is predicted to create jobs and economic opportunities. Neighboring Israeli stakeholders have expressed their support for the
project and its ability to create cross-border linkages between the adjacent communities on both sides of the border.

In view of the factors mentioned above, it is crucial to determine the scale of multi-level management of the proposed area: ecosystem, economy, local society and politics:

- Developing partnerships with local communities adjacent to the proposed area
- Training, information dissemination, revitalization and management activities with residents from area communities
- Understanding the social and cultural values of the residents and promoting greater understanding of the shared values.
- Establishing economic systems related to local production, natural resource management and economic activities related to tourism, demography, urbanization, development, etc.
- Assessment of the political and administrative sphere is indispensable in understanding the policies which directly or indirectly affect the development of the area.

6.3 Identification of Key Stakeholders

A large variety of stakeholders should be involved in the development of the park at different phases. The key stakeholders should include:

- Ministries and authorities in charge of the management of the area and its resources;
- Local community leaders, activity groups and local advocacy groups;
- Landowners and owners of properties bordering the area;
- Users active in the areas adjacent to the Peace Park area;
- Private sector representatives
- Research organizations involved with sites or projects in the area or its surroundings.

Accordingly, the following stakeholders are identified:

- Friends of the Earth Middle East
- Muaz bin Jabal Municipality
- Beit Shean Valley Regional Council (Valley of Springs Regional Council)
- Jordan Valley Regional Council
- Ministry of Environment, Jordan;
- Ministry of Agriculture, Jordan;
- Jordan Valley Authority
- Ministry of Water and Irrigation, Jordan;
- Water Authority, Jordan;
- Ministry for Environmental Protection, Israel;
- Israeli Water Commission;
Establishment of the governing structure of the Jordan River Peace Park Project is represented in the Figure 40 below:

![Figure 40. Process of Establishing Governing Structure](image)

At the stage of the planning and establishment of the Jordan River Peace Park, the Temporary Pilot Group should be headed by Friends of the Earth Middle East due to their ability to bring together the various stakeholders and deep understanding of the proposed project.

FoEME will assume the leading role in the establishment of the Peace Park, coordination between stakeholders and management of the Park prior to the institutionalizing of the permanent governing body. The leadership role of a non-governmental organization in the establishment of a park is based on the successful precedent whereby RSCN was given a public service mandate to establish protected areas, to safeguard wildlife and scenic areas, to breed endangered species with the aim of saving them from extinction, to enforce government laws for the protection of wildlife, control illegal hunting, raise awareness of environmental issues through education programs, and promoting the sustainable use of natural resources in Jordan. FoEME also has significant experience in managing projects of this type as seen in the establishment of a eco-park in Tabkat Fahel Municipality.

The Steering Committee will be comprised of the Governor of Muaz Bin Jabal; the Mayor of Jordan Valley Regional Council; the Mayor of Beit Shean Regional Council
(Valley of Springs Regional Council); three representatives each from the Jordanian and Israeli local communities, two representatives from FoEME and representatives of other partners. The tasks of the Temporary Pilot Group and/or Steering Committee include:

- Making assessments and drafting proposals from the preceding phase (Pre-Feasibility Study);
- Further studies related to the ecological, social, economic, political development of the Jordan River Peace Park
- Making proposals regarding the resources, skills and networks to involve;
- Outlining the types of activities to be undertaken and supported

The third stage will focus on the establishment and legalization of the independent Administrative and Financial entity to govern the long-term sustainable development.

6.5 Governance of the Jordan River Peace Park
Governance of the proposed Peace Park should be based on an integrated management approach and a system of tasks, tools, products and anticipated results for the elaboration/execution of the management plan:

- Define the specific territories to be incorporated into the park;
- Define the top priority issues by a consensual agreement to serve as guidelines for further study and discussion;
- Draft the main guidelines of the action plan relevant to the various stakeholders and beneficiaries (national/local government, private/public etc.);
- Development a presentation of the overall goals and territory;
- Prioritized list of actions selected for the short and medium terms, and the identification of sources of funding;
- Develop monitoring and evaluation mechanisms;
- Identify institutional frameworks, funding sources, a time frame for achieving the goals and an outreach strategy.

![Figure 41. Preparation of the Management Plan](image-url)
6.6 SWOT Analysis

The SWOT analysis of the current situation of the proposed area and adjacent areas is presented in the table below:

<table>
<thead>
<tr>
<th>Jordanian Side</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• The biggest part of the proposed area for the Peace Park is located on the Jordanian side</td>
<td>• Inadequate local tourism infrastructure</td>
<td>• Increase and diversification of employment opportunities</td>
<td>• Low total gross income per capita</td>
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<td>• Relatively low level of pollution due to area's limited public access due to its status as a closed military zone.</td>
<td>• Limited economic and employment opportunities</td>
<td>• Willingness of local authorities to participate in the project</td>
<td>• Political instability</td>
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<td>• Lack of heavy industries in the region</td>
<td>• Insufficient infrastructure (roads, telecommunication, sewage, water, etc.)</td>
<td>• Cooperation with the Israeli side</td>
<td>• Resentment and unwillingness to cooperate with the Israeli side</td>
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<td>• Common culture and heritage</td>
<td>• Unregulated disposal of solid waste and water pollution from untreated effluent from villages;</td>
<td>• Possibilities for selling regional and local crafts and produce at the site</td>
<td>• Insufficient development strategies and vision for the development of the region</td>
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<td>• Traditional Food</td>
<td>• Insufficient NGO infrastructure</td>
<td>• Project could serve as a pilot site towards the rehabilitation of the full length of the Jordan River</td>
<td>• Increase in urban waste</td>
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<td>• High level of FOEME presence in the region</td>
<td>• Inadequate zoning by local municipalities</td>
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<td>• Resentment to changes to the way of living</td>
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Table 25: SWOT Analysis
The recommendations presented below deal with the establishment of the Peace Park. The process leading towards the official designation of the Jordan River Peace Park includes many forms of co-operation and co-ordination among the existing areas on either side of a border, which serve as a basis for formalizing the Peace Park.

### 6.7 Procedure for the establishment of the Jordan River Peace Park

In the first stage, the areas of the park will be declared protected areas by the relevant national authorities on both sides of the border. Eco-tourism focused development will

<table>
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<tr>
<th>Israeli Side</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
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<tbody>
<tr>
<td><strong>Strengths</strong></td>
<td><strong>Inadequate level of standards in hotel management and catering</strong></td>
<td><strong>Interest and willingness of local communities and authorities to establish park.</strong></td>
<td><strong>Orientation on cross-border (&quot;political&quot;) tourism rather than eco-tourism</strong></td>
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<td>Non-existence of heavy polluting industries in the area</td>
<td>Travel restrictions and difficulties for some nationalities to obtain travel permits/visas.</td>
<td>Education of youth and their active participation</td>
<td>Explicit focus on Israeli narrative associated with the history of the area without taking into account alternative narratives and understanding associated with the area's places and historical events.</td>
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<td>Previous experience in management of eco-tourism projects (Hula Lake)</td>
<td>Lack of information provided in languages other than Hebrew</td>
<td>Increase in tourist-related revenues due to the opportunity to visit the Jordanian side</td>
<td>Lack of integration and consultation of vision and strategies for development with the Jordanian side.</td>
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<td>Closeness and easy access to Lake Tiberias</td>
<td>Low levels of overnight stay in the communities adjacent to the Gesher and Naharyim sites.</td>
<td>Raising awareness of environmental values of the area</td>
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<td>Existence of qualified tourism and service related employees</td>
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<td>Existing capacities for further tourist development</td>
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<td>Well-developed tourist infrastructure</td>
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<tr>
<td>Well-developed infrastructure (roads, telecommunications, waste collection, sewage, water, etc.)</td>
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be initiated concurrently at the national levels within these reserves countries prior to the area being designated as a trans-boundary Peace Park.

The following procedure is recommended:

- Establishment of a National Park on the Jordanian side and a Tourist Park on the Israeli side in cooperation with the Israeli Nature and Parks Authority but administrated by the area kibbutzim.
- Local and national partners will be identified and a working group for co-operative activities will be established.
- Signing of an official agreement between the relevant governmental authorities in support of the establishment of the trans-boundary Peace Park.
- National authorities to nominate the relevant State authorities;
- Joint nomination for the whole area by the State authorities concerned.
- Development of the main components of a plan for future cooperation.

6.8 Functioning of the Jordan River Peace Park

Among the measures recommended to make the trans-boundary Jordan River Peace Park function effectively, priority should be given to:

- Preparation and adoption of a zoning plan for the whole area and implementation of zoning by strict protection of core areas, delimitation of the buffer zones and coordinated objectives for the transition areas; this implies that the countries concerned have a common understanding of the characteristics of each of the zones, and that similar management measures are in place for each zone.
- When the zoning plan is defined, a joint map of the zoning will be published.
- Definition of common objectives and measures, work plan, time table, and required budget; this should be a demand driven process, based on perceived needs or management requirements.
- Identification of potential funding sources for the work plan and joint or simultaneous application for these funds.
- Establishment of direct communication systems between the coordinators/managers.
- Efforts to harmonize management structures on both side.

6.9 Institutional mechanisms

The established joint coordination structure is recommended to include the following:

- Representative of various administrations and scientific boards as well as the authorities in charge of the protected areas, the representatives of local communities, NGOs, interested and affected groups, including youth and the private sector.
- This structure must have a permanent secretariat and an operational budget.
• A coordinator is designated on each side to act as a focal point for all cooperative activities.
• Regular meetings of the coordinating structure are complemented by thematic groups, on an ad hoc basis, in order to create a platform for discussion among stakeholders from both countries with a view to promote opportunities for exchanging views and knowledge.
• Joint staff teams are established to execute specific tasks.
• An association is set up with the specific aim of promoting the Peace Park.

6.10 Proposed Management Goals

6.10.1 Goal I: Use the Peace Park to Conserve Natural and Cultural Diversity

In order to develop a concerted strategy for conservation, the following measures can be recommended:

• Coordination and harmonization of regulatory measures related to the area’s cultural and natural heritage.
• Coordination and harmonization of policies related to threatened and protected species and ecosystems, migratory species, as well as control of invasive alien species.
• Coordination and harmonization of policies for the rehabilitation and restoration of degraded areas.
• Coordination and harmonization to prevent and respond to illegal activities.

6.10.2 Goal II: The Jordan River Peace Park as a Model for Sustainable Development and Land Management

The human component of the Peace Park and its role in promoting approaches to sustainable development can lead to a variety of forms of cooperation, ranging from the use of natural resources to the protection of cultural heritage.

Among the measures that can be recommended are the following:

• Coordination of management practices
• Elaboration and support for the implementation of a joint tourism policy.
• Promotion of partnership among various groups of stakeholders with shared interests.
• Local community participation (including NGOs).
• Promotion of joint cultural events and the fostering of cooperation related to shared cultural heritage and heritage preservation.
• Developing of common strategies for planning based on research and monitoring.

100
6.10.3 Goal III: Research, Monitoring, Education and Training

Joint research and monitoring activities should be planned and led by a board of scientific experts representative of all partner countries; these activities could be carried out using the following methodology:

- Define and implement joint research programmes.
- Develop common data collection formats, indicators, monitoring and evaluation methods.
- Exchange existing data, including maps and geographical information, and facilitate access to results of research.
- Share scientific information, through the organization of workshops, conferences and other activities.
- Share equipment when feasible.
- Jointly publish results of common research.
- Develop joint mapping and GIS.

An extensive programme of joint activities in the field of education and training are recommended including:

- Joint training courses and technical meetings for managers and field staff.
- Promotion of staff exchanges.
- Promotion of understanding of the neighboring country’s culture and the area's shared heritage
- Language training
- Academic exchanges to foster joint scientific research
- School exchanges
- Launching of participatory training programmes for various groups of stakeholders.

Information and public awareness are crucial to the development of a common understanding and to build support for the park's objectives from the different stakeholders. Therefore, the rationale and objectives of the Peace Park should be explained by varied means to different targets groups (decision makers, local populations, visitors, schools, scientists, managers, etc). Among other activities, the following can be recommended:

- Develop a common public relations strategy with the aim of raising awareness and promoting the Peace Park
- Produce information material including brochures, films, books, etc.
- Organize exhibits and events around the Peace Park.
- Develop a common logo as well as a common design for published material.
- Implement joint model projects.
- Set up a common internet site.
7  Security Plan

7.1  Access Control

Security departments are tasked with preventing all types of criminal activity within the park as well as threats to a particular border area. Central to this task is to control and monitor visitor circulation throughout the park.

While full control of visitor circulation is difficult to achieve without compromising visitor's enjoyment, ultimately the park's success is greatly linked to the security department's ability to provide a safe and secure area in an unobtrusive manner. To this aim the security mechanisms and personnel will be established including:

- Entrance is limited to the designated entrance/exit gates through which all traffic will be channeled and where visitor and vehicular registration and control can be maintained.
- Entrance/Exit Gates into/out of the Park will be equipped with computerized communication systems to enable security personnel to monitor the number and location of visitors throughout the park.

In the first stage all private vehicular traffic and visitors will be directed through a formal border control post and comply with standard border procedures. Security checkpoints will be installed at the entrance of the site, where people may be subject to video or other surveillance, without being aware of it. This is standard practice and legal requirement in most countries.

At a later stage, provided the security situation allows for it and all other requirements can be accommodated on both sides of the border, it will be possible to stretch the ‘corridor’ between two border posts, thereby allowing the Peace Park in effect to become the ‘corridor’. This will only be feasible or allowed in areas where entrance to the Park is completely closed and vehicles cannot move from one country to another except through formal border posts. This means that the entire Park area needs to restrict uncontrolled movement. A detailed investigation and a formal agreement must be established between all stakeholders of such an option.

Establishing peripheral border posts has considerable tourism advantages as it potentially reduces the border inconveniences for a large percentage of visitors who only want to access the Peace Park.

By mutual arrangement between the partner countries a visitor can be allowed entry into the Park from either country, travel anywhere within the entire Park (even those parts of the adjoining country) without going through the formal border procedures, as long as such a tourist exits back into the country of initial entry without having left the confines of the Park. This way the tourist has the full benefit of the entire Park without the procedural problems normally associated with border crossings.
However, if the tourist wishes to enter the Park from one country and after a stay exit into the next country, such a visitor has to go through the full border procedures upon entry into the Park and again upon exit. This is easy to control as a visitor will not be allowed exit into another country if border procedures were not complied with at the point of entry.

7.2 **Zoning of the Park**

To facilitate the process of negotiation for civilian access to the area, a zoning plan should be prepared in cooperation with the army forces currently in control of the area. The proposed zoning is as following:

- Free access zone in the vicinity and close proximity to the eco-lodges and Army Observation Platform;
- Buffer zone;
- Restricted access zone

7.2.1 **Surveillance in Different Zones**

Different types of surveillance will be applied in the proposed zones. The surveillance cameras should be positioned throughout the area with the monitoring center at the army headquarters.

**Free access zone:** Surveillance is provided through surveillance cameras with ad hoc supervision by rangers entrusted with the security of the area;

**Buffer zone:** Surveillance is provided through surveillance cameras and regular patrol by rangers;

**Restricted access zone:** Access to this area is strictly prohibited unless visitors are accompanied by the security personnel.

7.3 **Tourist Safety**

The park security authorities mandate should prioritize the safe and trouble-free tourism experience for the park visitors. The security and safety of park visitors will play a critical role in the long-term financial and political viability of the Park.

The proposed Jordan River Peace Park located in the border areas of Israel and Jordan, an area where violent conflict has occurred and where there is some measure of resentment and mistrust in the bordering communities. In earlier periods, military forces placed land-mines near roads or strategic areas to prevent or slow enemy movement, many of which remain in place today. These minefields are clearly marked and inaccessible to visitors however it is preferable to de-mine the entire area of the park and its environs to
ensure tourist safety. De-mining actions were undertaken at other border sites open to the public such as the baptism sites at Bethany Beyond the Jordan in Jordan and Kaser el Yehud near Jericho.

Figure 42. Warning Sign in Naharyim

7.4 Community Expectations
Border communities should be involved as critical stakeholders in a transparent manner from the beginning of the planning process to defuse information and manage expectations. Expectations unmet could have negative repercussions for the project's implementation such as resentment, reduced desire to be involved. The Jordanian experience at Dana Nature Reserve whereby local residents fought the establishment of the park illustrates the importance of involving local communities in park in a transparent and bottom-up method.

Communities should expect increased access to wildlife resources, increased interaction with community members from adjoining countries and new employment, trade and commercial opportunities.

7.5 Legal Matters

There is a need to coordinate and harmonize agreements, commitments and possibly legislation in order to streamline activities across national boundaries within the proposed Peace Park.

7.6 Management of Emergencies and Disasters

Despite the best practice of Park management and the best available infrastructure and equipment, accidents and unforeseen events do occur, and by their nature they usually represent some form of an emergency or crisis. In the event that a mishap does occur, it is essential that contingency plans and measures be in place to cope with such a situation.
While the ideal situation would be to have a permanent Emergency Control Center (ECC) where any crisis can be reported and which has the capacity to deal with most emergencies and can serve as an information and advice center, it might not be feasible to establish a permanent ECC.

A second option might be to designate a small number of appropriately skilled or qualified people to serve as an Emergency Management Team. These team members should be contactable at all times (by mobile phone or radio), they should know where to report during a crisis or emergency (a previously decided on central facility, fully equipped with telephones, radio, contact lists and other essential equipment). Each person will also have clearly defined tasks and responsibilities, and will be well versed in dealing with such tasks. It should also be required that such teams do/perform periodic mock emergency exercises of differing nature to sharpen their response skills.

There is a need to ensure that standardized and compatible equipment and procedures are agreed upon beforehand by partner countries to jointly deal with emergencies or handle an emergency on behalf of a neighboring country.

At least one member of the emergency team should be fluent in the language of the other country as well as English. Each country should have such an emergency team or at least emergency procedures in place to coordinate and advice during times of crisis.

7.7 Responsibility of Security Provision

Due to their long term presence in the area and detailed knowledge of topography and issues, the Army forces could be entrusted with the security provision in the area. Some of the revenues of the proposed tourist activity can be used to compensate the security service. Such issues should be negotiated with the Army forces for acceptance.

Security personnel should not only be effectively trained and equipped to deal with their specific security tasks, but also receive ongoing training to remain current within an environment where technology and societal needs and attitudes are in a constant state of change.

Security personnel should also be trained to recognize and operate within the special circumstance they find themselves in. Not only do they need to deal with safeguarding the interests of people, but also the security of the wildlife – both animals and plants.

Soldiers posted along the border area come from a very different background with a different mindset and sometimes yield to the temptation of engaging in illegal activities. Induction courses or training is required to strengthen awareness amongst security staff of the value and benefits of wildlife and the need for conservation of these natural resources. Furthermore, sensitivity needs to be created amongst security personnel regarding the nature and needs of tourism.
Tourists are on holiday and want to relax, not be confronted with weapon-bearing uniformed persons aggressively demanding identification documents, or columns of camouflage-clothed soldiers implying some kind of military emergency. Security staff needs to maintain a low profile, at least to the extent possible within the demands of their responsibilities. Conversely tourists gain confidence when there is a conspicuous and strong presence of security personnel, but all this needs to be done within the context of the particular conditions and prevailing situation. This balance of needs, and how to conduct themselves within specific situations, requires security personnel to undergo some extent of training or course attendance. To maintain an unobtrusive presence of security personnel it would be advisable to design some kind of “rangers” uniform.

7.8 Security Working Group/Committee

It should be the responsibility of the Security Working Group (SWG) to identify all the elements affecting security in the proposed Park, and to address all these issues so as to achieve – in a manner integrated with the inputs and products of other Working Groups - proper implementation and functioning of the Peace Park. Following the establishment of the SWG by the Technical Committee, the members of the SWG should elect a Chairman and commence activities.

For the effective functioning of the SWG it is necessary to establish channels of communication within the group, as well as communication with institutions entrusted with the national security of both countries.