

-
- Traditional human habitation and historical remains have been preserved.

The highlands wadis can be reasonably considered as a world natural heritage, and therefore as an invaluable resource for tourism and environment because of the high diversity of natural habitats and wildlife, the traditional villages and land uses (generally abandoned), their outstanding landscapes, and historical remains. Examples of highland wadis are those of Mujib, Dana-Finan, Shawbak, Zarqa Ma'in.

(2) Uniqueness of the Aqaba Gulf

Biological diversity of the Aqaba Gulf is quite unique in the world. The Gulf's habitat contains 127 species of corals, which supports a total of about 268 species of sub-tropical fishes. For comparison, the number of coral species is 116 in central Red Sea, 45 in Hawaii, and 15 in Bermuda's waters. The high endemism of the Gulf of Aqaba is also a unique feature.

(3) Uniqueness of the Azraq Oasis

The uniqueness of the Azraq Oasis is derived from the wetland habitat, which supports a rich diversity of migrating birds. The site has been classified as a Ramsar site, which indicates its international importance. However, by overpumping of the water resources, the site has been devastated since classified as a Ramsar wetland. rehabilitation scheme was initiated in 1994.

(4) Uniqueness of World Heritage Classified Sites

There are 2 cultural/archaeological sites designated in Jordan as "World Heritage Sites" by the Unesco committee: Petra and Qasr Amra. However, while nature tourism is a future potential for Petra, it is more limited in the case of Qasr Amra, which is surrounded by desert, with the Azraq oasis in its vicinity.

6.4.4 Areas of Natural Interest

As a result, the following areas are those that can be considered as areas of natural interest:

- Dead Sea with (South) Escarpment;
- Wadi Araba;
- Southern Highlands (with Dana, Petra);
- Hisma (with Wadi Ram);
- Azraq oasis;
- Burq/Badia;

- Gulf of Aqaba.

Table 6.4.1 Environmental Importance of Natural Areas

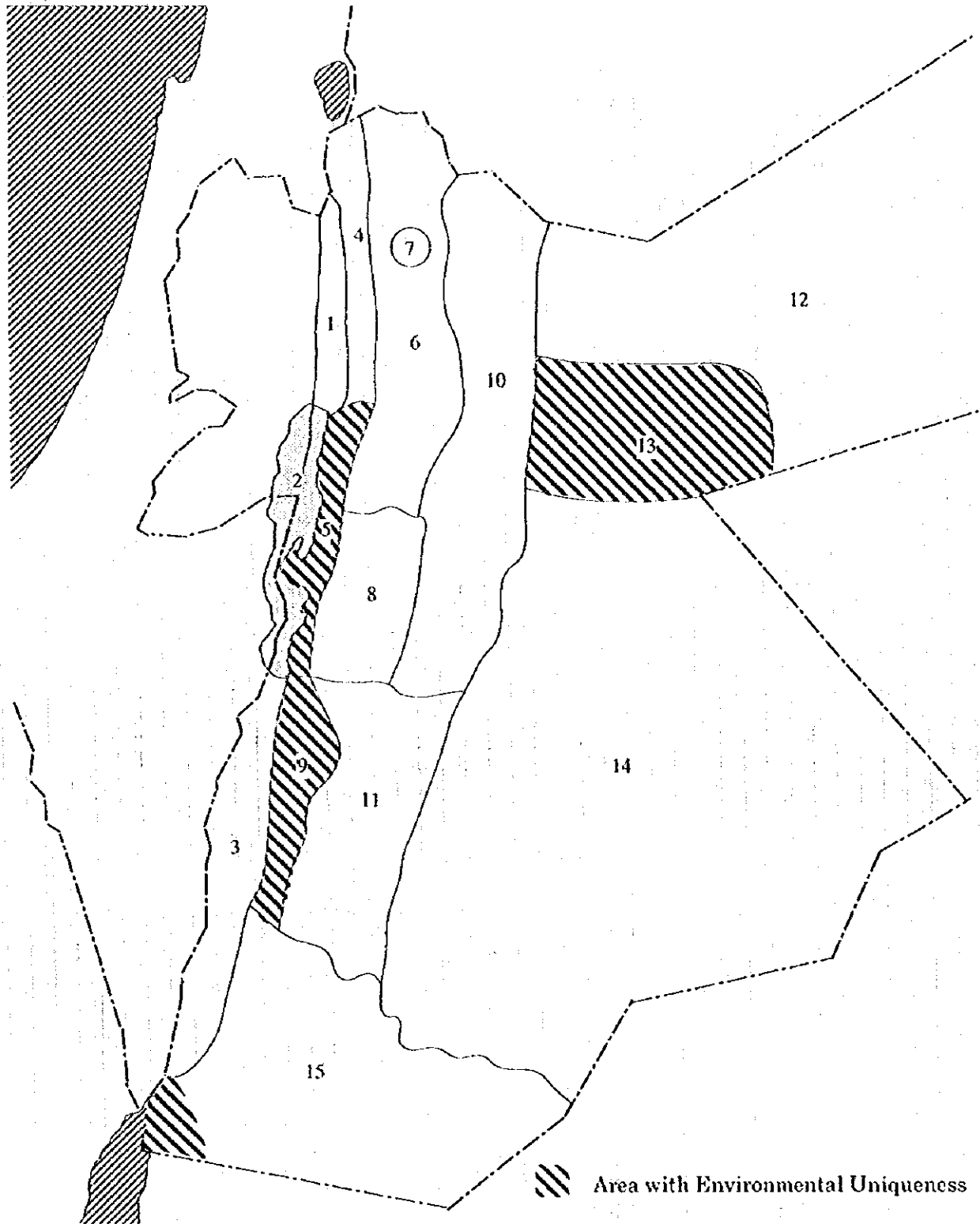
Area	Important mammals fauna (threatened/ endemic)	Important bird/wildlife areas	Established or proposed wildlife reserves	Important tourism sites
1. Jordan valley (Upper Ghor)	Bader, Marbled Pole Cat	Jordan valley (unprotected)	none	none
2. Dead Sea	Ibex, Hyrax, Hyaena, Badger, Porcupine	Wadi Mujib	Wadi Mujib (established)	Dead Sea shore; Ma'in spa
3. Wadi Araba	Wolf, Sand Cat, Caracal, Dorcas gazelle	Wadi Araba (unprotected)	Jebel Masadi (proposed) extension of Dana (proposed)	none
4. Northern escarpment	Caracal, Wolf, (Leopard?), Nubian Ibex, Mountain Gazelle, Striped Hyaena, Rock Hyrax	Yarmouk valley Dibbin Zubiya Hisban - Madaba plain	none	Umm Qays Pella
5. Southern escarpment	Mountain Gazelle, Nubian Ibex, Red Fox, Striped Hyaena, Wolf, Badger, Rock Hyrax, Porcupine	Wadi Mujib (reserve)	Wadi Mujib (established)	Ma'in Mukawir
6. Irbid Madaba	Persian Squirrel, Roe Deer reintroduced	Yarmouk valley (unprotected) Zubiya (reserve) Dibbin forest (national park)	Zubiya (established)	Amman Madaba
7. Ajlun Highlands	Red Fox, Wild Bear, Syrian Wolf	none	none	Jerash Dibbin forest Zai forest
8. Karak plateau	Ibex; Porcupine, Badger	Wadi Mujib (reserve)	Wadi Mujib (established) Abu Rukbah (proposed)	Karak

Table 6.4.1 Environmental Importance of Natural Areas

Area	Important mammals fauna (threatened/ endemic)	Important bird/wildlife areas	Established or proposed wildlife reserves	Important tourism sites
9. Southern Highlands	Wolf, Nubian Ibex, Mountain Gazelle, Sand Cat, Caracal	Wadi Dana - Finan (reserve) Petra	Dana (established) Jarba (proposed) Jebel Masadi (proposed) Petra national park (proposed)	Shawbak Petra Dana
10. Northern steppe	none	Zarqa: a) Khirba as Samra (unprotected) b) Qa Hanna (unprotected)	Abu Rukbah (proposed)	none
11. Southern steppe	none	none	Jarba (proposed)	none
12. Burqu Hammada/ Badia Plateau	Wolf, (Goitered Gazelle); Hyaena; Jerboa; Caracal; Hare	Burqu proposed reserve	Burqu (proposed) Wadi Rajil (proposed)	none, but project of biosphere reserve; Badia development project
13. Azraq oasis	none	Azraq oasis (reserve) Shawmar (reserve)	Wadi Rajil (proposed) Azraq oasis (reserve) Shawmar (reserve)	Azraq oasis desert castles. The area has been an ecological disaster due to overpumping of water; actually under rehabilitation
14. Bayir Hammada	Hyaena; Jerboa; Wolf; Caracal; Hare	none (but at the limit of Burq area)	Shawmar (reserve) Bayir (proposed)	none
15. Hisma	Sand cat, porcupine, Nubian Ibex, (Goitered Gazelle)	Hisma basin (proposed reserve) Aqaba Mountains (unprotected)	Hisma basin (proposed reserve)	Wadi Rum
16. Gulf of Aqaba	Species of Wadi Araba inland; biodiversity of marine wildlife	Aqaba Mountains (unprotected)	marine wildlife reserves (proposed)	Aqaba

Source: Birdlife International, RSCN, DOE

Figure 6.4.1 Location of Areas with Environmental Uniqueness, According to Natural Areas Units



Note : The numbers refer to those in Table 6.4.1.

6.5 Policies, Institutions and Legal Settings

6.5.1 National Environmental Strategy

The Department of the Environment (DOE) of the Ministry of Municipal and Rural Affairs and Environment (MMRAE) was established in 1980 in order to initiate planning of a National Environmental Strategy (NES), which was formulated in 1991. This was subsequently accepted by King Hussein and has been adopted by the DOE as the basis of all subsequent policy. The Higher Council for Science and Technology produced its own environmental policy document in the "Science and Technology Policies and Strategies." This document is understood to have no formal status and is not used by the DOE.

Forest policy is partly dictated by a policy document prepared in 1987 by the Forestry Department, but not officially enacted, and by the First Working Plan (1968-1978) for forest management. The WHO Regional Office for the Eastern Mediterranean has produced a regional Strategy for Health and Environment, in collaboration with member states.

NES is a "Resource Book of Information and Guidelines of Action", which contains a great number of recommendations. NES does not include specific chapters on the tourism sector. There are 5 strategic initiatives taken in NES:

- Legal framework for environment management;
- Institutional strengthening;
- Expanded role of protected areas;
- Bringing environment to the people; and
- Water and population issues.

Among the main institutional propositions are:

- Need of national environmental policy and sectoral plans;
- Need to expand legal and enforcement authority of DOE;
- Need of the EIA process, coordinated by DOE;
- Need to strengthen legal and financial, and to enhance technical capabilities of DOE; and
- Need to strengthen RSCN.

6.5.2 Environmental Laws

The Environment Protection Law of Jordan has been adopted by the Lower House of Parliament in 1995. It provides that the following bodies will be newly established:

-
- **General Environment Corporation (GEC)**, headed by a general manager. The actual DOE will be designated as the new GEC. Its objective is to carry out and implement a national environment policy, to prepare environmental standards, to control and follow up measurements, and also to set procedures and regulations for licensing of activities, for EIA of projects, and for establishment and supervision of natural reserves and national parks.
 - **High Council of the Environment Protection**, headed by the Minister and composed of 18 members, mostly general secretaries of ministers and NGO presidents. Its main responsibilities are setting of national policy and standards. Its decisions are implemented by the General Environment Corporation.

The environmental law provides general articles about environmental protection, and needs clarification through regulatory setting. As regards to the conservation of wildlife and nature, the law is not explicit. There is no any special article about this issue.

The legal framework for management of natural systems in Jordan is presented in Table 6.5.1.

6.5.3 Major Environmental Projects

(1) Review of Selected Environmental Projects

Recent or on-going environmental projects that are particularly significant for environment/tourism resources management have been selected, with a short summary of objectives, and indication of executing or funding agencies. The list of these projects is presented below:

- **Control of Natural Resources Degradation and Desertification in the Middle East (World Bank)**: This project, which still awaits final approval, addresses problems like control of arid land degradation, and improvement of management and conservation of natural resources. Among its components are rangeland and livestock management, and afforestation.
- **Gulf of Aqaba Environmental Action Plan (World Bank)**: This Action Plan will be the basic tool for protecting the Gulf of Aqaba's ecosystem, for identifying priority actions, and for addressing investment and institutional needs. The plan includes also the area of Wadi Ram. The plan also envisages the establishment of an EIA system, based on World Bank guidelines, under responsibility of the Aqaba Regional Authority Environment Unit.

- **Industrial Pollution Control (World Bank, with Japanese grant):** The project included several components, which are the design of a hazardous waste disposal facility, minimization of waste generated by industrial plants, industrial wastewater pre-treatment requirements, and soil/groundwater contamination from agrochemicals.
- **Strengthening Forest and Range Management (FAO and Forestry Department):** This project is a management plan for forests, reforestation of arid land and development of range land.
- **Arid Region Nature and Natural Resources Conservation and Rehabilitation - Azraq Component (UNDP/WB/GEF, DOE, MOA, MOW, RSCN, University of Jordan):** This project is described below as the Rehabilitation of Azraq Wetland Oasis Project.
- **Conservation of the Dana Wildlands, and Institutional Strengthening of the Royal Society for the Conservation of Nature (UNDP/WB/GEF, MOA, DOE, RSCN):** This project aims at the conservation of the Dana reserve wildlife, the establishment of a management plan, the sustainable use of local resources by local communities, and the training of the RSCN for future implementation of similar projects.
- **Aqaba Coastal Resources Environmental Management (EEC):** Among the recommendations of this project are the establishment of a regional environment authority in ARA, the establishment of an environment department in ARA, the setting of preliminary standards and regulations, including EIA requirement.
- **Water Quality Improvement and Conservation (USAID and MOW):** This project is designed to improve water management, to minimize water pollution, to improve irrigation water management, and water management education. The later is implemented by JES, which is launching training programs and public awareness.
- **National Agenda 21 (UNDP):** This project will set the agenda and priorities for action to promote sustainable development. Agenda 21 will identify projects of high priority, requirements for monitoring, information and data management, EIA and other environmental management systems, needs for legislative change and institutional strengthening, requirements for developing human resources.
- **The Badia Research and Development Program (Higher Council for science and Technology, and UK Royal Geographical Society):** This program aims at

sustainable development of the desertified Badia environment and the improvement of the standard of living of the inhabitants.

- Cultural and Environmental Resources Management (CERM; USAID, MOTA): This project aims at developing cultural sites and nature reserves. The project has 4 components: Enhancement of selected sites, development of tourist facilities, increased public awareness, and sustainable implementation of the project.
- Others, like the Petra National Park Management Plan (UNESCO), the National Biodiversity Country Study (UNEP), and the Regional Biodiversity Study (ICARDA).

(2) Azraq Oasis Conservation Project

The Azraq Project was initiated in 1994 by Prime Minister's declaration, with the aim of investigation and implementation of policies and activities needed for the restoration of the natural conditions of the Azraq Oasis.

The Project is composed of 5 sub-projects:

- Restoration and Management of the Azraq Wetlands Reserve;
- Establishment of an Environmental Assessment Unit and Implementation of the Ramsar Convention;
- Guidelines for Agricultural Development in the Azraq Basin;
- Studies on the water resources of the Azraq Basin;
- Long term Studies on Water Conservation and Management.

Implementation of the project has been made possible by coordination with jurisdictional agencies like MMRAE, MOA, RSCN, MOW, and University of Jordan, each of them being involved in one of the sub-projects. The Environmental Assessment Unit and Implementation of the Ramsar Convention Sub-project aims at the establishment of an EIA unit at the DOE. A project office has been established at DOE, and training of the staff will be performed for EIA and use of laboratory.

The Azraq Project institution has the following important non statutory responsibilities:

- The institution's responsibility covers the whole Azraq endoreic drainage basin, which has an area of about 12,000 km²;
- The institution performs studies on other wetland areas outside the Azraq basin;
- The institution is strongly involved in institutional building and public awareness, for protection and management of natural environment; and
- The institution supervises the implementation of the EIA process for the whole Azraq basin area. Although there is as yet no legal requirement for an EIA, each

new project in the Azraq basin is subject to such study for approval. The chairman of the steering committee of the Azraq Project, which is MMRAE, is also the chairman of the EIA sub-project unit.

6.5.4 Main Environmental Agencies

Protection of the environment is the responsibility of several agencies. Agencies that are more concerned with environmental protection are summarized below. The sectoral and institutional distribution of responsibilities and jurisdictions are outlined in Table 6.5.2 and Table 6.5.3.

(1) Central Government Agencies

Within the MMRAE, DOE is supposed to be the leading central agency, but has no legal power nor clear assignments for the role of the lead environmental agency in Jordan. The responsibilities of most of the sections overlap those of other existing in line ministries. The DOE has no any regional representation, but has a network of engineers within the Directorate of Municipal and Rural Affairs and the Environment (DNRAE), a companion department of the MMRAE. The DMRAE may provide information to the DOE on licensing or in response to complaints. DOE will be designated as GEC, but institutional responsibility is not yet completely clear. For example, involvement of this new agency in the EIA supervision and approval procedure for tourism projects is not defined. Decisions of DOE are never made independently. DOE's jurisdiction and enforcement power should be detailed in regulations according to the new environmental law.

Development and setting of environmental standards was a duty of the MOI. This has recently been just transferred (January 1995) to an independent new body, the Institution for Standards and Metrology. Only the MOH is given sufficient enforcement power and has the right to close down activities violating health laws. This right has already been used by DOE, MOA and MOH together.

(2) Institutional Specificities

The Jordanian institutional system has some interesting features:

- Higher Councils: These councils provide leadership and policy. They may be integrated into a particular ministry, and this is the proposition of the draft environmental law for the Higher Council for Environmental Protection; they may be independent, like the Higher Council for Science and Technology; or they may be formed from a number of ministries.

-
- NGOs may receive government funding and perform important administrative functions: This is the case for the Royal Society for the Conservation of Nature (RSCN), and the Royal Scientific Society (RSS);
 - NGOs may have a public service status, like the Jordan Environmental Society (JES);
 - There is a special governmental planning agency, the Aqaba Regional Authority (ARA), which receives regulatory jurisdictions;
 - There is a project unit, called Project Azraq and already mentioned, which performs administrative functions within a delimited area (Azraq basin), like licensing, and requirement and examination of EIA.

The Aqaba Regional Authority (ARA) was established in 1984 as a special governmental body for the social and economic development of the Aqaba region. This agency is responsible for monitoring and controlling all major construction activities, and carries out environmental monitoring with RSS. The Aqaba Regional Authority has jurisdictions for decisions related to land use planning.

(3) Major Environmental NGOs

The most active NGOs of Jordan in the field of environmental protection (RSCN, RSS, JES) are briefly described below.

a. Royal Society for Conservation of Nature (RSCN)

The Royal Society for Conservation of Nature was established as an NGO in 1966. The RSCN is composed of a 7-member board of directors, and is administered by a General Director. Its budget comes from public subsidies, and subscription fees (900 persons). The RSCN has received a mandate for enforcement of wildlife legislation, protection/management of nature reserves. These jurisdictions are performed on behalf of the Forestry Department. The RSCN's extended jurisdictions for wildlife conservation are:

- Managing of CITES and attribution of import/export licences;
- Attribution of hunting permits;
- Establishment and management of nature conservation reserves.

b. Royal Scientific Society (RSS)

The Royal Scientific Society is a national independent institution for research and industrial services. It is one of the scientific and technological centers of the Higher Council for Science and Technology. RSS is organized into several research centers, one of which is the Environmental Research Center. This center provides

studies, technical services and consultations, environmental monitoring, and training.

c. Jordan Environment Society (JES)

The Jordan Environment Society is an NGO with 2,000 members (and about 60 institutions/companies), organized into 16 local independent branches. The main activity of JES is actually environmental education and public awareness, through the National Environmental Information and Education Program, and the Water Awareness Program. General objectives are:

- to fight environmental pollution, particularly by the rapid application of standards and policies;
- to identify and mitigate local environmental problems; and
- to improve the level of environmental awareness.

6.5.5 Department of Environment (MMRAE)

(1) Organization

The Department of Environment is actually composed of the following sections:

- Nature conservation section;
- Water conservation section;
- Air conservation section;
- Land conservation section;
- Environmental services section;
- International cooperation;
- Strategy;
- Awareness and information (environmental education).

(2) Assignments

DOE was established in 1980 with the main objective of formulating the National Strategy for the Environment. The status of DOE has been specified in its Terms of Reference. The most important duty of DOE is implementing the National Environment Strategy, which has not been done until now. The main activities of DOE are licensing, control following from the public complaints, studies, and monitoring (sub-contracted to RSS). Since there is no formal coordination between environmental agencies, DOE's activities are still quite modest.

The Nature Conservation Section of DOE works on the following, in coordination with other relevant agencies (Forestry department, MOTA, municipalities):

- Formulation of policy for the protection of flora and fauna;

-
- Formulation of recommendations for upgrading environmental amenities of touristic sites (e.g., problem of collection of litter);
 - Studies of wildlife habitats and ecosystems, assessment of the geographical distribution of species and habitats;
 - Study for the establishment of the Burq biosphere reserve (UNESCO project; DOE is member of the study committee).

(3) Human Resources

Total staff at the DOE is about 20 to 25 persons in total, apparently distributed as follows: Nature conservation section (2), Water conservation section (2), Air conservation section (5), Land conservation section (2), Environmental services section (5), International cooperation (2), Strategy (1), Awareness and information (3). Accounting of staff is difficult because there is no clear staff assignments, and the sectoral distribution of staff in the DOE is in permanent change. In addition, it seems that the above mentioned numbers include a 4-person staff who are highly qualified and experienced but who are located outside DOE in Higher Council for Technology and Science, Jordan Environment Society, RSCN, and Ministry of Foreign Affairs. Since there is no coordination between DOE and these agencies, it seems that DOE's human resources management is defective.

(4) Future Development of DOE

DOE is a small department inside a big ministry, which was itself established for municipalities and rural affairs, and which received environmental functions at a later date. Its role as a leading environmental agency is made more difficult by the absence of environmental standards and lack of enforcement power. It is expected that enactment of the draft environmental law will establish a central environmental protection agency with clear jurisdictions and legal power. The proposed agency in the draft law is called the General Environmental Corporation. Duties of this Corporation would be as follows:

- Execution of the national environment strategy;
- Setting of programs, and EIA;
- Issuing rules and regulations; preparation of environmental standards;
- Coordination between development and environment;
- Control and inspection.

6.5.6 Forestry Department (MOA)

(1) Organization

The Forestry Department is responsible for the management of forest and range land, and for soil conservation and protection. This department is organized into 7 technical divisions. The country has been divided into 19 Agriculture Directorates, with a Forestry section in each. Forestry section is however not directly linked, administratively or financially, with the Director of the Forestry Department of MOA. Each Forestry section is supervised by the Agriculture Directorate, which reports to the Minister before coming down to the Forestry Department.

(2) Assignments

The Forestry Department has an important role in environmental protection for the following reasons:

- Given the high priority of water and soil conservation objectives in Jordan, management of forest and range lands is primarily dealing with protection and afforestation issues. Objectives of forestry are then to secure environmental benefits, and to provide amenities for the people. Revenues provided by this sector are almost limited to those of licensing fees, fines, sale of forestry products, and rent of forest land.
- The forestry agency has an integrated approach including habitat and wildlife. Protection of wildlife is however delegated to an NGO, the RSCN.

6.5.7 Permitting System

(1) Environmental Permit

Given the lack of environmental standards and the lack of clarity in statutory mandates and institutional responsibilities, permitting for compliance with environmental requirements is deficient and not organized. There are no specified formal procedures. In the field of water and sewerage, any work is subject to approval by MOW. In the field of air pollution and soil/groundwater contamination, there is no clear permitting procedure.

Basically, each new activity, being agricultural, industrial, or urban/public works, is subject to approval by MOI or DOE, after consultation with licensing committees. Activities lying in pre-defined industrial zones are permitted by the MOI (Investment Department), through a licensing committee with no fixed membership. Activities of quarrying and mining are permitted by the NRA, through a committee whose members are generally DOE, MOA, NRA, and the relevant municipalities.

Activities lying outside industrial zones are permitted by DOB, after consultation within a licensing committee composed of the following agencies: MOW, MOH, MOA, MOPW, NRA, and DOE. Criteria taken into consideration by DOE for approval of license are not formally defined, and refer to the substances used, discharge and disposal of waste, pollutants emissions, and geographical location. Recommendations of the licensing committees are based on general informations, visits to the site, and exchange of views. The problem of licensing committees is that recommendation for approval is determined by the composition of the committee. Important projects with environmental impacts can be easily permitted if DOE is not included as a member of the licensing committee.

(2) Environmental Impact Assessment

EIA is not required by law, even after the new environment law, which is not clear about this issue. An EIA is however unformally required for international investment projects, ARA projects, and projects lying within the "jurisdiction" of the Azraq Project. In the later case, there are 3 reasons for such a requirement:

- Azraq is a case of wetland of international value, which has been neglected until it became an environmental disaster. Rehabilitation and careful management would not be possible without appropriate permitting system, including EIA.
- The Azraq Project plays the role of pilot study area for application of EIA in Jordan
- The Azraq Project is supported by international aid, which requires an EIA procedure.

(3) Permits Supervised by the Forestry Department

The Forestry Department is the responsible agency for the following permits:

- Hunting permits;
- Grazing permits; and
- Permits for cutting of trees.

Hunting activity is regulated by the MOA, but legal enforcement has been delegated to the RSCN. Other permits, which are directly managed by the Forestry Department, lack enforcement rules. RSCN delivers hunting permits, and return the collected fees to the Forestry Department. Hunting is managed according to the following:

- Division of the country into 6 hunting areas;
- Close-season and permitted hunting frequencies;
- Limited number of catches; and
- Payment of a hunting fee.

Table 6.5.1 Legal Framework for Management of Natural Systems

	Laws	Comments
Water	<ol style="list-style-type: none"> 1. Military Ordinance N°6/1980 2. Water authority Law N°18/1988 3. Regulation N°202 wastewater limits 4. Regulation N°286 (Drinking water quality standards) 	Military ordinance makes obligation to industry to treat wastewater; no technology or effluent limits. Water authority Law set rules for water uses and water quality standards according to use purposes
Air quality	<p>There is no legal requirements for the control of air pollution emissions and for ambient air quality standard. Air quality related laws are:</p> <ol style="list-style-type: none"> 1. Public Health Law N°21/1976 2. Traffic Law N°14/1984 3. Dust (Aqaba) 	Public Health law is general and deals with environmental nuisance; Traffic law prohibits the driving of polluting vehicles, but this requirement is not clear and has no any implementation
Soil	<ol style="list-style-type: none"> 1. No law regulating waste disposal 2. Agriculture Law N°20/1973 	2. Regulation of use of agro-chemicals, and soil conservation
Coastal zone	<ol style="list-style-type: none"> 1. Aqaba Region Authority Law N°7/1987 2. Aqaba Port Services Fee Law N°44/1976; 3. Shipping Law; 4. Agriculture Law N°20/1973; 5. Water Authority Law N°18/1988; 6. Regulation N°202 	Aqaba Region Authority has responsibility for coastal zone management (see Aqaba Environmental Action Plan); Control of marine pollution from shipping; control of fishing activity/ fishing location; control of industrial discharge to marine water
Desert zone	Agriculture Law N°20/1973 for soil conservation, plant protection, and hunting restrictions	Grazing land is defined as land with less than 200mm rain/year; MOA has right to issue regulations to develop/ protect these lands
Forest area	Agriculture Law N°20/1973 is the basic law for management of forestry and forest protection	Forestry legislation lacks provisions like management plans, EIA, inventory, etc. The First Working Plan of 1969-1978 has set the basis for the forestry policy. A certain number of historical trees are protected on the basis of this Working Plan.
Landscape	none	There is still no law for the integrated protection of natural and cultural properties; However, the afforestation policy of the Forestry Department is clearly a component of landscape quality improvement

Source: DOE, PRIDE project (USAID)

Table 6.5.2 Sectoral Distribution of Environmental Management Responsibilities

	Line ministries	Other agencies
Water quality	<u>Water Authority of Jordan (MWI)</u> : provision of drinking water, construction and maintenance of municipal wastewater treatment plants in Jordan; monitoring of industrial effluents; <u>Jordan Valley Authority (MWI)</u> : irrigation water issues in Jordan valley up to 500m elevation. <u>Department of Standards and Specifications (MIT)</u> : has set wastewater regulation N°202 and drinking water quality regulation N°286. <u>Department of Health (MOH)</u> : monitoring of water supply and health effects of wastewater discharge; <u>DOE (MMRAE)</u> : responds to complaints, monitors water quality, and conduct studies	<u>RSS</u> performs water quality monitoring and studies on behalf of DOE (MMRAE); <u>RSCN</u> makes sampling and analysis of marine water quality (Gulf of Aqaba)
Air quality	DOE (MMRAE); Environmental Health Division (MOH); Occupational Safety and Health Institute (Ministry of Labor); Ministry of Transport	DOE subcontracts to RSS; RSS is establishing an air quality monitoring network for Amman; University of Jordan
Soil quality	Ministry of Agriculture; DOE for waste disposal; Natural Resources Authority; Water Authority	
Erosion Desertification	Forestry Department (MOA); and DOE engaged in desertification problem	Jordanian Society for Desertification Control and Rural development, with DOE; RSCN (awareness programs); Universities
Noise/foul odor	DOE (MMRAE); Environmental Health Division (MOH); Occupational Safety and Health Institute (Ministry of Labor)	RSS; JES
Flora and fauna Natural habitats	MOA (Forest and soil conservation Dpt) is in charge of protection, conservation and management of wildlife; coordination with DOE	MOA has delegated jurisdiction to RSCN; Azraq Project
Landscape	Forestry Department is certainly the agency the most directly involved in landscape protection/restoration, through conservation of natural habitats and afforestation projects; coordination with DOE	RSCN for protection and management of nature reserves
Environmental education	Ministry of Education, in relation with JES; information campaigns by DOE, MOW, Forestry Department, MOH	Jordan Environmental Society is particularly active as NGO with public service status in the field of public awareness, information campaigns, and education/training.

Source: DOE, PRIDE project (USAID)

Table 6.5.3 Institutional Distribution of Main Environmental Jurisdictions

	Country level (line ministries)	Regional level (governorates; ARA)	City level (municipalities)
Policy setting	DOE: National strategy for environment (transcribed in the draft law); Higher Council for Science and Technology for development of sectoral policies including environment (see Badia development Program); Line ministries; JES is an NGO which develops information and education programs (public service status)	ARA Azraq Project	Greater Amman: Comprehensive Plan (until 2005)
Setting of regulation / criteria	Normative emission standards have been established by the Department of Standards and Specification (MOI); they are established by the Institution for Standards and Metrology since January 1995; this institution is directly linked to Prime Minister, and is constituted of a board of 15 members	none	none
Permitting	Licenses for industry/public works projects are delivered by DOE for activities outside defined industrial zones and outside Greater Amman or ARA. MOI delivers licenses for activities inside industrial zones. There is no EIA, but licensing decision is supported by recommendation of licensing committees; Licenses for mining and quarrying are delivered by the Natural Resources Authority; Hunting permits delivered by RSCN; Forest Department delivers permits for cutting of trees, and for grazing in forest	ARA and Azraq Project are requiring EIA studies for approval of new activities; ARA delivers licenses for conformity with land use plan	Urban planning, collection and disposal of waste; Greater Amman: for licensing of food distribution and activities; no EIA required
Monitoring / sampling and analysis	DOE has launched a monitoring program for water and air, implemented by RSS; MOW for water; MOH for drinking water, for industrial emissions; MOA (Pesticide Residue Analysis Laboratory); Natural Resources Authority monitors mines and quarries; Jordan Universities; RSCN makes surveys of wildlife on behalf of MOA	Azraq Project in the Azraq Basin; ARA in the Gulf of Aqaba region	Greater Amman makes direct sampling and analysis of drinking water (20 samples/ week)
Control / inspection	By line ministries; DOE makes inspections in response to complaints from people	Azraq Project in the Azraq Basin; Agriculture Directorate	Greater Amman for food quality and for urban cleansing (including waste disposal)

Source: DOE, PRIDE project (USAID), Azraq Project, Forestry Department

6.6 Current Problems and Issues

This section is dealing with existing problems of ecological, institutional and legislative nature. Institutional and legislative shortcomings of the environmental protection system are not specific to tourism projects, but they hinder sustainable tourism development. Such problems and issues are reviewed below.

6.6.1 Institutional and Legal Issues

The new environmental law has been enacted. However, distribution of responsibilities for environmental management still remains unclear. Basically, each ministry takes some responsibility in pollution control, implementing its own monitoring and management programs, and creating overlapping or conflicting actions. As a result, the industrial sector has been reluctant to deal with pollution. It is estimated that the setting of standards, regulations and guidelines for implementation of the environmental law will require a further 5 years to develop, if not supported by international aid. The main problem with institutional and legal issues is the setting of priorities and the method of rapid implementation.

In the tourism sector, it is urgent to define sectoral guidelines for EIA, to define appropriate sustainability concepts, to evaluate institutional priorities for integration of tourism with nature (e.g., national park), in coordination with relevant agencies (GEC, Forestry department). A section responsible for environmental issues has been established at MOTA (1994), but has no statutory Terms of Reference, and employs only 1 person.

The following problems should certainly be addressed as a priority:

- Overlap in responsibilities;
- Unclear distribution of responsibilities;
- Gaps in environmental protection;
- Absence of a budget and staff resources for enforcing laws;
- Absence of clear procedure for environmental permit;
- Absence of EIA requirement;
- Lack of legislation for environmentally sound management of waste, for control of air pollution;
- Absence of environmental ambient standards for air, water, soil; lack of environmental criteria/guidelines for industrial activities and solid waste disposal sites; and
- Absence of specific law for the protection of natural habitats, like reserves or national parks for conservation of nature.

6.6.2 Issues Dealing with Nature Conservation

- There is no official land use planning or zoning regulation. The absence of land use planning and zoning of development, protection and conservation areas for environmental management has led to disorganized and uncontrolled tourism development. Without such legislative framework, integrated management of tourism sites and protection of nature tourism resources will be difficult.
- There is no legal framework for the establishment and management of protected areas. Wildlife reserves are decreed individually by royal proclamation, and established under the administration of RSCN. Tribal laws usually conflict with official RSCN policy and conservation of wildlife. Present wildlife protection laws should be revised and incorporated into new regulations under the new environmental law.
- Gazetting of protected areas should follow the guidelines set by the IUCN Commission of National Parks and Protected Areas for the creation of protected areas, and with specification of the legal status of each protected area category.

6.6.3 Issues Dealing with Sustainable Tourism

- Lack of integrated management of the tourism site with surroundings. Integration of the local host communities is also lacking. Integration of landscape protection with tourism sites, and integration of nature with culture in tourism sites are prerequisites for sustainable tourism development.
- EIA has never been applied for tourism projects in Jordan, and is generally not required for domestic projects. However, within the context of very weak institutional and legislative system for the protection of nature, EIA is an essential method to sustain the quality of sites.
- Lack of control of the tourism activity as regards to the visitors circuits, traffic density, sites frequentation, environmentally friendly behavior, and supporting basic services.
- Lack of environmental awareness (illegal hunting and fishing, spreading of litter and plastic materials, absence of EIA of tourism projects).

6.6.4 Main Issues and Recommendations

- Several environmental issues directly affect the tourism resource: Desertification, loss of biodiversity, social disruption, degradation of landscape. Tourism development will depend on the conservation of natural/cultural resources. Environmental quality is a resource for tourism, and tourism can provide benefits for the conservation and upgrading of the environment.

-
- Because of its limited size and the sensitivity of environment, Jordan has limited carrying capacity for tourism development. It is essential to take into account this constraint of carrying capacity when developing sustainable tourism.
 - The legislation for protecting the natural environment is very weak. The basic law is the hunting law. There are several agencies involved in environmental protection, including DOE, Forestry Department, RSCN, and MOTA. However, the only agency which is able to implement protection of nature is an NGO, the RSCN. There is an urgent need to carry out nature protection laws, and to define appropriate institutions (national/regional parks, nature reserves).
 - Natural sites are not managed in a sustainable way because of several deficiencies like the absence of nature protection regulations and enforcement agencies, the lack of human and financial resources, and the weakness to carry out land use policies and plans.
 - In the absence of legislation, multimangement of tourism sites seems to be a realistic alternative. RSCN is already gaining experience in the development of ecotourism (Dana reserve). The coordination of MOTA with this agency, and those already mentioned above, seems essential for appropriate development.
 - However, coordination should be improved. Dibbin forest national park is an example of the lack of coordination: Forest site (Forestry Department) and visitors facility (MOTA, delegated to private management) are the components of the amenity. Litter is widely scattered in the forest. This is largely due to the lack of appropriate coordination between forest resource maintenance and tourist activity management. This kind of situation provides a disamenity.
 - MOTA has already developed the Terms of Reference for EIA of tourism projects. Together with EIA guidelines in the tourism sector, this TOR should receive the agreement of the General Environment Corporation. MOTA must take measures to make sure that EIA of projects is implemented according to this TOR and eventually guidelines. The General Environment Corporation should be the supervising agency of EIA studies.
 - MOTA has not been registered as a member of the High Council of the Environment Protection. The absence of MOTA from this council should be rectified urgently, since tourism development cannot be considered without strong environmental conservation and protection. The environment unit of MOTA should be strengthened (Terms of Reference, staff), and should immediately commence work on ecotourism policy and promotion in relation with tourism development projects.

- Other important aspects are landscape resource development (protection and management of landscape in coordination with antiquity sites, landscaping of accesses), and promotion of eco-products.

6.7 Environment Management Guidelines for Tourism Development

6.7.1 Objectives

Sustainable development of tourism means:

- Natural resources protection (water, soil, air);
- Tourism resources protection (diversity of culture and nature, landscape);
- Protection of the resource base for local communities; and
- Acceptability of tourism by local communities.

The objectives of the resource/environment protection strategy as regards to the tourism sector are:

- Sustainable development of nature tourism potential areas;
- Restoration and improvement of existing tourism sites; and
- Development of ecotourism.

(1) Conservation of the Natural and Cultural Heritage

The natural and cultural heritage must be preserved in order to save the physical factors of nature tourism potential as described in Section 6.3. Integrated management of nature and culture at existing sites has not been taken into account in present tourism, which is a factor of degradation of the tourism resource. Most important objectives are described below.

- Protection of water resources and water conservation measures;
- Protection of landscapes around core areas, by designation of nature conservation zones, EIA of facilities on landscape issues, land use control, and integration of antiquities;
- Protection or rehabilitation of wildlife;
- Designation of important zones or areas in terms of wildlife, geology, antiquities, traditional know-how; and
- Conservation of old villages and traditional cultures.

(2) Identification and Development of the Nature Tourism Potential

Advantages of nature tourism are tourism products diversification, and environmental protection. Presently, there could be no justification to develop such potential because there is no clear demand. However, it is better to consider nature tourism alternatives into tourism development for long term purposes. Objectives are:

- To provide "buffer zones" between cultural/archeological attractive sites;

- To ensure long term preservation of natural resources, specially wildlife and landscape; and
- To increase the capacity to deal with the future expanding demand for nature tourism.

Then, the following objectives should be given priority:

- Identify the nature tourism potential: Identification should be based on environmental factors, as done in this study, and include as well socio-economic factors, particularly to adjust with the changing needs of tourism in time;
- Protect the nature tourism potential as a patrimony for the future: Nature tourism potential takes into account historical and cultural sites (integrated management need); protection involves the action of nature conservation agencies; and
- Develop the potential in the future according to opportunities like institutional and financial capacity, and socio-economic demand.

(3) Development of Sustainable Tourism

The long term conservation of nature as a tourism resource is largely determined by appropriate integration of tourism in the natural and social environment. Such integration will be possible if the following objectives are reached:

- Initiate and develop opportunities to promote environmental awareness and responsibility of people;
- Create job opportunities for local people who generally have no special skills;
- Improve the living conditions of local people especially women;
- Substitute environmentally friendly activities to those which are conflicting with the protection of the tourism resources;
- Improve the quality of tourism sites and surrounding environment, and resolve the environmental problems currently raised by tourism development;
- Develop the financial capacity of environmental management and reserve a minimum percentage of tourism investment to landscape conservation and quality enhancement of the site; and
- Harmonize international tourism with local domestic tourism to avoid conflicts and to increase social acceptability.

6.7.2 Measures

Main measures to meet the defined objectives are described below, with a summary in Table 6.7.1.

(1) Conservation of the Natural Heritage

Siting of facilities, design, integration into the natural and cultural environment, management of the input/output materials, and land use planning are necessary measures. Main measures are proposed below, but measures for sustainable tourism are also relevant here, in most cases.

- Need to upgrade current wildlife legislation, and to define the list of endangered species; formulation of a law for the creation and management of protected areas;
- Regulatory and institutional building for conservation of landscape and nature: This includes development of the EIA of projects, the official designation of protected areas like nature conservation areas and nature parks, and environmental planning at regional level.
- Designation of natural parks (national or regional) for areas of national/international interest. Wadi Ram and Dead Sea should be considered in priority. Environmental planning is needed for defined important nature tourism areas.
- Conservation, restoration and development of environment as a tourism resource, and designation of sites of interest as natural patrimony;
- Financial and technical aid to leading environmental NGOs like RSCN and JES;
- Research programs on wildlife and rural society;
- Development of tourist awareness about nature environment and culture; development of sensitivity and responsibility;
- Comprehensive planning; involvement of tourism development actors, host community, environmental agencies; Land use plans and environmental plans at regional level are however a prerequisite for such planning;
- Clear marking of spatial limits of nature reserves.

(2) Identification and Development of the Nature Tourism Potential

- Coordination with nature conservation agencies (GEC and RSCN), and with agencies like ARA and JVA;
- Wildlife surveys to identify the ecological value;
- Social surveys to identify the land use pattern and its effects on nature;
- Priorities for nature conservation, with ecological zoning;
- Discussion with local communities to find out needs and acceptability of tourism;
- Establishment of land use plan, with ecotourism development zones, and
- Development of control and monitoring systems.

(3) Development of Sustainable Tourism

In the absence of clear regulation as regards to wildlife and landscape, the protection of the nature tourism resource base is a difficult task. MOTA should

carry out a policy to promote and develop the ecotourism sector within tourism projects. The view of using tourism development for nature conservation must be developed in coordination with nature conservation agencies. Such coordination should reach consensus and be officially defined in guidelines about nature tourism.

Development of sustainable tourism is based on measures like:

- Programs of rehabilitation and development of existing sites to get sustainability levels; Project units should be designated within the MOTA for each important project site in order to develop integrated management with other agencies;
- EIA of tourism project, with mitigating measures, and consideration of nature and culture; the examination and approval process of EIA should be clarified and involve the General Environment Corporation as the supervising agency; regional EIA guidelines and ecotourism guidelines should be carried out;
- Coordination with RSCN in order to define appropriate nature conservation zoning, land use priorities, nature tourism development plans;
- Collection of entrance fees in designated sites, creation of job opportunities in relation with ecotourism development;
- Sensibilization campaigns and exhibitions to environmental problems;
- Development of environmentally friendly facilities and products (waste reduction, recycling, water and energy conservation, avoidance of litter, use of local products);
- Need to develop information and monitor progress and problems of the projects; measurement of the social, cultural, economic, and ecological impacts of tourism development.

6.7.3 Priority Actions

(1) Protection and Conservation of Natural Areas

The protection of natural resources, which could be the resource base for local communities in some cases, is an essential condition of sustainable tourism. Protection tools are basically land use planning, regional environmental planning, EIA, involvement of local population, and designation of nature conservation areas. However, regulatory development and institutional enforcement is a prerequisite.

Wadi Rant, Petra, and Dead Sea are top priorities for the protection of nature and landscape, and possible designation of natural parks. For the existing nature conservation sites, it is urgent to implement a system of physical marking of the limits of the reserves, clearly understood by people.

(2) Restoration and Integrated Management of Existing Sites

As measures for cleansing and restoration of tourism sites (Wadi Ram, Zara near Dead Sea, Petra, and others), several types of actions are needed:

- Additional facilities for enhancing salubrity conditions and for satisfying the needs of visitors;
- Land use plan in order to control the development of the site and the quality of its resources;
- Coordination with local communities to avoid possible conflicts and to develop benefits for them; coordination between international visitors and picnickers is also an essential issue;
- Integration of nature (wildlife, landscape) and culture (villages, people) into sites that have been valued for archaeology only in most cases; integration is possible by zoning and planning, by development of nature-oriented facilities like trails, by accesses and physical links between elements of sites.

(3) Wildlife and Social Surveys

The task of substituting sustainable activities to non sustainable ones in the context of tourism development projects needs a program of investigating the needs of communities and the conditions for acceptability of tourism, together with the need to protect the tourism resource base. For that purpose, carrying out social surveys would permit the understanding to the problems of conflicting uses of land and non sustainability of traditional activities like grazing, and to propose solutions for linking nature protection management with tourism development and with local communities. Wildlife surveys should be more systematically performed in view of determining nature conservation priorities and as a source base for land use and environmental planning.

(4) Involvement of Local Communities and Women

A good balance between tourism, wildlife, and communities is the first condition of sustainability. Overgrazing and hunting by bedouins are some important factors of elimination of wildlife. Desertification of villages is also an important cause of degradation of landscape and loss of traditional culture. However, these populations and settlements are a valuable cultural heritage for tourism development. Tourism should provide a substitute to grazing activity and to poverty sources, through employment or role in tourism (guide, accommodation in bedouin camp and in villages). Apart from economical advantages and increased acceptability of tourism, benefits would be a minimized pressure on wildlife, and provide new valuable tourism resources (cultural, natural).

(5) Technical and Financial Aid to Leading Environmental NGOs

RSCN and JES are actually engaged in nature conservation and environmental education respectively. This activity is important in connection with sustainable tourism and quality of tourism, and should be encouraged by MOTA. Technical and financial assistance in these fields would be fruitful, and should be considered within the multi-lateral or bilateral aid programs.

(6) Environmental Education Programs

Tourism can be used as a method to increase environmental awareness among visitors, through exhibitions at museums or through the organization of ecological trails on wildlife for example. Such trails could be organized about a subject like historical evolution of wildlife, based on field observation, visit of museums, visit of historical paints or mosaics representing wildlife. This subject is covering issues like statements, understanding of extinction of species, efforts to reintroduce species, and need of conservation. Such trail would reach the objective of sensibilization to wildlife, reserves, and environment.

6.7.4 Priority Areas

(1) Objectives

Priority areas are those areas that are receiving priority in terms of natural heritage for the development of tourism. They are important for wildlife and biodiversity resources, natural habitats, and landscape resources. Identification has been made according to the natural areas of Jordan. This evaluation is a first step in the identification of the nature tourism potential.

(2) Method of Evaluation

Priority areas are identified for the areas of natural interest and for existing tourism sites, mainly according to the sensitivity factor (areas with environmental threat), and secondarily according to the existence of tourism site or project. Areas of natural interest are those of ecological importance and/or those with environmental uniqueness. Areas with environmental uniqueness are the following:

- Highlands wadi;
- Gulf of Aqaba;
- Azraq oasis; and
- World heritage classified sites (Petra, Qasr Amra).

As regards to the sensitivity factor, the following ranking is adopted, with increasing priority order:

- Sensitive zone: No pressure neither degradation, but sensitive to future change;
- Critical zone: With pressure and light degradation;
- Highly critical zone: With pressure and severe degradation.

The evaluation of priorities is possible by making a correlation between areas are important in terms of environment/tourism resources (areas of natural interest), and areas that are in a sensitive, critical or highly critical state of degradation (Table 6.7.2). The assumption is that tourism can provide benefits for conservation or upgrading of the environment, while environmental quality is the resource of tourism activity. Then, top priorities are those areas that are potential tourism resources by the uniqueness or importance of their environmental resources, but are in a critical or highly critical state of degradation.

(3) Priority Areas

Priority areas are directly given by the above table. The first priorities are critical areas and include the following: Azraq oasis, Dead Sea with escarpment, Wadi Ram, and Aqaba. The second priorities are sensitive areas, namely Wadi Araba, Southern Highlands, and Burq/Badia.

A priority zone is defined as the geographical set of priority areas with areas having environmental uniqueness. From the above consideration, it is clear that the southern escarpment and highlands region has the highest priority, because of the association of a world natural heritage, the highland wadis (or mountain wadis), with the first priority areas. Azraq oasis, which is however outside this zone, is also a set of ecological priorities with environmental uniqueness. The linkage of environmental uniqueness with ecological priorities within the limits of a pertinent geographical area (set of nature conservation zones with development zones) permits a summary of priorities into 3 adjusted zones, which are (Fig 6.7.1):

- The Southern Zone: Wadi Ram, Gulf of Aqaba;
- The Western Zone: Dead Sea with escarpment, Wadi Araba with escarpment, King's highway axis;
- The Eastern Zone: Azraq Oasis area, including Safawi and Burq area.

(4) Actions in the Priority Areas

- Wadi Ram:
This area is already part of the Environmental Action Plan of the Gulf of Aqaba. The protection status that will be applied to this area is still unclear, but it appears

to be a top priority in order to save its natural and tourism resources. It could be a pilot project for establishment of national nature parks, with controlled tourism development, including mass tourism on its border and ecotourism inside. RSCN should have a significant role in this issue.

- Gulf of Aqaba:

This area is at the core of the Environmental Action Plan of the Gulf of Aqaba. Implementation of this plan is urgent in order to deal the best as possible with tourism development projects in this area.

- Dead Sea with escarpment:

This area will increasingly be the object of development projects. The JVA tourism development plan has included the potential for establishment of a regional natural park. Protection status of this area must be urgently defined. However, top priorities are the protection of coastline and significant landscape sites, as well as the enforcement of the control and sustainable use of the Wadi Mujib reserve. Like for Wadi Ram, coordination with RSCN is recommended.

- Wadi Araba with escarpment:

This area is still marginal but is extremely sensitive to human activities. The tourism potential of this area seems actually limited although it is a valuable area in terms of wildlife. The priority action here would be technical and financial support provided to the RSCN for starting wildlife conservation together with ecotourism project.

- Azraq Oasis area:

Restoration of the ecological conditions is the priority, as already done by the Azraq Project unit. Supporting the development of nature tourism in this area could be an element of the restoration program.

6.7.5 Implementation Steps

(1) Immediate Actions

a. Environmental Management (General Environment Corporation, RSCN)

- Nature conservation laws and institutional enforcement;
- Protection status of Wadi Ram, Petra, and Dead Sea natural areas;
- Physical marking of nature reserves;
- Clear EIA system for tourism projects;

-
- National biodiversity inventory;
 - Environmental education; and
 - Training of staff (DOE, RSCN).

b. Tourism Policy (MOTA)

- Identification and protection of nature tourism potential;
- Inclusion of MOTA as member of the High Council of the Environment Protection;
- Integrated development of culture / nature tourism;
- Harmonization of picnickers with international visitors within tourism sites;
- Social surveys for nature tourism; involvement of local communities;
- Quality enhancement of tourism sites, and control of tourism effects; and
- Initiation of EIA of projects; coordination of procedure with the General Environment Corporation.

(2) Next Actions

a. Environmental Management (General Environment Corporation, RSCN)

- Measures to stop overgrazing, and to control hunting;
- Environmental action plan; environmental planning; ecological zoning;
- Revision of the nature conservation system; establishment of natural parks;
- Improvement of urban environment; creation of amenities;

b. Tourism Policy (MOTA)

- Involvement of bedouins for nature tourism (cultural heritage, employment);
- Integrated development of nature tourism potential;
- Guidelines for nature tourism development;

Table 6.7.1 Review of Measures for Sustainable Tourism Strategy

	Measures	Regional
Target 1: Conservation of the Natural and Cultural Heritage	<p>Upgrading of current wildlife legislation; law for the creation and management of protected areas;</p> <p>Regulatory and institutional building for nature conservation areas and nature parks;</p> <p>Designation of natural parks (national or regional) for areas of natural interest; Conservation, restoration and development of environment as a tourism resource, and designation of sites of interest as natural / cultural patrimony;</p> <p>Financial and technical aid to leading environmental NGOs like RSCN and JES;</p> <p>Research programs on wildlife and rural society;</p> <p>Physical marking of limits of nature reserves</p>	<p>Need of EIA guidelines and procedures with agreement of General Environment Corporation for the rift valley (area under jurisdiction of JVA); Aqaba region has also EIA procedure;</p> <p>Initiate environmental planning for Petra, Aqaba, Shawbak, Dead Sea, and Amman;</p> <p>Designation of sites of interest to start with nature reserves and old villages;</p> <p>Consider the designation of Wadi Ram as a national park; and Dead Sea as a national or regional park.</p>
Target 2: Identification and Development of the Nature Tourism Potential	<p>Identification, protection, development of nature tourism potential;</p> <p>Wildlife surveys to identify the ecological value;</p> <p>Social surveys to identify the land use pattern and its effects on nature;</p> <p>Priorities for nature conservation, with ecological zoning;</p> <p>Discussion with local communities to find out needs and acceptability of tourism;</p> <p>Establishment of land use plan, with ecotourism development zones;</p> <p>Development of control and monitoring systems.</p>	<p>The areas of natural interest, which means those with nature tourism potential, have been tentatively defined in this study (Volume 2); they are:</p> <p>Dead Sea with (South) Escarpment;</p> <p>Wadi Araba;</p> <p>Southern Highlands (with Dana, Petra);</p> <p>Hisma (with Wadi Ram);</p> <p>Azraq oasis;</p> <p>Burq/Badia;</p> <p>Gulf of Aqaba.</p>

Table 6.7.1 Review of Measures for Sustainable Tourism Strategy (continued)

	Measures	Regional
Target 3: Development of sustainable tourism and ecotourism	<p>Programs of rehabilitation and development of existing sites; Project units should be designated within the MOTA for each important project site in order to develop integrated management; EIA of tourism project; approval process of EIA should be clarified and involve the General Environment Corporation as the approval agency; Development of EIA guidelines and ecotourism guidelines for specific regions; Coordination between tourism development actors, host community, and environmental agencies; coordination with RSCN, JVA, AQA, and other line agencies; Collection of entrance fees in designated sites, creation of job opportunities; Development of environmental awareness/environmental education; Development of environmentally friend facilities and products; Linking tourism development and nature protection with local communities; Land use plans; Information and monitoring</p>	<p>Ecotourism is tentatively developed by RSCN in Dana, and considered for Wadi Araba, Wadi Mujib, and Burq; a pilot project could be defined for Shawbak, which is an example of nature and culture heritage; The Dead Sea project at Zarqa Ma'in, defined in Part II, should be a pilot project for measures like environmentally friend, development of environmental education (museum), and coordination with picnickers activity; also Wadi Ram and Dana</p>

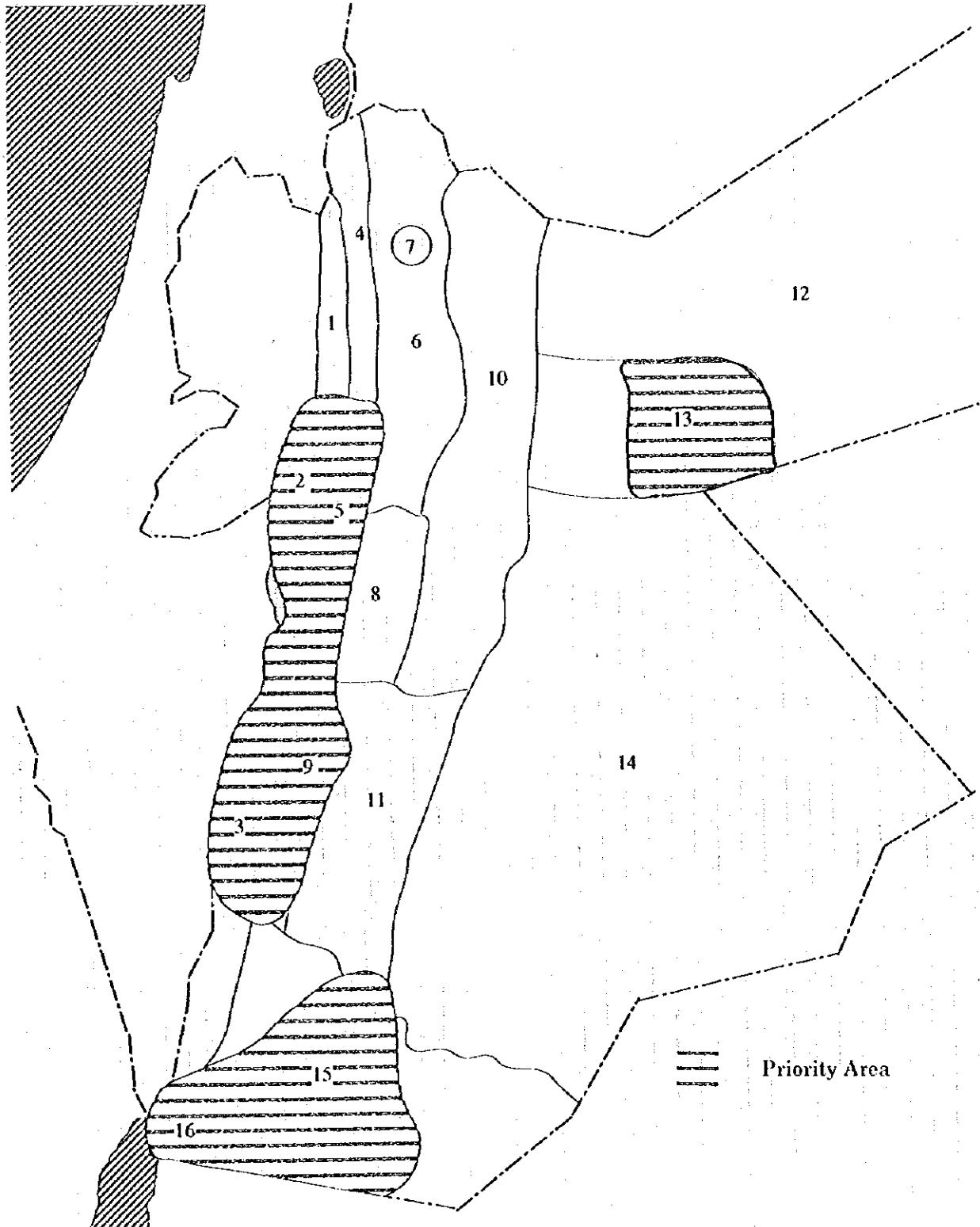
Source: JICA Study Team

Table 6.7.2 Priority Factors for Areas of Natural Interest

	Sensitive	Critical	Highly critical
Dead Sea with (South) Escarpment		x	
Wadi Araba	x		
Southern Highlands (with Dana, Petra)	x		
Hisma (with Wadi Ram)		x	
Burq/Badia	x		
Azraq oasis			x
Gulf of Aqaba		x	

Source: JICA Study Team

Figure 6.7.1 Location of Priority Areas



Note : The numbers refer to those in Table 6.4.1.

PART I (VOLUME 2)
NATIONAL TOURISM DEVELOPMENT STRATEGY AND POLICY
(SECTORAL DEVELOPMENT)

Chapter 7.

Power and Communication

Chapter 7. Power and Communication

7.1 Electric Power Supply

(1) Electric Power in the Energy Sector

The electricity sector was the largest oil based energy consumer in the Kingdom in 1993. It consumed 31.3% of the total energy followed by transport, industrial and domestic and other sectors. The use of electricity is steadily increasing because it is a more efficient and cleaner source of energy and is available to 98.9% of the population.

(2) Policies, Institutions and Legal Settings

The Ministry of Energy and Mineral Resources (MEMR) administers the energy sector of the Kingdom and has a clear policy for energy sector management and all aspects related to energy supply. The main policies are as follows:

- to meet the need of all the consumers of various types of energy according to their activities; and
- to reduce dependency as much as possible on imports by developing all indigenously available energy sources including renewable energy such as solar, wind, bio energy.

(3) Electricity Generation

Under the umbrella of MEMR, three organizations are engaged in power generation and supply. Jordan Electricity Authority (JEA) was established in accordance with special decree No.(21) of 1967, and restructured to a corporation according to Electricity Law No. 16 of 1986. It is further scheduled to be privatized in 1995. JEA is mainly responsible for power generation and transmission. For distribution in the two major load centers in Jordan, Amman and Irbid, Jordan Electric Power Company (JEPCO) and Irbid District Electric Company (IDECO). JEA produces about 92% of power and supplies to JEPCO, IDECO and a few industries e.g. oil refining, cement, potash, phosphates processing and water supply. It has retail sales at the non franchising areas of JEPCO and IDECO and also exports to Syria.

The energy generated for local consumption totaled 4,715 GWH in 1993. The proportions generated by each source are shown in Table 7.1.1.

Table 7.1.1 Proportions of Electricity Generation by Organization

Organization	Percentage
JEA	92.19 %
IDECO	0.19 %
Industrial Companies	7.56 %
Others (Municipalities)	0.06 %
Total	100.00 %

Source: MEMR

There are 11 power stations of which 9 are thermal units. The others are a hydro electric unit at the King Talal Dam and an experimental wind power mill in the Southern region. However the thermal units produce 99.5% of the total generated. The two stations, the Hussein thermal in Zarqa and the Aqaba thermal in Aqaba produce 83% of the total number. In 1993, one 30MW gas turbine was transferred from the Amman South station to Risha Power station to burn locally produced natural gas.

Jordan Electric Authority (JEA) has recently awarded a contract to purchase and install 3x30MW gas turbines. Two of them will be installed in Rehab substation (Mafrq Govern orate) burning diesel oil for peak load operation during the coming years. These two units will help in providing Irbid and Mafrq Govern orates with electrical energy. The third gas turbine unit will be installed at Risha Power Station to burn natural gas. This will increase the contribution of generation from natural gas in electricity production to 17%. Also the JEA has started to implement the second stage of Aqaba Thermal Power Station which includes the addition of two further steam generating units of 2 x 130 MW burning fuel oil. The project is expected to be in operation in the second half of 1997.

MEMR has continued to explore new and renewable sources of energy through an expanded program aimed to increase their contribution in the total primary energy mix. The program includes utilization of solar collectors for household and industrial water heating needs, and followed up the performance of experimental electricity generation plants utilizing wind turbines in remote areas, bio energy in rural area, geothermal energy in some selected areas, oil shale and nuclear energy. Jordan has rich deposits of oil shale (40 billion tons) which is expected to be used initially for power generation by direct firing.

The Electrical power system in Jordan includes some private power stations which could be synchronized with the rest of the power stations in the integrated network. The total installed capacity in Jordan at the end of 1993 was 1,047MW, of which

979MW is the capacity of the interconnected systems. Figure 7.1.1 shows the current electric power systems in Jordan.

(4) Transmission and Distribution

The interconnected system in Jordan consists of the main generating power stations and 400KV transmission network which is operated at 132KV. The 132 KV transmission network interconnects the power stations with the load centers and different areas in the Kingdom. The system also includes the 230KV tie line with Syria, and the distribution networks.

In order to reinforce the main substations supplying the two private distribution companies in Amman and Irbid, JEA built the Sabha substation of 2x40MVA 132/23 KV with the necessary 40km of 132KV overhead transmission line to the Hussein Thermal Power Station. Also Al Abdali substation 3x40MVA 132/33KV is under construction to be operation in 1995. In 1993 the JEA expanded Zarqa, Ghor Safi, Rehab and Risha substations by adding the necessary 132/33 KV main transformers and 132/33KV switching bays.

The five countries of Egypt, Iraq, Jordan, Syria and Turkey (EIJST) are currently studying a plan for regional cooperation in order to efficiently use the regions generating capacity and stabilize supply. The general trading agreement was signed by the ministers of the relevant countries in Amman in 1993. The first stage is expected to be in operation at the end of 1997.

(5) Electric Consumption

The peak load of the Jordan Electric Systems was 717MW in September 1993 compared to 667MW in 1992 with a growth rate of 7.5%. Generated electrical energy in 1993 amounted to 4,761 million KWH, which includes an export of 46 million KWH exported to Syria. Electricity consumed in Jordan during 1993 was 3,981 million KWH compared to 3,674 million KWH in 1992. This represents an annual growth rate of 8.4%. The average per capita consumption in 1993 was 1,136 KWH compared to 1,081 KWH in 1992. The balance of 780 MWH between generation and consumption is attributable to generation, transmission and distribution losses. The consumption of electricity by individual sector is shown in Table 7.1.2.

Table 7.1.2 Consumption by Sector

Sector	Consumption	%
Industrial	1,149	36.4
Domestic	1,192	29.9
Commercial	425	10.7
Water Pumping	702	17.6
Others	213	5.4
Total	3,981	100.0

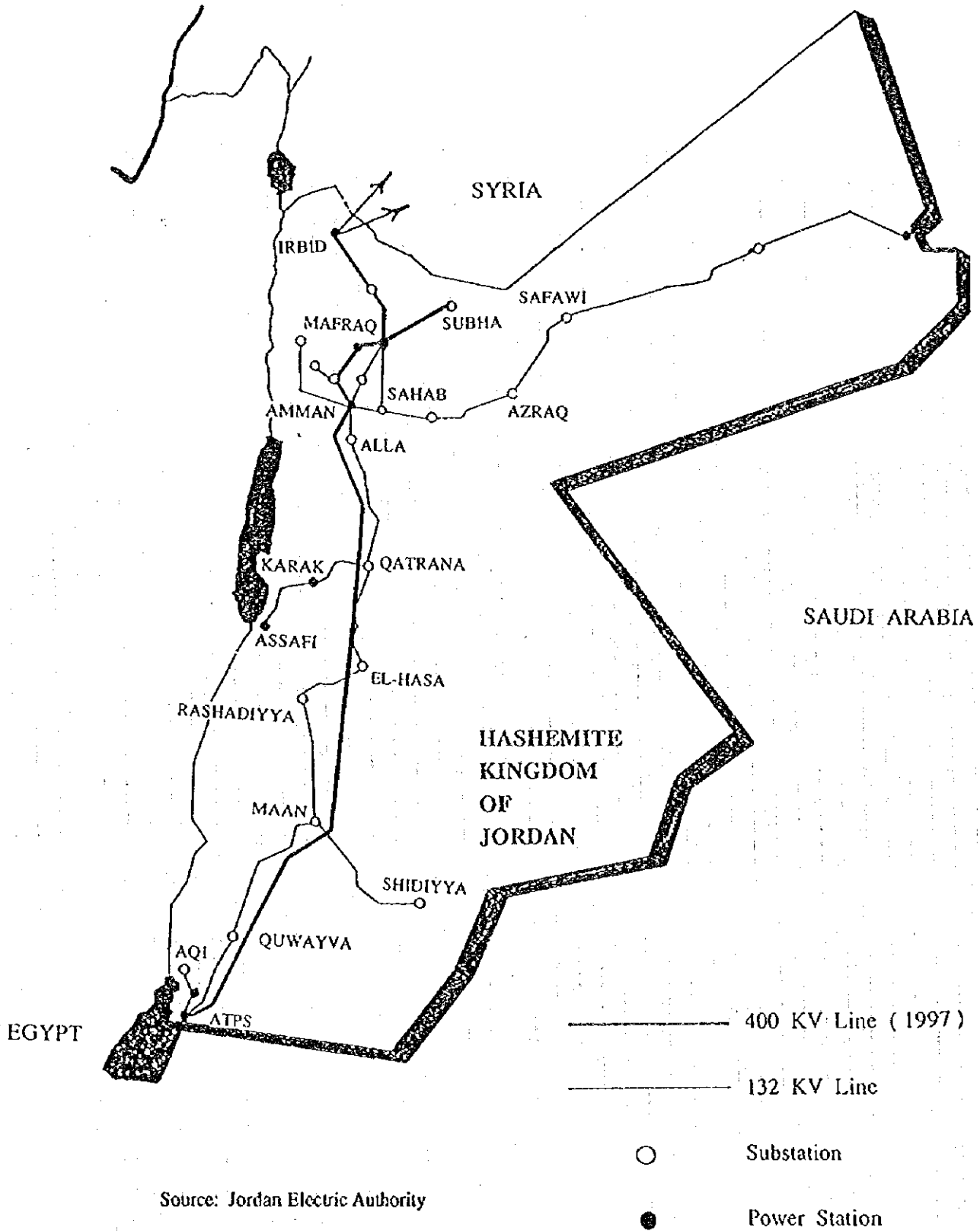
Source: MEMR

(6) Current Problems and Issues

Since there is adequate generating capacity to provide for national needs, and to export electricity to Syria and further 300MW is scheduled to be in operation in the coming few years, no major problems are envisaged in meeting new demand for regional tourism developments. However, developers of individual sites will need to advise the JEA of their requirements in good time to allow the transmission lines to be extended to the site within the development programs.

Environmental considerations, especially with regard to visual intrusion, should be a major consideration. The installation costs of underground distribution line are significantly greater than for overhead lines. Where underground cables are necessary a cost sharing formula among the concerned agencies such as JEA, JEPCO, IDECO, MOTA, MMRAE, and the developer will therefore be required.

Figure 7.1.1 Current Electric Power Systems in Jordan



7.2 Telecommunication

(1) Overview of Telecommunication

Table 4.5.1 shows the growth of telephone subscriber for the period from 1988 to 1992. It shows a very high degree of economic concentration on Amman which has 64% of telephone subscribers; together with Zarqa, they make up 73.7%. However, the average annual growth rate during this period was 8.5%. The share of both Amman and Irbid has slightly decreased while that of Zarqa has increased. Other areas have achieved a slightly higher growth rate than the national average. The average rate is 14 persons per telephone.

Table 7.2.1 Number of Telephone Subscribers

	1988	1989	1990	1991	1992
W. Kingdom	211,695	236,673	252,616	273,226	291,035
Amman	139,012	153,227	162,511	175,832	186,237
Irbid	31,945	32,657	33,002	39,870	42,780
Zarqa	20,247	22,157	24,530	26,037	28,288

Source: Statistical Yearbook 1992

Other available modes of communications are telex, facsimile and mobile telephone. The latter were recently introduced in the service area within a 30km radius from Amman. Public telephones are also available at a rate of 250 sets per local station and a prepaid card system at a cost of JD1, 5, and 10 has been newly introduced.

Figure 7.2.1 shows the existing systems. The National Switching Center (NSC) and International Switching Center (ISC) of the Telecommunications Corporation (TCC) are located in Abdali with regional and district nodes (exchange stations) connected by conventional cables, optical fiber cables, microwave or radio. To cope with ever increasing loads, TCC is building another modern central facility at Tla El Ali to function in tandem with those in Abdali. It is expected to be in operation in 1996.

(2) Policies, Institutions and Legal Settings

The state enterprise of TCC was created and empowered to build and operate, under the supervision of the Ministry of Posts and Telecommunications, a modern telecommunication systems for the Kingdom. Since then TCC has made its utmost efforts to meet the telecommunications needs and currently 77% of demand for basic service is satisfied. TCC generates more than JD120 million in revenues

contributing substantially to the treasury.

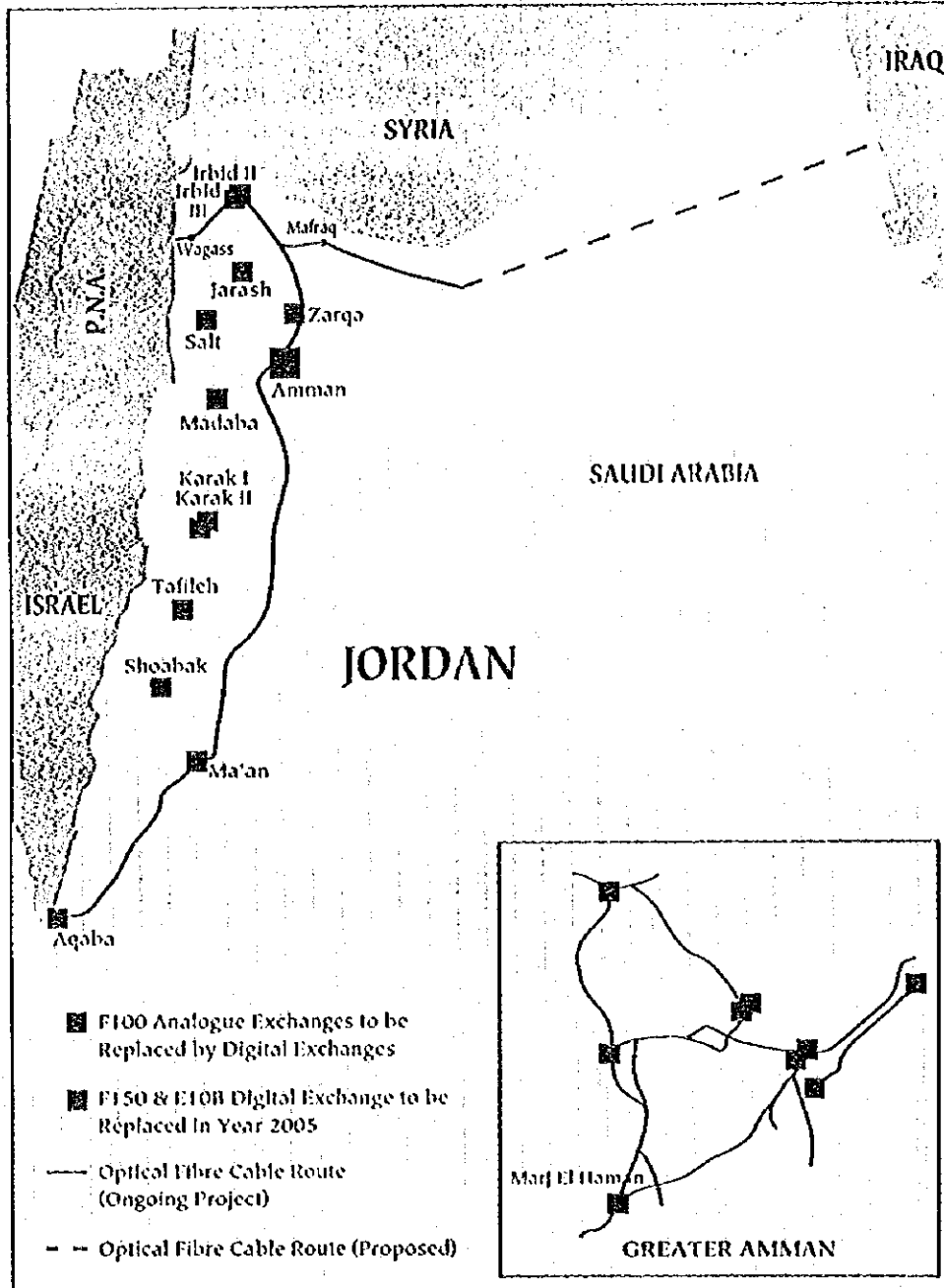
However, in line with a worldwide trend to restructure economies toward a free market system and in order to promote privatization of public enterprises, the government of Jordan decided last year to transform the TCC's status of monopoly to an autonomous commercial entity. It is expected that the process of commercialization will begin soon. The private sector will be allowed to enter into such services as radio paging and cellular phones when amendments have been made to the relevant laws.

(3) Current Problem and Issues

According to the TCC, any tourist project located within a 4km radius from the local node (exchange center) can be serviced without difficulty. However when such projects or zones are located outside of the service area, or where the required services are far greater than the capacity of the relevant local node, developers will need to contact with TCC well in advance in order to ensure appropriate programming. Those developers will probably be required to share some of the additional costs incurred by TCC.

However, the privatization of the TCC will allow it to install more advanced technology so that they will be able to offer more diversified services. The costs to subscribers are likely to be reduced substantially as newcomers enter into the market with the latest technology. This has been the situation in other countries. The resulting reductions in tariffs benefit not only tourism industries but also the general public.

Figure 7.2.1 Existing Mixed Modal Telecommunication Network



Source : Telecommunications Corporation





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