PERSGA

The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden

AQABA
SPECIAL ECONOMIC ZONE AUTHORITY

Sharing of ICZM Experiences-
Seeking Common Approaches:

Jordan Report on ICZM Experiences

PERSGA

Sharing of ICZM Experiences- Seeking Common Approaches:

Jordan Report on ICZM Experiences 2004

PERSGA – "The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden" is an intergovernmental organization dedicated to the conservation of the coastal and marine environments in the region.

The Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention), 1982 provides the legal foundation for PERSGA. The Secretariat of the Organization was formally established in Jeddah following the Cairo Declaration of September 1995. The PERSGA member states are: Djibouti, Egypt, Jordan, Palestine, Saudi Arabia, Somalia, Sudan, and Yemen.

PERSGA, P.O. Box 53662, Jeddah 21583, Kingdom of Saudi Arabia
Tel.: +966-2-657-3224. Fax: +966-2-652-1901. E-mail: information@persga.org

This document is a product of the Integrated Coastal Zone Management (ICZM) Component of the Strategic Action Programme (SAP) for the Red Sea and Gulf of Aden - a GEF funded project implemented by the United Nations Development Programme, the United Nations Environment Programme and the World Bank, and executed by PERSGA. The Component was led jointly by Ms. Khulood Tubaishat and Mr. Osama Qurban.

Section II of This report was prepared by national team includes:
Dr. Bilal Al- Bashir - Group Leader, Arch. Khalid Abu-Aishe and Arch. Thaer Haj- Ahmad - The writing team.

Section I and the final editing were prepared by Dr. Philip Tortell.

Table of Contents

List of Figures

List of Tables

Section I

Thoughts on Integrated Coastal Zone Management (ICZM) in Jordan

1- INTRODUCTION

The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) is executing the Strategic Action Programme (SAP) funded by the GEF through the World Bank, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) and other donor organisations.

The SAP was prepared following an extensive analysis of regional environmental issues and has been endorsed by the PERSGA Council of Ministers. The SAP provides a cooperatively developed framework for the long-term conservation and management of the coastal and marine resources of the Region. A programme of activities is being carried out through six complementary components: reduction of navigation risks and maritime pollution, the promotion of integrated coastal zone management, sustainable use of living marine resources, conservation of habitats and biodiversity, the establishment of marine protected areas, and the enhancement of public awareness and participation.

The Integrated Coastal Zone Management component has focussed primarily on the countries in the south of the region, providing capacity building and institutional strengthening in coastal planning and management through pilot projects and training.

The three northern countries, namely Jordan, Egypt and Saudi Arabia have had an active coastal planning and management programme for some time and have gained considerable experience. In order to record this experience, PERSGA initiated an evaluation of ICZM activities in Jordan, Egypt and Saudi Arabia and the recording of lessons learnt, with the aim of incorporating them in an ICZM Handbook for the Red Sea and Gulf of Aden Region.

Working Groups were set up in each of the three countries and their task was to prepare a Country Report on their ICZM experience with recommendations, if necessary, on improvements to make the process more effective. The work of the Groups was launched through a Workshop on ICZM which was held at CEDARE, Cairo, Egypt, in June 2003. The three draft Country Reports were presented to the Regional Seminar on Integrated Coastal Zone Management and Planning which was held at the Aqaba Marine Park Conference Centre, Aqaba, Jordan, in December 2003. The Reports were finalized and prepared for publication in January 2004 together with a Regional Overview. Copies are available from PERSGA.

These comments and recommendations are made by the Consultant at the request of the Government. They gather together and consolidate as well as augment, comments and advice provided earlier throughout the process of preparation of the individual Country Reports. They are based on information provided in the Country Report and gleaned from discussions and consultations during two visits to Aqaba.

2 - THE REPORT

2.1 The Task

The Objective of the Country Report was: The recording and evaluation of ICZM experiences and activities at the selected locality, noting the lessons learnt and with recommendations, if necessary, for improvements to the process to make it more effective.

The national Working Group, led by the Group Leader, was responsible for the preparation of the Country Report on ICZM experiences, with a focus on a selected locality. Using the suggested scope and format as a guide, and through extensive consultation with relevant stakeholders at national and local level, the Group was required to record the ICZM Process as applied at the selected locality. In particular, it was to outline the priority problems/threats to the coastal zone in the selected locality; determine when the ICZM Process was applied for the first time and what was the stimulus; describe the process as it was applied in terms of data gathering, formulation of the coastal profile, consultation, plan drafting, plan adoption and the plan implementation process.

The report was also expected to discuss who was involved in the consultation process, the extent to which there was participation by the public and by the Private Sector, the time it took to produce the approved ICZM Plan, the institutional framework for ICZM, the legislative base, any conflicts or inconsistencies with other legislation applied to the coastal zone, any identifiable improvements in the perceived problems, the strength of the political commitment now, at national and at local level, and the degree of public support and Private Sector support and the extent of their respective involvement.

The Jordanian Report was produced by Arch. Khalid Abu-Aishe and Arch. Thaer Haj-Ahmad of the Aqaba Special Economic Zone Authority (ASEZA), and is entitled - Sharing of ICZM Experiences, Seeking Common Approaches : Jordan Report on ICZM Experiences.

The Report is a very professional document. It is well-written and covers the subject in a comprehensive manner. It provides a good account of the historical and existing situations in Aqaba and a very good discussion of the ASEZA approach to coastal zone management. It analyses coastal planning and management in a critical manner and identifies strengths and weaknesses. It gleans lessons from the experience and makes valid recommendations on how the process can be improved.

The Jordan Country Report on ICZM represents a valuable assessment of the ICZM experience in Jordan and it will be valuable to the rest of the Red Sea and Gulf of Aden Region

2.2 Institutional Basis

One of the fundamental requirements of effective ICZM is a strong set of policies for management of the coastal environment and its resources. These must be followed by appropriate legislation or similar legal framework. Aqaba has received special treatment from the Government to ensure its survival as a lifeline of the Jordanian economy. This has meant clear policies for the use of the coast and its subsequent management through an integrated approach underpinned by adequate legislation. The Jordanian approach is an exercise in balancing the needs and requirements of different activities within a compact area with an aim of obtaining the maximum benefit.

ICZM needs a Coastal Planning/Management Authority (or its equivalent) in order to be effective. Jordan has a legal and operational authority in the form of ASEZA and this is seen as operating efficiently.

Likewise, effective ICZM requires a Coastal Planning/ Management Office, adequately staffed and resourced so it can implement the policies of the Coastal Planning/Management Authority, provide support and servicing of the Authority, and facilitate the planning and management processes. ASEZA is a legal entity that serves as a Coastal Planning/Management office, and it is fully operational.

2.3 Information Base and Identification of the Problems

Jordan is characterized by a very short coastline in an otherwise land-locked country. This makes its coast a very special national asset and Jordan has recognized this special status including the need for some form of integrated management. The Aqaba coastal zone has been the subject of surveys and investigations as well as plans and strategies. However, in the main, these have concentrated on the terrestrial environment. There is a need to extend this work into the aquatic environment in an integrated manner.

One of the first elements of ICZM is the "Coastal Profile" which identifies the resources and values that are to be managed, determines the threats, risks and other problems, establishes the demand and any conflict and generally establishes the baseline for planning and management. While it may not have followed the classical approach and developed a Coastal Profile for Aqaba, Jordan does have a very good idea of what is being managed in the coastal zone. More data would certainly be useful, especially on the aquatic side, but by and large the information base is adequate.

The Report identified a series of coastal zone problems as follows :

coastal construction (including dredging & reclamation), industrial pollution, cooling water discharge, solid waste and litter, oil spills and discharges, physical damage to coral reef, sewage discharges, air pollution (e.g. SO2 emissions), population pressures.

These problems/threats of the Jordanian coastal zone can be seen as comprising two main groupings, namely - physical alteration of the coastline, and pollution from land-based sources. These threats have impacts on ecosystems affecting coastal fisheries (both subsistence and commercial), special habitats (mangroves, seagrass meadows, coral reefs) and threatened species such as the dugong. They also have impacts on people by affecting **environmental** quality, employment and income, and sometimes their health.

Jordan has identified the main threats and problems that need to be addressed in the coastal zone. However, no thorough causal chain analysis has been conducted and the real root causes have not always been identified.

2.4 The Coastal Planning Process

The Plan formulation process is an essential element of ICZM and in Jordan this process is well developed and an effective and operative ICZM Plan has been produced to guide decision-makers, administrators, and managers. This Plan comes close to what is expected of an ICZM Plan, however, it is not exactly an ICZM Planning Process and neither is it as effective. In particular, the Plan needs to plan for water use (as well as for land use) and this needs to be done in an integrated and seamless manner.

Integration is a distinguishing feature of ICZM. A truly integrated approach for Plan development and implementation is essential if national objectives and targets for the coastal zone are to be achieved. Integration is required between Central and Local Government; between the various sectors in the Government/Administration; between the administration and the community; between the public sector and the private sector; and between different parts of the community. True integration can only take place following true participation. What is needed therefore is an integrated, participatory approach to solving coastal problems.

A good level of integration has been reached in Jordan particularly by bringing various administrative sectors at the local government level under the one authority (ASEZA). This now needs to be extended to include sectors beyond the administration and provide a truly integrated process, inclusive of the private sector more than in the past, as well as the general public.

2.5 Participation

ICZM is a participatory process and participation by various government sectors, the private sector, NGOs, and the general public is an essential element. As noted above, attempts have been made in Jordan by ASEZA and its predecessors to involve the public and other stakeholders. These have met with variable success and participation is probably still the weakest element in the Jordanian ICZM process. However, it has been recognized that more needs to be done in this direction and this must be commended.

For example, a low level of participation is thought to be affecting public awareness and sensitivity to environmental issues, which are considered to be still low. It must also be noted that it is virtually impossible to have meaningful public participation without adequate public information and real, meaningful public information is still elusive in general and as a result, public awareness is therefore still low and so is public participation.

As can be expected in the circumstances, there is a focus on enforcement rather than compliance because awareness and sensitivity are rather low. This, in turn, is the result of a low level of involvement and participation and perpetuates this interlinked cycle.

3- RECOMMENDATIONS

As noted above, Jordan has recognized the values and vulnerabilities of its precious coastal zone and has put in place a comparatively effective system to protect and manage it. The following recommendations (not necessarily in order of priority) are intended to further enhance the effectiveness of the integrated coastal zone planning and management effort in Jordan.

- Undertake further aquatic survey work (on an ecosystem basis) to document in detail the marine environment and its resources throughout the water column and complement the information available on the terrestrial environment.

- Extend the scope of the existing Land-Use Plan to include the aquatic area in terms of both seabed and surface in an integrated, seamless manner.

- Undertake a thorough analysis of the identified problems of the coastal zone (both land and water) to identify the root causes of the problems. Such an analysis should be conducted in a broad participatory manner and be the subject of a common consensus.

- Structure the involvement, through better integration, of stakeholders beyond the ASEZA and the administrative sector in plan formulation and implementation.

- Develop and implement a broad, coordinated and strategic approach to public information, public awareness and public participation to engender a sense of collective ownership and shared responsibility for their environment among those that depend on the coastal zone for their livelihood and well-being.

Section 2

Jordan Report on ICZM

Introduction

"Here we saw the Gulf narrowing towards its extremity, and on the opposite side a cluster of palm trees, within which, and completely hidden from view, was the end of our first stage, the fortress of Aqaba."

John Lloyd Stevens, 1836

Aqaba is Jordan's gateway to global commerce and a premier tourist destination. It is the only seafront for Jordan and it is strategically located at the crossroads of four countries and three continents. Situated at the northern tip of the Red Sea on the Gulf of Aqaba, the Aqaba Special Economic Zone (ASEZ) covers approximately 375km2 and has 27km of coastline. It extends to the land borders of Saudi Arabia and Israel, and the territorial waters of Egypt. It is a desert oasis with a year-round warm climate with average daily temperature ranging from 20o C in January to 40o C in August.

Aqaba has always stood at the crossroads of culture and trade. Human habitation of the city dates back to 4000 BC, a result of the city's strategic location at the junction of trading routes between Asia, Europe and Africa. The city, once known as Ayla, grew in regional importance as a northern port on the Red Sea, and the area was a center for copper smelting. In Roman times, the great Via Nova Traiana passed through Aqaba, connecting Damascus with Egypt. Today, Aqaba City has a population of approximately 80,000 inhabitants and it still retains its historical role as a hub for trade and culture.

In 2001, the Aqaba Special Economic Zone (ASEZ) was launched as a bold and timely initiative by the government of Jordan to recapture Aqaba's historical role as a regional hub for trade, tourism and culture; and to ensure that Aqaba's commercial and cultural prominence continues into the twenty-first century. The Aqaba Special Economic Zone Authority aimed at providing for a unique investment climate by offering a unique mix of tourism and industry in one location, with integrated planning; a unique infrastructure combining land, sea and air facilities with easy access to four countries and three continents; a high quality and trainable workforce; a one-stop shop with low levels of bureaucracy and streamlined procedures; a competitive investment incentive, including low taxes and duty free privileges; an access to world markets through international trade agreements; and, by offering natural, cultural, and historical attributes—a "living city" on the Red Sea with a high level of political stability.

The objective of this report is to record and evaluate the integrated coastal zone management experiences and activities in Aqaba. In Chapter One the report reviews existing conditions of ICZM before the establishment of ASEZA. It summarizes the legislative and legal framework of the Aqaba Region Authority (ARA), the environmental threats, and the conditions within which ICZM started. Chapter Two focuses on ASEZA's policy and structure to demonstrate in Chapter Three the improvements made toward a better integrated management of Aqaba's coastal zone. Finally, Chapter Four summarizes some lessons learnt from the ICZM experience in Aqaba and sets out recommendations for improvements.

Chapter 1: Existing Conditions before ASEZA

This chapter tries to identify the components of Integrated Coastal Zone Management (ICZM) in Aqaba during the Aqaba Region Authority's (ARA) era, summarize the problems that existed and represented a challenge to the ICZM process before the creation of the Aqaba Special Economic Zone Authority (ASEZA), and to describe the extent to which different levels of participation and consultation helped in achieving the Aqaba Region Authority's ICZM objectives.

1.1 ICZM before ASEZA

To fully review the conditions of ICZM before ASEZA, we are going to address the issue at two levels: First, at the legislative and legal framework level, and second, at the implementation and practical level.

1.1.1 The legislative and legal framework level

Although the government of Jordan had recently accomplished great progress in improving the legal and regulatory provisions for environmental protection at the international, national, and more specifically at a local level to preserve the Aqaba Coastal Zone, the ARA had a limited legislative and legal framework for marine environment protection. Until the end of 2000, Law No.12 of 1995 formed the basis of marine conservation and coastal management, and it was only in October 1999 that the General Cooperation for Environmental Protection (GCEP)—now recognized as the Ministry of Environment—released a by-law that addressed the marine environment and the coastal areas in greater detail. Yet, this by-law in general, and due to various omissions, did not lend itself to being an effective legal framework for the protection and management of coastal areas and did not mandate the ARA to any formal ICZM program.

a. National Laws, Standards and Guidelines

Under the Law of the Aqaba Region Authority, No. 7 (1987), broad powers of governance are assigned to the Aqaba Region Authority (ARA). These powers enabled the Authority to plan and execute projects in the industrial, tourism, agricultural and service sectors, and to supervise other public and private agencies undertaking projects in these sectors. The ARA Board of Directors included representatives of key ministries (Municipal, Rural Affairs and Environment; Planning; Industry and Trade; Tourism) as well as the Ports Corporation, the Army, and the Department of Lands and Survey. The Board was empowered to allocate lands,

Figure-1: Aerial photo of the Gulf of Aqaba

dispose of government properties, and promulgate permits and licenses for activities carried out in the region. The ARA was the leading organization in Aqaba to improve and strengthen environmental controls, environmental assessment procedures, and coastal zone management guidelines. As part of the preparatory phase of the World Bank/GEF-sponsored Gulf of Aqaba Environmental Action Plan, it set important future guidelines for any development activities in the Aqaba Region. Regulations for the implementation of the ARA Law were prepared by the ARA President, submitted to the ARA Board of Directors and subsequently to the Council of Ministers for approval.

In September 1995, the Law of Environmental Protection No. 12 (1995) was approved by the Jordanian parliament. A Royal Decree was issued to make the law effective as of the date of its publication in the Official Gazette, the 1st of October, 1995. It established a national framework for environmental policy, including the formation of a Higher Council for Environmental Protection on which the Secretary General of the Aqaba Region Authority sat as a member. The Higher Council set national environmental policy and reviewed proposed environmental laws, specifications and standards prepared by the General Cooperation for Environmental Protection—the primary body at the national level responsible for implementing pollution prevention regulations including inspection and monitoring. The Law also empowered the General Corporation to harmonize existing laws and settle current jurisdictional conflicts.

Other laws and regulations were also set to protect Aqaba's marine environment. (see table-1). Law No. 51 of 1961 banned ships from dumping soil, stones, sand, scum, toxic and chemical waste, or any other material on land or water. Appropriate measures under this law were required for the prevention of spills during the loading and unloading of ships and fines were set for the violation of any of its provisions. Aqaba Port Quarantine Law No. 32 (1972) also banned the discharge of ship-based pollution, including bilge water. Daily fees paid by ships for garbage collections were established under Port Services Fees Law No. 49 (1976). This law was amended in 1987 by the Port Services Fees Law No. 20 to make ship captains personally liable for polluting substances released from their vessels. In addition to setting applicable fines and prison terms, the Law required remediation at the responsible party's expense.

Some protection for fisheries and coral reefs was provided under Agriculture Law No. 20 (1973). This law provided for the issuance of fishing licenses pursuant to specified conditions, and additionally prohibited damage to or removal of coral reefs and shellfish. This was enforced by Article 25 of the Law of Environmental Protection which banned any harm to or removal of corals and shellfish from the Gulf of Aqaba and specified fines and prison terms for any violation.

The Ministry of Energy and Mineral resources, in consultation with the World Bank and the concerned local institutions, also prepared comprehensive environmental protection guidelines for all energy sector operations. These guidelines apply to the power sub sectors, oil and gas operations, refineries and petroleum products' storage and distribution, oil and gas pipelines, and vehicle emissions. Table-1 lists the main national laws and regulations and the government agencies involved in their implementation.

Table -1: National Laws and Regulations

National Laws and Regulations	Year inforced	Government Agency Concerned
Law of Environmental Protection No. 12	1995	Higher Council for Environmental Protection General Corporation for Environmental Protection
Jordan Specification Standard No. 893	1994	Water Authority of Jordan
Jordan Specification Standard No. 202	1982	Water Authority of Jordan
Laws of the Aqaba Region Authority No. 7	1987	Aqaba Region Authority
Port Services Fees Law, No. 49	1976	Ports Corporation
Port Services Fees Law No. 20	1987	Ports Corporation
Agricultural Law, No. 20	1973	Ministry of Agriculture
Aqaba Port Quarantine Law No. 32	1972	Ports Corporation
Shipping Law No. 51	1961	Ports Corporation

b. International and Regional Treaties, Conventions and Agreements

Jordan is party to eight principal international conventions to enforce the protection of the Gulf of Aqaba marine life:

1. The International Convention for the Prevention of Pollution of the Sea by Oil. This convention established controls on oil discharges from ships and considers the Red Sea, including the Gulf of Aqaba, a special zone where heightened protection applies.

2. The Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matters regulated the disposal of waste and other matters from ships, aircraft, platforms and other structures into the water.

3. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This convention regulated the export and import between CITES parties of listed wild species of flora and fauna including marine life. In addition CITES parties established trade restrictions on endangered species of flora and fauna within their jurisdiction.

4. The International Convention for the Prevention of Pollution from Ships (MARPOL). Annex I of this Convention (mandatory for all parties) proclaimed the Red Sea and Gulf of Aqaba as a special area where the discharge of oil and oily residues is prohibited. To foster compliance with this ban, parties were required to provide reception facilities for oil and oily residues from tankers and other ships using their ports. Under Annex II (also mandatory), the convention also banned the discharge of certain categories of noxious liquid substances and required parties to provide port reception facilities for such substances.

5. The Regional Convention for the Conservation of the Red Sea and the Gulf of Aden Environment (Jeddah Convention) aimed to protect the Red Sea, Gulf of Aden and Gulf of Aqaba environments. Article 6 of the Convention called for appropriate measures against water and airborne pollution originating from land. The convention also sought to facilitate regional cooperation in preventing pollution by oil and other harmful sub-

stance, to establish a marine pollution emergency response center, and to start procedures for the exchange of scientific data and regional technical assistance.

6. The Convention for the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal (Basel Convention). Jordan declared its territory as forbidden to the importation or transshipment of foreign hazardous wastes.

7. The United Nations Convention on Biological Diversity which required parties to take conservation and sustainable use of biological resources into account when making policy decisions. Measures required under this convention include the establishment of protected areas; the identification and monitoring of biological diversity components and potentially adverse impacts on those components; and the preparation of emergency response plans where human actions may pose a grave danger to biological diversity.

8. The United Nations Framework Convention on Climate Change has the objective of stabilizing carbon dioxide and other greenhouse gas concentrations in the atmosphere at levels that would prevent dangerous interference with the climate system. Sea level rise, one of the widely anticipated results of global warming, could have a significant impact on the Gulf of Aqaba marine and coastal ecosystems. Parties are required to prepare national greenhouse gas inventories and take climate change into account, to the extent feasible, in their social, economic and environmental policies.

1.1.2 The Implementation and Practice Level

The Aqaba Region Authority did not formally constitute an ICZM program. However, the integrated approach for management of coastal areas was incorporated in the Authority's existing structure and thus an ICZM approach was partially adopted. The awareness for the need of a more elaborate ICZM approach was due to political recognition that with Aqaba's short coastline, its unique marine life, and the multi-functions it accommodates (tourism, industry, ports), it is becoming increasingly difficult to protect, conserve and manage all coastal recourses in the zone.

Optimal management of the coastal zone was required and recommended by the National Environment Strategy for Jordan Report which was published in 1991. The report referred to the 1987 Master Plan (Figure-2) which was prepared by the Aqaba Region Authority. The plan was based on a complete study of the marine environment and its biological, chemical, and physical elements, sea currents and waves, the coral reefs, seabed maps and remote sensing. The plan considered decreasing installations adjacent to the coast and alternatives were investigated to allow for environment friendly developments that would not lead to deterioration of the coastal zone. Based on this map a revised land-use Master Plan was finalized in 1995 projecting development up to 2020 (Figure-3).

Based on the National Environmental Strategy recommendations, and to set the basis for an integrated coastal zone management in Aqaba, the ARA asked Roy B. Mann in 1995 to help the first Coastal Zone Management Guidelines. His report, "Coastal Zone Management Guidelines and Standards for Tourism and Urban Development in the Aqaba Region of Jordan" was a clear framework for coastal zone management based on the 1995 revised master plan shown in Figure-3. It was assumed that Mann's report would lead to the drafting of a regulatory framework for coastal protection and management. Yet the absence of a clear institutional and legal setup limited the ARA's ability to adopt and implement such regulations. This issue was reemphasized by Michael Pearson—an international ICZM Consultant who was commissioned in 1999 by the ARA through the GEF/Word Bank funded project: Gulf of Aqaba Environmental Action Plan (GAEAP)—to finalize and implement the CZM guidelines. The result of his mission was a very valuable report entitled "An Assessment of Coastal Zone Management and EIA Procedures Applicable to the Aqaba

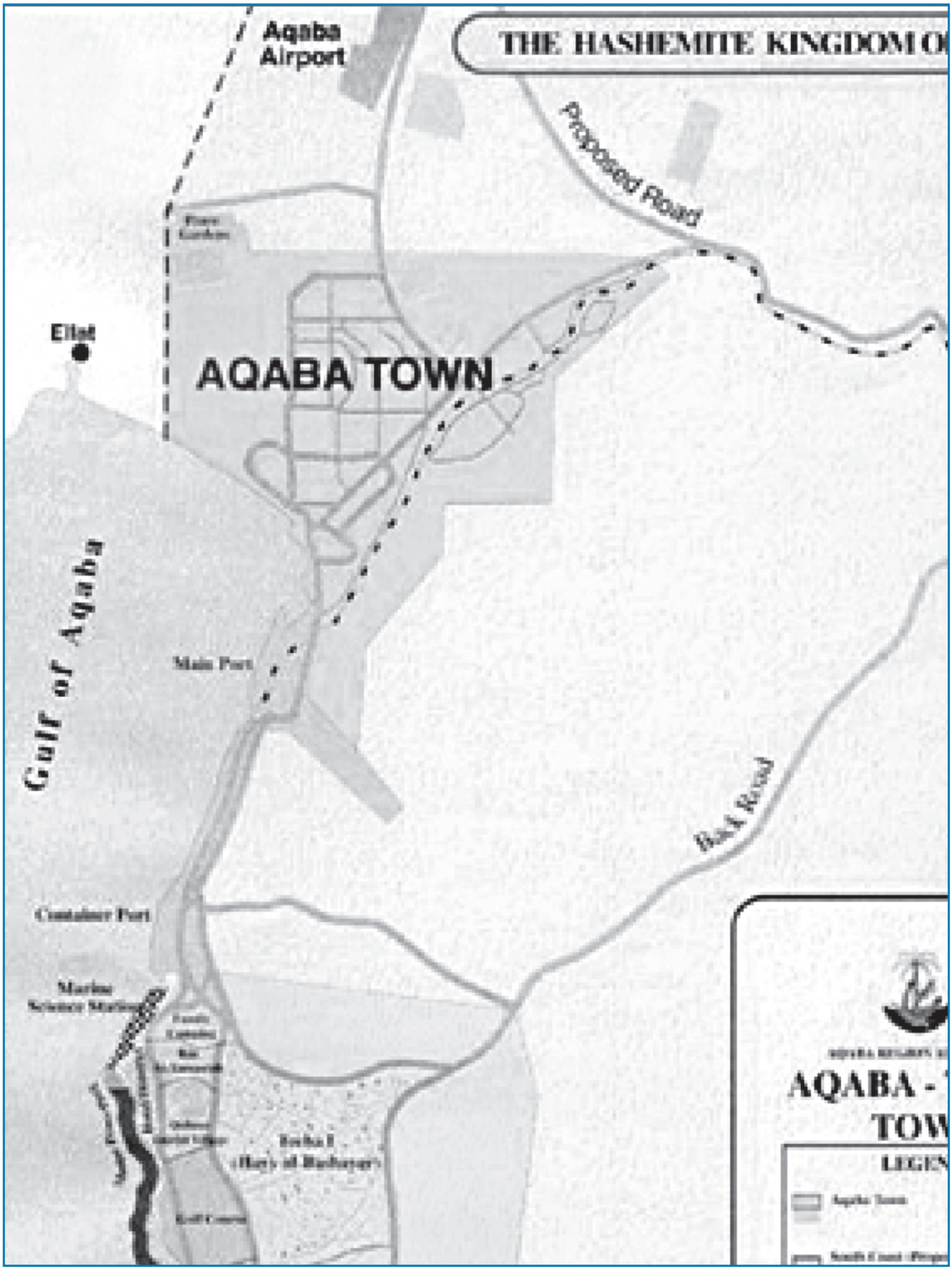


Figure-2: 1987 Aqaba Master Plan

Figure-3: 1995 Revised Aqaba Master Plan

Coastal Zone". Unfortunately, he failed to achieve the main goal namely, the adoption and implementation of a comprehension legal framework for the management of the Aqaba coastline.

In 1996 the Government of Jordan took another step towards the implementation of an efficient coastal zone management program through one component of the GAEAP which was aimed at the development of a regulatory and institutional framework for the Gulf of Aqaba environmental protection and successfully initiated the implementation of the Environmental Impact Assessment (EIA) guidelines in Aqaba. It also helped the ARA to strengthen its capacity to minimize adverse transboundary environmental impacts, to adopt and implement the proposed CZM guidelines, to train its staff on the know-how of implementing CZM and EIA guidelines, and to assist the ARA in preparing project specific EIA requirements and reviewing environmental impact statements. Since then, the ARA implemented a great part of the infrastructure projects planned in the 1985 master plan, established an environmental committee to review projects impacts, coordinated the construction of sewage treatment plant and a back road to divert heavy truck traffic away from coastal areas, upgraded cleanliness of the port, identified three coral reserves, and established a diving center.

Despite all these accomplishments, the ARA did not have enough legal support for a stronger implementation of ICZM. ARA was unable to provide comprehensive and integrated processes to guide and assess existing and future projet in Aqaba.

1.2 Environmental Threats

Environmental problems in the northern parts of the Gulf of Aqaba are primarily induced by industrial and associated transportation activities. In addition, environmental problems which are related to wastewater, solid waste, fishing and coral reef destruction are exacerbated by the increasing population of Aqaba and the number of tourists visiting the area. The main environmental threats can be summarized as follows:

1. Coastal Constructions Related Threats

It has been estimated that 30-40 % of the coastline has been altered by coastal constructions. This includes roads, ports, marinas, power plants, factories and cooling water outlets.

2. Industrial Related Threats/Chemical and Thermal Threats:

- Fertilizer Plant:

The Jordan Phosphate Mines Company/Industrial Complex (JPMC-IC) produces 740,000 tonnes of Di-Ammonium Phosphate (DAD) and 270,000 tonnes of phosphoric acid annually. Chlorinated cooling water is released from the factory into the Gulf at a rate of 20,000 m3 per hour, at a discharge point located 150m from shore at a depth of 27m. The cooling water is about 3°C above ambient sea water temperature.

- Fertilizer related chemicals:

Accidental spills during ship loading of fertilizer product onto ships, and unloading of raw Sulphur and Ammonia from ships berthing at the industrial port in the vicinity of the JPMC-IC pose a risk to the environment. The 30,000 tonne on-site Ammonia storage tank (cooled Ammonia at –32°C) is another health and environmental hazard.

- Potash storage facility:

At the Arab Potash Company's stores, about 75,000 tonnes of Potash are in two partially enclosed storage sheds. Accidental release to the marine environment poses an environmental hazard.

- Thermal Power plant/Jordan Electricity Authority:

The present Thermal Power Plant (TPP), which is a 260MW station, and the future 260MW station at the same site, use seawater for cooling purposes. At present some 38,000 m3 of cooling water are discharged into the Gulf from an outlet 20m below the surface and 200m from shore. The temperature is about 3°C above ambient water temperature.

3. Phosphate Dust from Port Activities

According to official reports, 3.5 to 6.4 million tonnes of raw Phosphate are exported through the Gulf of Aqaba. Phosphate dust generated during ship loading is considered an important environmental problem in Aqaba due to the fact that a high percentage of this dust is lost and settles on the Gulf's water. The environmental effects of the dust include reduction in water clarity, reduction in light penetration rate, and slow coral growth rates. Other possible effects are higher levels of dissolved Phosphate nutrients, and other toxic heavy metals such as As and Zn.

4. Solid Waste

Solid waste is considered a serious environmental problem on beaches and on the reefs of the Gulf of Aqaba. This waste is generated by ferry passengers, ship crews, beach visitors and local residents. The Port of Aqaba has solid waste receptacles and provides a daily garbage collection service via barge to ships anchored offshore. Each day 30 tonnes of solid waste is collected by the Port of Aqaba.

5. Oil spills

More than 2300 ships use the port of Aqaba each year. In addition, tankers with a capacity of 100,000 – 150,000 tonnes of crude oil arrive at Eilat oil terminal every week, unloading about 3.5 million tonnes of oil per year. Accidental oil spills could have disastrous effects on coral reef ecosystems in the Gulf. It is hoped that the Upper Gulf of Aqaba Oil Spill Cooperation Project (UGAOSCP) which has been launched with the support of the EU and the Government of Japan will achieve it aims. The target of this project is to create an effective strategy for combating small to medium-sized oil spills (600 tonnes), with oil spill response centers in each of the three countries. Table-2 illustrates environmental threats from oil spills and industrial activities.

6. Reef Damage

The increasing numbers of divers and tourists who visit the reef areas have caused great damage to the corals in many parts of the Gulf of Aqaba and the number of tourists is still increasing as Figures 4 and 5 show. In Eilat there are 10 scuba diving clubs that operate 363 days a year. They operate 200,000 to 300,000 dives per year along the 1.2 km Coral Reserve. In addition, six glass-bottom boats cruise the same area every day, making about 8000 cruises per year. Furthermore, the diving clubs arrange diving courses for more than 20,000 training dives in the same area every year. By comparison, Jordan has four diving centers in Aqaba which can host about 160 divers at a time and the interest in diving the unique corals of Aqaba is growing. It is estimated that 3000 divers have used the water of the Gulf in 1993 compared to only 1250 divers in 1989.

7. Sewage discharge

There is zero sewage discharge from Aqaba town into the sea. The current 4500m3 daily sewage effluent is piped to and received in Aqaba sewage treatment plant, 4km north of Aqaba city. It is then treated by oxidation in a three-stage lined pond system. From Eilat (Israel) some 4 million m3 of primary treated sewage flow into the Gulf each year from a creek located just 700m from the Jordanian border. Health risk, phytoplankton and algal blooms and coral degradation are the possible consequences of this environmental problem.

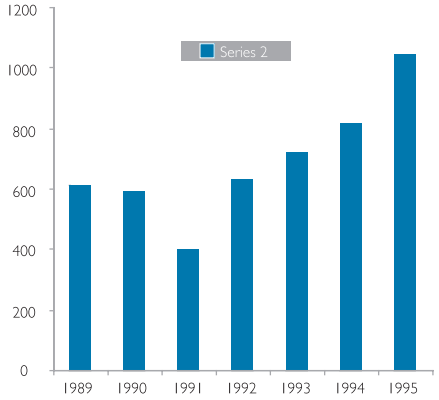


Figure-4: Tourist arrival in Jordan (in thousands)
Source: Central Bank of Jordan- Annual report 1994.

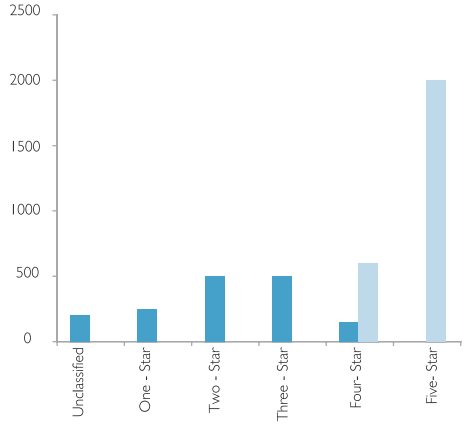


Figure-5: Current and proposed hotel rooms in Aqaba

Table-2: Threats to Coastal Environment and Marine Resources from oil spills and industrial activities.

Issue	Impacts	Immediate Causes	Root Causes	Scale	Severity
A. Oil Pollution from Ships					
Frequent small oil spills (less than 20 tonnes)	Damage to marine life and beach contamination	Discharge of ballast and bilge water	Lack of reception facilities and enforcement authority	Regional	Moderate
Oil spills of 2 - 20 tonnes	Damage to marine life, beach contamination	Bunker oil spill	Inadequate control and monitoring of procedures, equipment and personnel	Regional	Moderate
Oil spills of up to 100 tonnes	Damage to marine life, beach contamination	Discharge from pipelines or terminals	Inadequate control and monitoring of procedures, equipment and personnel	Regional	Severe
Potential oil spill of up to 150,000 tonnes	Destruction of marine habitats, devastation of beaches	Rupture of oil tanks in collision or wreckage	Insufficient tanker safety specifications, inadequate personnel and navigation procedures	Regional	Severe
B. Pollution from Coastal Industries					
ndustrial chemical spills	IHealth risk and potential damage to marine life	Accidental spill during transport, storage or use of chemicals	Indequate control and monitoring of hazardous substances	Local	Moderate
Air Pollution - SO2 emissions	Health risk and deterioration of aesthetics	Release of SO2 from power plant and fertilizer plant	Indequate air pollution control regulations ,monitoring and enforcement	Local	Moderate
Cooling water discharges	Alteration of marine environment	Release of cooling waters from power plant and fertilizer plant	Inadequate thermal pollution control standards, monitoring and enforcement	Local	Low
IPhosphate dust emissions	Decreased coral growth around phosphate port	Release of phosphate dust during port operations	Inadequate pollution control standards, monitoring and enforcement	Local	Low
Gypsum disposal	Potential leaching of gypsum into the Gulf, or seepage into groundwater	Unconfined storage of gypsum at the fertilizer factory	Lack of hazardous waste disposal siting, regulation and enforcement	Local	Low

8. Population:
With its only 27km of coastline Aqaba is facing the pressures of economical growth of the region with the accompanying growth in population. As illustrated in Figure-6, since 1972, Aqaba has grown from a town of 10,000 to its current population of 80,000. The projected population for the year 2020 is 150,000.

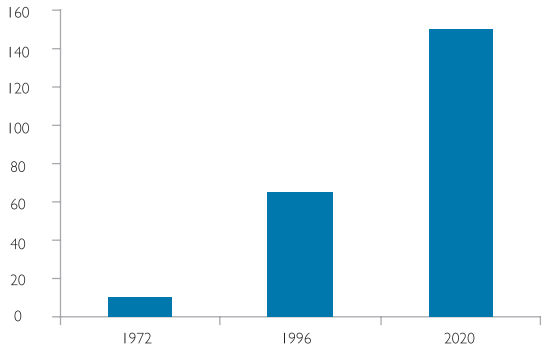


Figure-6: Aqaba Population (in thousands)
Source: Gulf of Aqaba Environmental Action Plan, 1996

9. Air Pollution
The major source of air pollution in the region is fossil fuel combustion resulting from industrial activities and other processes. The fuel used, which contains between 3.5-4% sulfur, together with other industrial processes have increased the concentration of SO2 in ambient air. The sources for solid particulates in the region are: windblown dust from dry soil; local re-entrained dust emissions from roads together with the combustion of fossil fuels; industrial processes; transporting and handling of phosphate rock and other raw materials such as potash, as well as the photochemical reactions and dry deposition of pollutants in the atmosphere.

1.3 Participation, Consultation and Public Awareness

General ICZM programs require a high deree of participation, especially from stakeholders and local communities who utilize the coastal resources, and eventually, would be greatly affected by any new regulations or procedures. So, in order to gain their support and to engage them in the decision making process, the Government of Jordan through the National Environmental Strategy has proposed the formulation of an advisory committee called the Coastal Zone and Marine Resources Committee. This committee had members representing the private sector, the military, and the governmental and non-government organizations in the Aqaba region. The committee had representatives from:

- The Royal Navy and Coast Guard
- The Ministry of Municipal and Rural Affairs
- Jordan University and Yarmouk University represented by the Marine Science Station (MSS)
- The Royal Society for the Conservation of Nature (RSCN)
- Aqaba Region Authority (ARA)
- The Port Corporation
- The Royal Diving Center
- The Jordan Phosphate Company
- Arab Potash Company
- The Jordanian Union for Land Transportation
- Aqaumarina Hotels and Diving Club
- Representatives of the Local Community

This committee, which was envisioned by the GAEAP, was encouraged by the local government to participate in decision-making, goal setting and conflict resolution in the coastal zone. Its participation was a vital tool available to the ARA's planners and policy makers to understand the concerns of all sectors and hence find suitable solutions. The committee was involved in the process of investigating and identifying the best alternatives for sustainable development in Aqaba.

Another success story of the ARA and the GAEAP project was the establishment of the Aqaba Marine Park. The project was created to protect, conserve, and manage the natural near-shore marine environment of the Aqaba south coast region with its rich

biodiversity, while allowing for certain touristic uses at sustainable level. Representatives from the local community, the ARA, the academic and research institutions, the private sector and NGOs took part in the process that led to the creation of the Aqaba Marine Park. This participation was facilitated through a series of consultative meetings and public hearing sessions conducted in Amman and Aqaba both in Arabic and English. International consultants from Egypt, IUCN, NOAA and USAID and non-governmental stakeholders such as the Royal Society for the Conservation of Nature, the Jordan Environment Society, the Aqaba Fishermen's Cooperation (AFC), the Marine Science Station, diving clubs, ferry boat operators, glass-bottom boat operators, and hotels also took part in preparing, implementing, and enforcing the Aqaba Marine Park and its management. All stakeholders shared one common goal: the preservation of the marine life and the coral reefs of the Gulf of Aqaba.

Despite the fact that ARA took the necessary steps to raise public awareness about marine life and coastal resources, yet there were still many illegal and irresponsible practices by the public at all levels. The ARA needed to adopt and implement a long-term education policy that would raise public awareness to correspond to the economic growth of the region. This was an area where the new Aqaba Special Economic Zone Authority (ASEZA) can continue the accomplishments of the ARA.

Chapter 2: ASEZA's Administrative Fram Work

2.1 The Policy

Article (3):

"The aim of the establishment of the Zone is to enhance economic capability in the Kingdom by attracting different economic activities and investment thereto."

Article (7)/a:

"An authority to be known as the "Aqaba Special Economic Zone Authority" shall be established in the Kingdom and shall have a juridical personality with financial administrative autonomy. As such, the Authority may acquire movable and immovable property and perform all legal acts necessary to achieve its objectives, including concluding contacts, accepting aids, grants and donations and litigations. The Civil Attorney General or any attorney appointed by the Authority for this purpose shall represent the Authority in any legal proceedings."

Article (8)/a:

"As of the date specified by the Council of ministers, the Authority shall become the legal and factual successor of the Aqaba Region Authority and the municipality of Aqaba according to the provisions of this Law." [1]

ASEZA strives to create a globally competitive center for tourism and recreation services, hi-tech industry, multi-modal transportation, professional services, logistics and value-added industries. ASEZA is committed to creating and preserving Aqaba as a competitive international investment location, maintaining a streamlined investment environment, and encouraging private sector participation in all aspects of the zone's development and operations.

ASEZA is genuinely committed to providing:

1. A one-stop investment center that serves as a single point of decision making that will facilitate business startup and smooth operation.
2. A package of streamlined investment and operating procedures, including simplified business registration and licensing.
3. A model approach to environmentally sustainable development and governance.
4. A world-class business environment that maximizes private sector participation in duty-free, tax-advantaged and flexible regulatory operations system.

1= *Aqaba Special Economic Zone: Aqaba Special Economic Zone Law: Law no. (32) for the year 2000. Article (3)(7) and (8) pp. 3-6.*

2.2 The Structure

The Aqaba Special Economic Zone Authority (ASEZA) is administered and supervised by a board known as the "Board of Commissioners", which is composed of six full-time minister-level members, including the Chief Commissioner and the Vice-Chief Commissioner. Each of the commissioners is responsible for a major area of regulatory or operational activity, as listed below, to provide a service-oriented organization integrated as Figure-7 illustrates:

1. The Administration and Finance Commission
2. The Customs and Revenue Commission
3. The Investment and Economic Develop
4. The Land, Infrastructure and Services Commission
5. The Environment and Health Control Commission

According to articles (9) and (10) of the Aqaba Special Economic Zone (Law no. 32), the authority shall perform the following functions and assume the following responsibilities :

a- Develop and qualify the Zone to attract investments and create an advanced investment environment to stimulate industry, trade, tourism and services in the Zone.

b- Increase job opportunities for Jordanians, and coordinate and cooperate with investing entities in the Zone to train, qualify and enhance the capacity of Jordanian manpower and accord it priority in employment.

c- Enhance the role of the private sector in participating in the development of the Zone, including providing infrastructure services and any public services.

d- Encourage competition and prevent monopoly in the various economic activities within the Zone.

e- Plan, design and execute projects for the development of the Zone in various fields, directly or through other parties.

f- Protect the environment in the Zone.

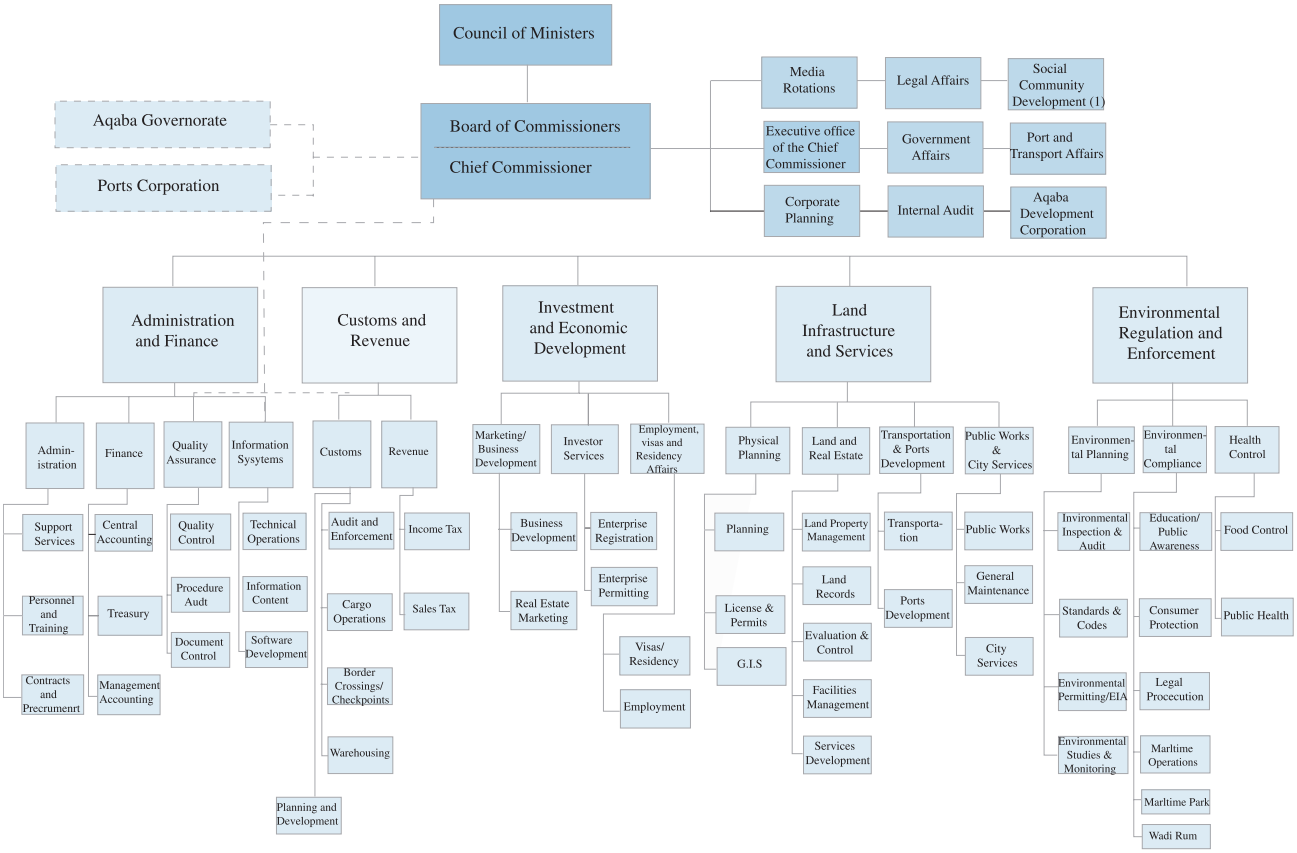
g- Encourage Registered Enterprises to conduct and support research and development.

Within the perimeters of the Zone, the Authority shall, according to the provisions of this Law, assume the functions and authorities relating to the following:

1. Regulating and monitoring economic activities.
2. Issuing permits and certificates and any other authorizations which pertain to conducting economic activities in the Zone.
3. Zoning of cities, villages and buildings.
4. Municipal affairs.
5. Protecting the environment, water resources, natural resources and biological diversity.
6. Controlling procedures of imported and exported food to or from the Zone and control and inspection procedures for all places for slaughtering, preparing, manufacturing, circulating, selling and catering foodstuffs and their derivatives in the Zone.
7. Customs procedures and matters.
8. Collecting the taxes, fees, fines and service charges.

In order to identify and evaluating the ingredients of integrated coastal zone management in ASEZ (the purpose of this report), it is important to briefly illustrate the objectives and responsibilities of three commissions: the Investment and Economic Development Commission; the Land, Infrastructure and Services Commission; and the Environmental Regulation and Enforcement Commission.

Figure 7: ASEZA Structure



2.2.1 The Investment and Economic Development Commission

The success of the ASEZ will be measured by the ability of the Zone to attract and retain substantial private investment from foreign and domestic sources and to create jobs and economic opportunities for residents of Aqaba and the rest of Jordan. The Investment Commission has two primary duties to fulfill:

1. Promoting ASEZ by reflecting its unique advantages and providing for an investment climate based on economic liberalization according to Regulation No.(11) for the year 2001: Regulation for the Development and Improvement of the Investment Climate for the Aqaba Special Economic Zone.

2. Providing a one-stop investment center that serves as a single point of decision making to facilitate business registration and permitting. Whoever wishes to conduct any economic activity in the Zone and seeks to benefit from any privileges and exemptions, shall apply to the Authority for registration as a registered Enterprise. Also, commencing an economic activity in the zone is conditional upon the enterprise's obtaining a permit to assure the protection of public health, the environment, public safety, public economic interest, investment promotion in public utilities or the protection of the security and Public Order.[2] These two processes of permitting and registering will be illustrated and used as examples of integrated coastal zone operations in Chapter 3.

2.2.2 The Environment and Health Control Commission

Article (52):

"For implementation of the provisions of this Law, the Board shall be responsible for protecting and maintaining the environment in the Zone and for ensuring sustainable development according to the basis and standards determined pursuant to a regulation, provided that such shall not be below the adopted levels in the Kingdom. For this purpose, the Authority shall assume the powers of the Public Corporation for Environmental Protection. The chief Commissioner shall assume, as the case may be, the powers accorded to the Minister and the Director General stipulated in the Environment Protection Law in force."[3]

Environmental and health-related planning and regulation are key components of the ASEZA's complement of functions. The ASEZ's natural environment is one of its most precious and important assets. Aqaba is Jordan's only access to the sea and hosts a fragile ecosystem that will be challenged by ASEZ's multi-sector development strategy. The protection of Aqaba's coastal areas, water and other natural resources, as well as public health are key elements of any strategy to attract tourism and investment and ensure that economic activities are environmentally sustainable.

The ASEZA has absorbed into the Commission for Environment and Health Control a number of functions from its precursors, the Aqaba Region Authority and the Aqaba Municipality, along with several other functions mandated by law. Its legal mandate includes:

- The management and protection of the environment, water resources, natural resources and biological diversity within the ASEZ.
- The administration and regulation of the coastal areas in the ASEZ, including the Aqaba Marine Park.
- The responsibility for ensuring ASEZ's sustainable development.
- The provision of health inspection at the ASEZ's international borders.
- The supervision of all public health, occupational health and food-related activities within the ASEZ.
- The monitoring and inspection of zone users and the extraction of fines and compensations for environmental violations.

2= *Regulation No. (11) for the Year 2001: Regulation for the Development and Improvement of the Investment Climate for the Aqaba Special Economic Zone. Article (4).*
3= *Aqaba Special Economic Zone: Aqaba Special Economic Zone Law: Law no. (32) for the year 2000. Article (52) p.33.*

To fulfill the above mandate, the Environment Commission, through its three component directorates for Environmental Planning, Environmental Compliance and Health Control, has addressed-and accomplished a lot in-the following:

- Staffing and training of department personnel.
- Outsourcing selected operational activities.
- Improving environmental monitoring and analysis.
- Developing and implementing of standards and requirements.
- Improving environmental compliance.
- Clarifying responsibilities in areas requiring cooperation with other agencies.

As mentioned above, getting the approval of the Environmental Commission is a requirement for the completion of any business' registration or permitting process. This fact, along with the efforts of the Commission to develop an Environmental Management Document, is complementing the responsibility of the Investment Commission and the Land, Infrastructure and Services Commission to guarantee a sustainable future for the ASEZ.

2.2.3 The Land, Infrastructure and Services Commission

The many duties of this Commission are divided between its three directorates —the Physical Planning Directorate, the Public Works Directorate, and the Real Estate Directorate. The Commission is responsible for planning sustainable economic development of land and resources within the Zone; monitoring and implementing land development to satisfy and reflect policies set by the Board and development requirements; ensuring that infrastructure construction projects are executed according to approved plans, within time schedules and authorized budget levels; keeping records of ASEZA's assets and answering the increasing demands for the disposition of land property in ASEZ; administering the issuance of building permits and monitoring the compliance with building occupancy requirements; assuring the proper maintenance of the physical plant, public rights-of-way (including street lights, furniture, and signage), public facilities, parks, and open spaces under the administration of ASEZA; and maintaining the Geographic Information System database and the integrity of mapping and land use information. The Commission is also responsible for assembling and maintaining statistics on the demographics and economy of the ASEZ, and finally, providing essential public services, including solid waste management, cultural programs, slaughterhouse, pest control, cemeteries, building cleaning, and civic events/festivities.

One of the most important achievements of the Land, Infrastructure and Services Commission for the year 2003—and an essential element for implementing a full integrated coastal zone management system—is the adoption of a new Land Use Plan for ASEZ. This new master plan will provide the broad framework that will help upgrade opportunities for the development of existing built-up areas, provide new opportunities for resort and residential development, encouraging environmental, historical and recreational tourism, reconcile the needs of light and heavy industry with other uses, improve the effectiveness of the Port of Aqaba, and protect the unique environmental, historical and cultural resources. ASEZA is now strengthening its role in physical planning and development in order to effectively implement the Master Plan and achieve its objectives.

2.3 The Land-Use Plan

In 2003, ASEZA adopted a new Master Plan (Figure-8), a comprehensive vision that defines long-term development strategies for the growth of ASEZ. The Plan establishes goals and policies to sustain coordinated development throughout the area with respect to land use, zoning, density, circulation, utilities, environmental protection, and design guidelines to simplify and streamline the planning approval process.

The new Master Plan removes development barriers and encourages investment in industrial and port

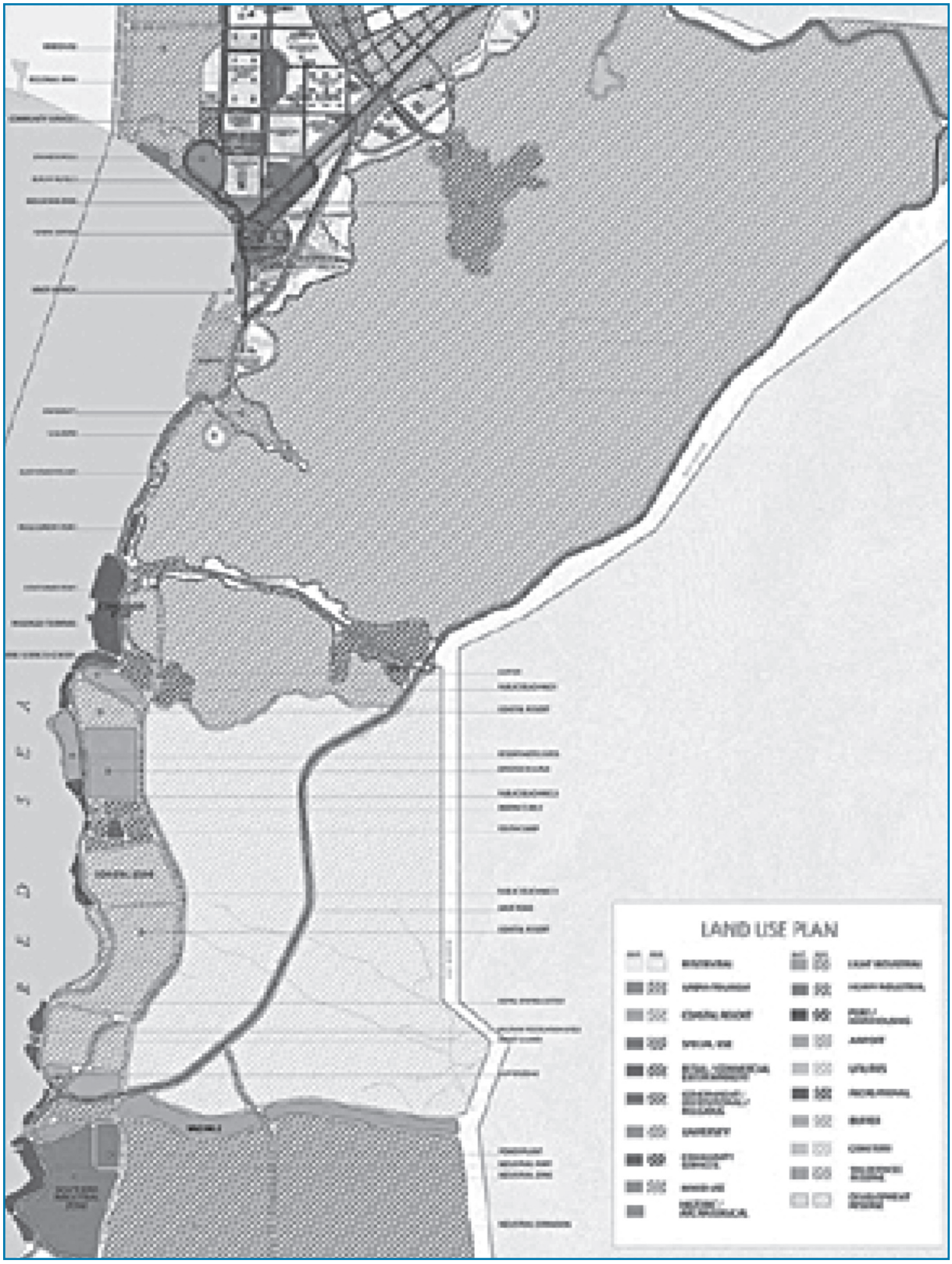


Figure-8: 2003 Adopted ASEZ Master Plan

activities, urban tourism, residential development, commercial and retail ventures, academic and institutional development, coastal communities, recreational and open space facilities. To date, detailed planning has been developed in five special areas: Aqaba Town, the Port Areas, the Coral Coastal Zone, the Southern Industrial Zone and the Airport Industrial Zone.

1. Aqaba Town

Aqaba Town is envisioned as the heart of the ASEZ's future tourism and commercial development. Key existing landmarks of Aqaba Town include: the waterfront; Al Hafayer, Mamluk castle, and the Great Arab Revolt Plaza; the Ayla archaeological site; the tourism hotel district; the town center; old Town and Shallalah; as well as newer residential areas. Future development will focus on revitalizing Aqaba Town to create a vibrant center for tourism, entertainment and commercial development, built around an enhanced center of cultural and historical features. The concept will be centered around the development of a Corniche, which will have striking and immediate impact—both visually and economically—on the development of Aqaba Town and the ASEZ.

2. Port Areas

The redevelopment and expansion of the Port will be another cornerstone of the ASEZ's future development, enhancing Aqaba's transportation assets while improving opportunities for tourism and commercial development. Each of the main port areas will be redeveloped and /or expanded. The container port and industrial port will be expanded and some activities will be relocated. The general cargo operations in the main port will be relocated over time to the Industrial Port and the area will be redeveloped towards tourism use, including a cruise ship and fast ferry terminal, mixed-use hotel, retail, entertainment and residential development.

3. Coral Coastal Zone

Aqaba's other key tourism and residential development zone will be located in the southern Coastal Area, which includes Aqaba's coral reefs, the Aqaba Marine Park, the Marine Science Center, the Royal Diving Club and public beaches. Planning and development focus on minimizing the currently fragmented development parcels, protecting the beach and coral reefs, while encouraging private sector development to transform Aqaba's Coral Coastal Zone into a new resort community with a new marina, residential development, hotels and entertainment facilities.

4. Southern Industrial Zone

A natural mountain buffer separates the coastal tourist area from the Southern Industrial Zone. The Southern Industrial Zone is located adjacent to the border with Saudi Arabia. The Southern Industrial Zone is the key development center for Aqaba's heavy agrochemical industries. The area will be expanded for future development while, at the same time, enhanced to improve the overall image of Aqaba by reducing air pollution and eliminating the gypsum waste pile.

5. Airport Industrial Zone

The airport Industrial Zone, in addition to forming a strategic arm of Aqaba's transport hub, will become the center for light industrial and warehousing development for the ASEZ. The former Free Zone Corporation sites will be consolidated; the airport will be expanded and will provide direct runway access to cargo and warehousing operations.

In addition to these five development zones, the Matter Plan includes designated environmental zones to protect and preserve natural areas and locations of historic and cultural significance:

- Coral Reserves: Three Coral Reserves protect the best coral reefs along the Coral Coastal Zone. These reserves extend from a line 350 meters out into the water from the mean water line to a line 50 meters inland from the mean water line.
- Beach Protection Zone: The Beach Protection Zone limits development in an area from 50 meters to 150 meters inland from the mean water line to natural landscaping and certain recreational facilities. These limits protect the natural environment, water quality and health of the coral reefs.
- Archaeological Reserves: Archaeological, historical and cultural reserves protect and buffer significant sites of cultural importance. New archaeological discoveries and their preservation are important to Aqaba's attraction as a tourist destination.
- Natural Area Reserves: Natural Area Reserves protect mountain areas, scenic ridgelines, upper valleys, and desert areas that have significant views or habitats.

Aqaba offers a wide range of unique natural and historical resources that enhance its physical environment and provide new opportunities for economic development.

Continued assurance of this unique environment is a fundamental principle of sustainable physical development in the region.

Figure-9: Environmental Resources Reserves

Chapter 3: The ICZM Approach of ASEZA

3.1 The Integrated Management of ASEZA

The semi-centralized administration setup of ASEZA and its broad and diverse responsibilities and authorities allow for an integrated and comprehensive management setup for almost all its actions/investments. This integrated management is mostly obvious through two of the most important processes in ASEZA, namely the Registration and the Permitting processes.

3.1.1 The Registration and Permitting Process

Whoever wishes to conduct any economic activity in the Zone and wishes to benefit from the incentives offered by the ASEZ Law and the Zone's duty-free privileges and exemptions, must apply to the authority for registration as a registered Enterprise and before conducting any activity allowed within the Zone (refer to Appendix 1) should apply and be granted a permit. These two processes allow ASEZA to comprehensively study and assess any project before permitting or denying it.

ASEZA has established a simplified registration and licensing process through an investor One-Stop-Shop window where investors can even establish new legal Jordanian entities through the representative of the Ministry of Industry and Trade present at the ASEZA investor One-Stop-Shop. The outcome of this process is granting/denying the investor all or any of the necessary Public Safety, Health, Environment and operational permits, approvals and requirements. Investors can also obtain all necessary forms for requesting land, work, visa and residency permits for foreign labor from the Investor Integrated One-Stop-Shop.

The Permitting Process Figure-10.a starts by filling out and submitting an Investment Facilitation Form. This requires the applicant to provide general information about the enterprise, a description of the proposed activities and facilities, capital, workforce and proposed dates of operation. ASEZA will provide the applicant with all the necessary permitting requirements within 14 working days of receipt of the Investment Facilitation Form. Depending on the information provided in the Investment Facilitation Form and the nature of the activity ASEZA provides the applicant with all the necessary permitting requirements.

Through the One-Stop-Shop, and after a comprehensive study of the Investment Facilitation Form and the other supporting documents submitted, ASEZA's Environmental Planning Directorate assesses the environmental impact of the project according to the provisions of the Environmental Protection Regulation and decides whether the project is :

- Exempted from environmental clearances and hence granted an Environmental Clearance Certificate through which the investor is allowed to proceed with the project, provided he fulfils all other permitting and building requirements.
- Requires a preliminary environmental evaluation aimed at providing a comprehensive understanding of the nature of the project and the scale of possible environmental impacts. The Environmental Planning Directorate will provide the investor with the requirements of the preliminary environmental impact evaluation.

- Requires a comprehensive Environmental Impact Assessment (EIA). This assessment aims at scientifically identifying the potential impacts on the environment, and the possible mitigation and monitoring measures to be taken to minimize any possible adverse environmental impacts.

The environmental requirements are considered part of the Permitting Requirements and in cases where the activity is subject to an Environmental Impact Assessment, the result of the study shall be considered as a fundamental factor in determining the environmental Technical Requirements of the Facility which is granted the Permit. The investor services will also advise an enterprise on the need for facility inspections and will arrange for the appropriate teams to inspect the premises. Upon successful completion of inspections, ASEZA will issue the necessary certificates and permits.

3.1.2 The ASEZA Land Disposition Process

This process, shown in Figure-10.b is another example of the integrated management approach adopted by ASEZA. The diagram illustrates the land disposition process which starts at the Investment Commission's Real Estate Management Division where the applicant files an application for renting or purchasing a particular parcel of land, in accordance with the Infrastructure Commission's Directorate of Land & Real Estate procedures on the relevant lease or purchase contract form. The application is then thoroughly reviewed by ASEZA's Land Committee which, depending on the financial, legal, environmental, and social matters of the project, recommends to the Board of Commissioners the rejection or approval of land allocation. The Board of Commissioners then affirms or rejects the recommendations and the investor is notified. In the case of approval, the application is then processed by the Directorate of Land and Real Estate which is responsible for lease renewals, land registration, monitoring tenant compliance and property condition, and rent collection.

3.2 Consultation, Participation, and Public Awareness

Through representation by NGOs, community leaders and the private sector, the general public has been involved in ASEZA's process of policy formulation and management activities. Such participation has been encouraged at the early stages and the preliminary planning of the ASEZ Master Plan through a strategic Environmental Impact Assessment, when public hearings were held in Aqaba as well as in Amman, to inform the public and obtain their support on the ASEZA proposed Master Plan and developments. Their demands and concerns were valued and later translated into the solutions recommended by the Master Plan. Since then, participation, consultation, and public awareness have been ongoing tools adopted by ASEZA'S Aqaba Marine Park Management to support and complement ASEZA's adopted integrated coastal zone management approach. To reduce fragmentation and duplication in planning and management of the coastal zone, ASEZA has also made efforts to coordinate between all involved governmental agencies, the Glass Boats Association, the Fishermen Association and the hotel owners, to efficiently utilize Aqaba's waterfront and to preserve the environmental uniqueness of its land and sea.

While the ASEZA is ultimately responsible for environmental protection and health control, there were a number of operational activities that could be outsourced to the private sector or outside agencies. For this, and in line with ASEZA's policy to maximize private sector participation and to streamline the activities of the ASEZA, a number of activities are currently either already outsourced or are being considered for outsourcing. Following is a summary of some of these activities:

- **Industrial Monitoring and Audit.**

It is expected that various industrial units within the ASEZ will perform regular assessments of their own environmental performance based on a specific inspection and reporting regime to be developed by the Environment and Health Control Commission in con-

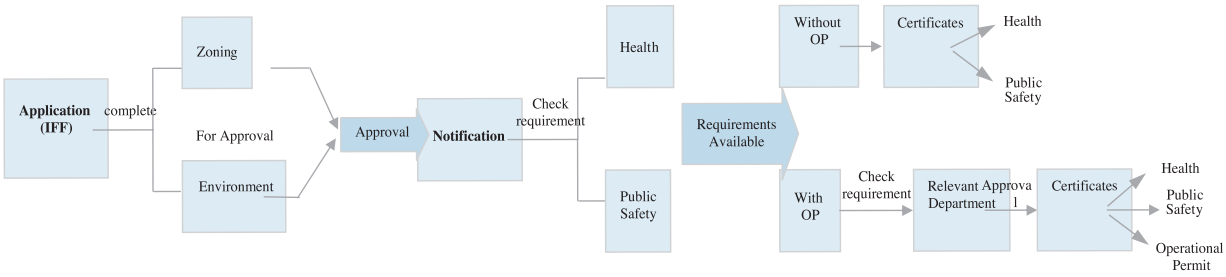


Figure 10.a: Registration and Permitting Process.

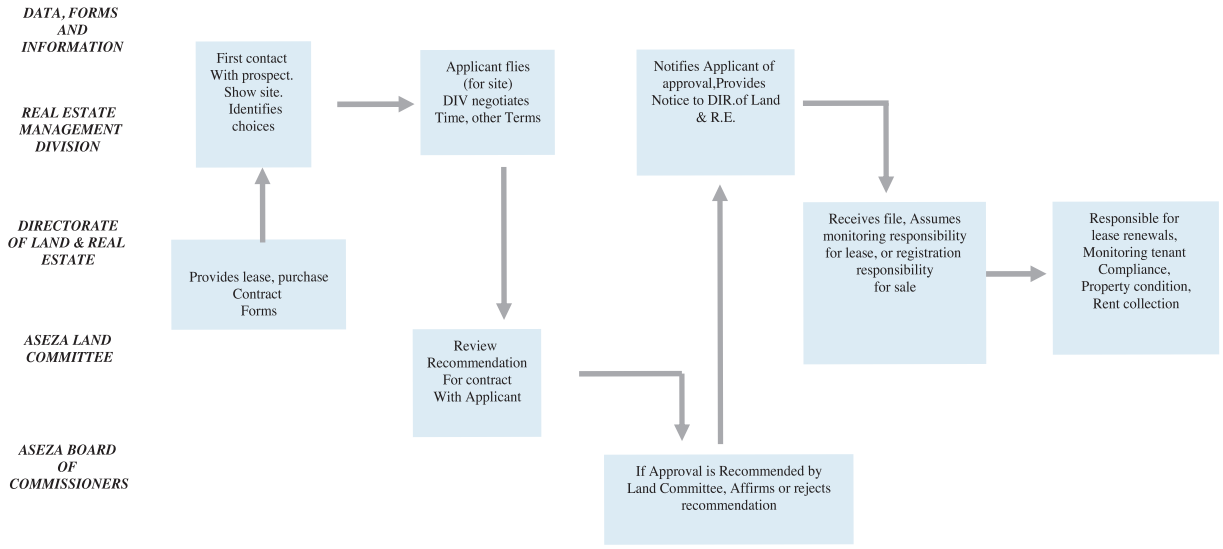


Figure 10.b: Land Disposition Process

junction with each industrial unit. While the Commission will assess the results and perform independent checks, occasional commissioning of external agencies to perform independent audits of specific industrial units may be required from time to time.

- Development of Standards and Codes

Specialist advice on the development and/or amendment of specific codes may be outsourced, although the responsibility for assessing, developing or amending codes and standards remains with ASEZA.

- Environmental Permitting and EIA

While the Environment Commission staff will have the general expertise required to assess environmental information provided by investors in an EIA, external specialist advice may occasionally be utilised.

- Environmental studies and Monitoring

The acquisition and analysis of data for environmental monitoring (marine water, air and groundwater quality) may be outsourced to other agencies. The monitoring of the marine environment is already being carried out by an external agency. Similarly, some aspects of air and groundwater quality monitoring could be outsourced. Nevertheless, it will be important to develop and maintain in-house capabilities in all these areas, particularly for emergency sampling in the event of a pollution incident.

- Education and Public Awareness

The design and implementation of public relations and public awareness campaigns may be outsourced to experienced agencies.

- Aqaba Marine Park and Wadi Rum

Currently the management of Wadi Rum is carried out by ASEZA and some of the activities that may be outsourced include handcrafts shop and other services. Currently, the Aqaba Marine Park is managed by a manager who reports to the Director of Environmental Compliance within the Environment and Health Control Commission. The Marine Park is a semi-autonomous unit with its own law and regulations and there is potential to outsource some park services such as the visitor's center.

- Slaughterhouse

The operational running of the slaughterhouse is currently the responsibility of the DMSPW. Given the commercial scope of slaughterhouse activities, its privatization should be considered.

- The National Oil Spill Contingency Plan

In 2002 ASEZA and the Port Corporation adopted an oil spills contingency plan to protect the northern tip of the Jordanian coastline, to preserve the Southern Nature Reserves and the tourist beach, and to prevent the spread of oil spills towards Saudi Arabian waters or the western coastlines of the Gulf. (Refer to Appendix-2)

ASEZA has made significant steps in the development of the Aqaba Marine Park Project (AMP) by commissioning a series of park infrastructure facilities (visitor center, jetties, first aid stations, etc) and by passing of strong legislation that is a key to effective park management and the enforcement of rules and regulations. ASEZA also succeeded in gaining broad public support for the AMP by (1) informing and educating the public about the proposed values of the park, and by (2) involving the community of resource users in the management of the park, including the collection of resource information and visitor use data, preventive enforcement, dissemination of information to other resource users, resource monitoring, and reporting of incidents. ASEZA, through the AMP, has also promoted the collection of information and scientific data that will support policy and management decisions. It has also built the institutional and human resources capacity needed for adequate management of the protected areas.

3.3 Environmental Monitoring and Analysis

A key component of the Environment and Health Control Commission's responsibilities is the development of a database of knowledge of the environmental resources in the zone. The ASEZ was created to promote investment and a significant proportion of that investment will be in the tourism sector. Therefore, even on purely economic terms, the existing environmental resources of the zone need to be maintained, protected and improved.

The division of Environmental Studies and Monitoring has overall responsibility for the establishment and implementation of regular and irregular environmental monitoring programs and studies in the zone. While some monitoring activities are in place, there are several key areas of environmental monitoring and analysis in which the Environment Commission will need to upgrade its capabilities, particularly in the areas of marine resources, air quality and groundwater quality.

- Marine Resources

Currently, the ASEZA has an annually renewable contract with the Marine Science Station (MSS) to provide regular monitoring and analysis of a number of parameters related to marine water quality, fish and corals. A number of additional marine water quality sites are required, both onshore and offshore, in order to build up a complete picture of the marine environment, particularly in the port area and at the Southern Industrial Zone. Also, the degree of analysis and interpretation of the data is currently inadequate and there is a need to improve the handling and storage of data through modeling and data interpretation.

- Air Quality

The establishment of a program to monitor ambient air quality in various parts of the zone is essential. There is significant industrial activity at the Ports and in the Southern Industrial Zone, and more light industrial activity is planned at the industrial estate to be developed near the airport. While the burden will be on each industrial unit to monitor and report its own emissions, the Environment and Health Control Commission will regularly inspect each establishment for compliance with environmental standards. The Department also needs to have baseline information on ambient air quality in order to monitor trends and establish long-term cumulative effects of industrial emissions.

- Groundwater Quality.

Likewise, up-to-date and reliable information on groundwater resources is required. The Environment and Health Control Commission intends to develop and implement a groundwater monitoring program which will be particularly important in light of the planned industrial and tourism development within the Zone.

In addition to the development and upgrading of monitoring programs, there is a need to continue gathering up-to-date assessments of the state of environmental resources in the ASEZ, including landscape, coastal features, corals, flora and fauna. This assessment will be used as a baseline for the management of the Zone's environmental resources, as well as the determination of the impact of various industrial and tourism activities on these resources.

Chapter 4: Recommendations

After reviewing the development of Integrated Coastal Zone Management in Aqaba during the Aqaba Region Authority era and its successor the Aqaba Special Economic Zone Authority, a set of lessons can be drawn to be applied to similar ongoing projects in the region, and a set of recommendations can be proposed to improve existing ICZM practices in Aqaba.

4.1 Lessons Learnt

- Any coastal zone should be recognized, at the policy-making level and the community level, as a valuable national resource in need of efficient management before the start of any ICZM project. This recognition should provide the legislative framework and community support with which ICZM can be enforced.

- Integrated Coastal Zone Management should be promoted as an efficient mechanism to resolve the problems encountered during the development of a multi-use coastal zone such as Aqaba. This will provide the support to policy makers and the encouragement to all stakeholders to conduct and comply with any ICZM instructions.

- Although ASEZA is yet to formally adopt an ICZM program, the essential integration processes at the internal and external levels are in place. The successes accomplished as a result are proof that the ICZM process can start ahead of its formal adoption.

- In a multi-use coastal zone there will definitely be some tradeoffs between environmental resources protection and economic growth. Ongoing monitoring of the marine environment and the collection of statistics on recreational, industrial and port activities are key elements for mitigating potential impacts and tradeoffs. This must be an integral part of any coastal protection and management process.

- The main ICZM tools, illustrated in this report and used at present by ASEZA, such as the Aqaba Marine Park, the EIA Process, the Permitting and Registration Process, Community Participation, and the Land Disposition Process, proved to be successful tools to achieve the goals and objectives of an environmentally-aware economically-driven authority.

4.2 Recommendations and Improvements

1. Because of the expected increasing pressures on the fragile marine habitats within the next several years due to increasing tourism and industrial developments, ASEZA should formally prepare and implement an Integrated Coastal Zone Management Process, and invest in itself and staff so as to be able to mitigate impacts from the very beginning to avoid having to play the catch-up game faced by many authorities over the world.

2. It is important that ASEZA follows its newly adopted Land-Use Master Plan with a corresponding Water-Use Plan. One single plan, formally approved and adopted by the Board of Commissioners, that illustrates the allowed Land uses

alongside water uses is needed to assure the implementation of a wider vision plan for developing the Gulf of Aqaba. This would be a further step towards achieving full integration.

3. ASEZA should conduct an assessment of the carrying capacity for the entire coastal zone to alleviate some existing environmental threats, to maintain the balance between economically feasible development and adequate marine environment protection, and to limit and prevent overloading the coastal zone with industrial and tourism activities.

4. ASEZA should continue to improve the environmental monitoring programs it has and at the same time initiate regional monitoring programs for the Gulf of Aqaba as a whole. Computer models which could provide simulations of tidal and wind-driven currents, sedimentation processes, dispersal and movements of industrial and sewage effluents, dispersal and effects of marine pollution incidents and ground water levels, are tools that require transboundary coordination to achieve an efficient management and protection of the Gulf.

5. ASEZA should continue to strengthen its public awareness and education programs to reach out to the communities and stakeholders at all levels. It should continue with the development of public beaches to provide all necessary infrastructure, services, demarcation and buoys installation, and a good signage system that would help maintain public safety and manage beach activities and uses.

6. ASEZA should consider the establishment of a Coastal Rangers Unit to facilitate the compliance with the law by any user.

7. ASEZA should establish an air-monitoring program for the purpose of obtaining continuous and reliable air pollution measurements. Furthermore, an ambient air-monitoring program should be initiated as soon as possible by ASEZA in coordination with other regional stakeholders to ensure the right response depending on the results of monitoring.

8. Finally, there are several areas in which environmental and health standards have not yet been fully established. ASEZA should outsource this task or internally develop required standards such as: Standards and Requirements for Food Production and Control, Emission Standards, Solid and Hazardous Waste Management Standards, and Occupational Health Standards.

Finally, it is important to point out that this set of recommendations should be seen as only a preliminary exploration of what needs to be done and should serve as a basis on which an action plan put by ASEZA should be formalized to further study and implement these recommendations.

Appendices

Appendix 1:
Activities Subject to Operation Permits

The following activities are subject to the Operation Permit required by the Authority:

- Distributing medicine and medical, veterinary and pharmaceutical products.
- Distributing fertilizers, growth stimulators and pesticides.
- Distributing hazardous chemical material.

- Medical and therapeutic services and institutions, including:
  - Hospitals and medical centers.
  - Nursing and rehabilitation centers.
  - Infirmaries, disabled and natural therapy homes.
  - Mineral springs spas.
  - Medical and physiotherapy centers.
  - Physicians and dentists clinics.
  - Optics stores.
  - Medical and dental laboratories.
  - Manufacturing and distributing fireworks.
  - Hotels and motels.
  - All types of recreation cities.
  - Scuba diving and water sports clubs.
  - Marine and land zoos.
  - Tourism and travel offices.
  - Nurseries and private childcare centers.
  - Driving learning schools.

- Tourist transportation in the Zone.
- Taxi and transportation offices.
- Washing and greasing stations.

Animal (livestock) and poultry production facilities.
Aquatic cultivation and fish farms.
Stables and pet farms.

- Quarries.
- Water extraction from wells.

- Industrial activities.
- Public utilities activities, the performance of which the Authority grants the private sector.

Activities that are granted an Operation Permit by the Authority in coordination with the relevant bodies in the Customs Territory

- Marine transportation services.
- Air transportation services.
- Communication services.
- Elementary, secondary and higher education.
- All aero-recreational sports and aviation instruction.

- Mining and other extraction industries, except quarries.
- Issuing newspapers and periodicals.
- Programming and radio and television transmission services.
- Public utilities activities, the performance of which the Authority grants the private sector.

Appendix 2:
Excerpts from the National Oil Spill Contingency Plan

Objectives

Protecting the northern tip of the Jordanian coastline beginning at the Royal Palace and hotel area to the northern coral community located between the Royal Yacht Club and the Main Port area.

Protecting the Southern Nature Reserves and the tourist beach.

Preventing the spread of oil spills towards Saudi Arabian waters or the western coastlines of the Gulf.

General Policy

Priority is given to preventive actions in correlation with prevailing regulations and instructions. The curative actions and recovery operations of the spilled oil shall take place by natural, manual and mechanical means. Approved dispersants and alternative means are to be used only when necessary.

Prince Hamzah Oil Spill Combating Center (PHOSCC) is equipped to prevent long-term environmental damage from small to medium-sized spills up to approximately 200m3 of oil.

The northern part of the Gulf is populated, narrow and rich in marine life. An oil spill occurring anywhere in this area of the Gulf will quickly reach the surrounding vulnerable coastal areas. It is very difficult for any single country to control and prevent the oil spills from reaching its own marine environment without regional coordination and cooperation.

Responsibilities

Coordination:

To coordinate work in combating oil spills and define the roles of each party ASEZA and the Port Corporation (TPC), both parties agreed and signed a Memorandum of Understanding (MOU)

Assessment, Surveillance and Monitoring of Spill Risk:

As long as no oil tankers call at the Port, the expected frequency and size of spills are the result of marine traffic, operations, or/and accidents that occur in the northern part of the Gulf. The spills are unpredictable and are not expected to exceed 200-300 tonnes of oil.

The main types of oil transported or used by vessels navigating in the Gulf are crude oil, heavy fuel oil and diesel fuel oil, gas oil, mineral oil and vegetable oil.
The Port has no reception facilities for oil contaminated bilge or ballast water.

Tankers with a cargo capacity of 100,000 to 150,000 tonnes of crude oil are calling at Eilat (Israel), discharging some 3.5 million tonnes of oil per year.

Oil pollution in the Port can be classified as follows:

1. Small to minor spills (0-20 tonnes) caused by the accidental or intentional release of oil contaminated bilge or ballast water from commercial vessels.

2. Medium spills (20-200 tonnes) caused by the spill of oil during oil bunkering operations.
3. Major spills caused by the rupture of a bunker oil

tank in a bulk/cargo vessel collision (200-500 tonnes); shipwreck of a bulk/cargo vessel (1500 tonnes).

Climatic Conditions and Oil Spill Movement in the Gulf:

The overall course of a slick is primarily dependent upon the climatic conditions and the physical characteristics of the oil, i.e., specific gravity, distillation characteristics, viscosity and pour point. Local boats and crafts shall be used for monitoring the oil slick.

The Gulf is enclosed and gentle winds coming mostly from a northerly direction generally initiate only modest wave action. The annual average of tidal change is 0.2-0.5 meters, with the highest sea level occurs in late winter, and the lowest occurs in late summer. In the Gulf about 95% of the wind speed is between 5-10 m/sec and the prevailing current speed is between 0.15-0.30 m/sec parallel to the shoreline.

If an oil spill occurs near the main Port, and the northern wind speed is 10 m/sec, and thecurrent speed is generally assumed to be 3% of the wind speed, which is equal to 0.30 m/sec (excluding the special effects of waves, other currents, etc.), the current will cause the oil spill to drift toward the south. It will take about 6 hours for the oil spill to reach the protected coral reefs area located to the south of the Passenger Terminal (approximately 6.5 km from the main Port). In fact, it will only take 3-4 hours. This estimate is a very important factor in choosing the most suitable equipment and its location.

Combating spilled oil means a race against time. Considering the time factor and the special natural factors governing the Aqaba coast, in addition to the movement of minor/medium size oil spill, the speed of the oil drift, the location of the environmentally sensitive areas, the distance from PHOSCC, the availability of trained personnel, the time needed to reach the spill area and the time needed to deploy the oil booms to protect the target areas is 3-4 hours. It will be easy to believe that the oil drift towards the environmentally sensitive areas is probably faster than the combating teams action, thus the combating team's mission will be changed from protecting these targets to rescuing them, and from a short and quick containment and recovery operation to a slow and long lasting beach cleanup operation.

To face the above problem, some adjustments are needed, suggesting the following:

1. It is the role of ASEZA, TPC and NGOs to increase the public awareness and the participation of the private sector coastline enterprises in protection of the adjacent sensitive areas and public beaches. By having their own oil deflection booms ready for use against oil spills.

2. Relocating PHOSCC, from its current location to an intermediate location close to the Container Port area will reduce the needed time for action from 3-4 hours to 1.5-2 hours.

3. Increase the number of persons trained on oil spill combat operations.

Protection

Starting from the Jordanian-Israeli border toward the north, the beach is sandy with relatively shallow waters. The area between the Royal Yacht Club and the Main Port area is a shallow area and represents the remainder of the most northern coral community in the Gulf. This area is close to town and is partly used as a glass bottom boat harbor. It has significant natural and touristic values and deserves to be protected and environmentally managed.

The northeastern part of the Jordanian coastline south of the glass bottom boat marina is known as the port area and includes the Main Port, Phosphate Berth, Rice, Cement, Container and Passenger Terminals.

South of the port area and along the middle part of the coast (Middle or Tourism Development Zone) extends a semi-continuous, actively growing and exceptionally productive coral reef. The Marine Science Station Nature Reserve represents the northern boundary of this zone.
The southern coastal strip extends about 5 km from

the Royal Navy location to the Saudi Arabian border; the shore is rocky with cobbles or similar with less sand. This strip accommodates many industrial enterprises that including the Oil Terminal, Aqaba Thermal Power Plant, Jordan Phosphate Mining Company Fertilizer Plant and Arab Potash Industry storage and loading facilities. Special care should be given to all related water intakes.

All shallow lagoons and coral reefs flat areas may be endangered in the event of considerable oil spills (minor – large). Therefore, it is important that preparations are undertaken to provide enough booms that could protect the reef flats from oil during a spill.

Deflection booms should be set up that would aid in the deflection of any oil that is being transported along the shoreline by currents into deeper water.

The following table shows the areas, which are designated by ASEZA as potential sensitive areas in the event of an oil spill and demand high priority protection:

Combating

No.	High priority in southerly wind	High priority in nourtherly wind
1	North Beach (Hotels and Amenity area)	Marine science station and northern nature reserves.
2	Royal Yacht Club	Southern Coral Reef area
3	Al-Hafayer area	Industrial water intakes.

Maintaining oil pollution combating equipment available in TPC including type, dimensions, capacity, transport requirements, and storage location.

The beach area between the Container Terminal and the floating berth (Alyarmouk) has been identified as a "sacrificial area" to which spilled oil may be deflected for the purpose of containment, recovery and shoreline cleanup. Whenever needed, ASEZA/the Committee shall designate new sacrificial areas.

Logistic support: Arrangements for the provision of food, protective clothing, shelter, and medical support are available locally within the organizational structure of TPC.

Immigration & customs: ASEZA is responsible for arrangements with immigration to issue immediate necessary approval and visas on request. ASEZA will also issue immediate necessary approval and clearance for equipment utilization from abroad in case of a joint response between Jordan and any neighboring country. The Chief Commissioner or the Commissioner of Environment shall carry out the necessary arrangements and contact with the Immigration Department for necessary approvals.

Public relations/Media Liaison Officer: Any major oil spill attracts the public's attention. Reporters will arrive at the scene from a variety of news media. ASEZA/the Committee shall provide all necessary up-to-date factual statements to the news media available at the time of the spill, and whenever necessary and possible. The information released should include facts relating to: what happened, when, where, casualties, equipment damaged and any technical data such as the size of vessel, type of oil, port of departure, destination, etc.

Environmental Damage Evaluation

Areas affected by major spills should be subject to further ecological observation.

ASEZA/the Committee should consider the requirements of such observational activities at the time of the cleanup work.

In such cases, expert advice should be sought from local or foreign ecologists, biologists, etc, that have previous experience in this field.

Future costs resulting from such observation should be included as part of the cleanup costs.

Collected Material Disposal

Temporary storage and transportation arrangements for collected oil and oily debris is influenced by the final disposal method and the permanent storage locations.

A decision about these arrangements should be reached during the early stages of the cleanup operation.

Reports

PHOSCC shall provide and submit the following related technical reports to TPC Marine Manager and Head Office:

1. Upon completion of any oil spill combating and cleaning mission, a written accident report sheet must be filled out with all relevant information. The information should include, but not be limited to: name of oil spill source, type and quantity of oil, spill location, procedures and measures taken by source and by combating center, the elapsed time and reasons, difficulties and obstacles, manpower and equipment used, time used in combat, total cost of the mission, defected shoreline areas, efficiency of the mission and any relevant recommendations.
2. Upon completion of training and exercises missions, a written report sheet must be filled out with all relevant information such as, but not limited to: objectives, number and names of trained staff, trainers, equipment used for training, duration of training, actual cost of the training, evaluation and relevant recommendations. ASEZA shall receive a complete copy of the above-mentioned reports.

Training and Exercises

Local Training and exercises: Alarm tests, paper exercises, practical training and live drills for all staff and levels shall take place frequently, and according to a plan. There will be some surprise tests to ensure the readiness of personnel for equipment mobilization. Various people involved must be able to work as a team, and each should be familiar with all measures related to a combating process.

Regional training and exercises: This shall take place as per existing agreements between Jordan and neighboring countries.

External training and exercises: ASEZA and TPC shall consider the external training programs and conduct any relevant training or exercises.
- Al-Saifi, Sharif, The Aqaba Marine Park Management

Appendix 3:
List of Species in Aqaba Coastal Zone

Table: Marine Life in Aqaba Coastal Zone:
Source: National Environmental Strategy for Jordan report, 1991

Category	Groups included	# Species	Remarks
Algae	Cyanophta (blue –green), Chlorophyta (Green), Phaephyta(brown),Rhodophyta (Red)	71	
Sea Grass		3	threatened by disappearance due to sedimentation & navigation
Porifera	Calcarea, Hyalospongia, Demospongia, Scleerosponges	37	
Cnidaria	Soft and hard corals,Crinoidea (Sea lilies) & Water Corals	263	threatened because of uprooting & breaking by anchors
Worms	Nematoda (roundworms), Polychaeta (numerous setae), tapeworms	60	
Mollusca	Shells, Cephalopoda (cuttlefish, squids, octopus)	637	some are threatened by overharvesting
Echinodermata	Stellerroidea (starfish), Echinoidea, Holothuroidea, Crinoidea (sea lilies)	56	
Crustacea	Malacostraca (crabs, shrimps, lobsters)	200	
Fish		340	
Turtles		2	rare species, need protection
Mammals	Dolphins and dugong	5	rare species, need protection

Table 2: Quantities and Types of fish caught:
Source: National Environmental Strategy for Jordan report, 1991

Type*	Season	Fishing Technique	Quantities (tons)
Emperor	May-Aug.	Nets & Sakhawi	2
Tuna	Dec.-April	Nets	20
Sardine	June-Aug.	Nets	20
Bigeye	April-Aug.	Nets	.05
Siganus	April-Aug	Nets	2.5
Friden	April-Aug	Nets & Sakhawi	3
Mullet	May-Aug.	Nets	.05
Squirrel fish	May-Aug.	Nets	.05
Fusilier & Jack	April-Aug.	Nets	4
Other types, over 25 in number		Nets	4

** These fish are seasonal, except for the tuna, which are pelagic, and the bigeyes, the fusilier and the Jack, which are natives*

Table 3: Marine Birds (including Raptors):
Source: National Environmental Strategy for Jordan report, 1991

Common name	Scientific name	Common name	Scientific name
Rock Dove	Columba livia	Hony buzzard	Pernis apivorus
Collard Dove	Streptoplia decaocto	BlackKite	Milvus migrans
Palm Dove	S. seegalensis	Red Kite	M. milvus
Namaqua Dove	Oena capensis	Lammergeier**	Gypaetus barbatus
Ring-necked parkeet	Pisttacula Krameri	Egyptian Vulture	Neophron precnopterus
Little Owl	Athene noctua	Griffon Vulture	Gyps fulvus
Hume's Tawny Owl	Strix buteri	Black Vulture	Aegypius momachus
Desert Lark	Ammomanes cincturus	Sparrowhawk	Accipiter nisus
Hoopoe lark	Alaemon alaudips	Steppe Buzzard	Buteo lagopus
Rock Martin	Ptyonoprogne fuligula	Spotted Eagle	Aquila clanga
Sand Martin	Riparia riparia	Steppe Eagle	Aquila nipalensis
Yellow Vented Bulbul	Pyonotus xanthopygos	Hobby	Falcon subbuteo
Blackstar	Cercmela melanura	Lesser Kestrel**	Falcon naumanni
Wheatear	Oenanthe oenanthe	Sotty Falcon**	Falco concolor
Isabelline Wheatear	Oenanthe isabellina	Lanner **	Faloc biarmicus
Spanish Rosefinch**	Passer hispaniolensis		
House Sparrow	Passer domesticus		
Sinai Rosefinch	Corvus rhipidurus		
Desert Finch	Rhodospiza obsolta		
Fan-tailed Raven	Corvus rhipidurus		
Indian House Crow	Corvus splendens		

*** Regionally threatened*

References

Plan. Aqaba Region Authority. March, 2000

- Aqaba Special Economic Zone - A Strategic Choice for your Investment. 2000

- Aqaba Special Economic Zone Authority - Regulation No. (11) for the Year 2001: Regulation for the Development and Improvement of the Investment Climate for the Aqaba Special Economic Zone. Article (4)

- Aqaba Special Economic Zone Authority - Aqaba Special Economic Zone Law: Law no. (32) for the year 2000

- Clark, John R, Coastal Zone Management Handbook. 1995

- Clark, John R, Integrated Management of Coastal Zones. 1992

- COWI Consult, Aqaba Coastal Resources Environmental Management Study in Jordan. September, 1995

- EnviroConsult Office for Environment & Water Services, General Environmental Requirements for The Aqaba Special Economic Special Economic Zone. August, 2001

- International Coral Reef Initiative, Report of the Middle East Seas Regional Strategy Workshop . September, 1997

- Mann, Roy B, Coastal Zone Management Guidelines and standards for Tourism and Urban Development in the Aqaba Region of Jordan. October, 1995

- Metqaf & Eddy/Aqua Alliance, Development of a Comprehensive Environmental Management Program for the Gulf of Aqaba. November, 1998

- Ministry of Municipal and Rural Affairs, Department of Environment, National Environmental Strategy for Jordan. August, 1991

- Pearson, Michael, Assessment of Coastal Zone Management and EIA Procedures Applicable to The Aqaba Coastal Zone . June, 1999

- PERSGA, A Strategic Action Plan for the Red Sea and Gulf of Aden Country Report. 1998

- Sorenson, Jens C & McCreany, Scott T, Institutional Arrangement for Managing Coastal Resources and Environments

- The Hashemite Kingdom of Jordan, Gulf of Aqaba Environmental Action Plan. May,1996. GEF World Bank Document. Report No.10.15290 JO

- The Service Group, Inc.(Aqaba Technical Assistance Support Program), Aqaba Free Port Special Economic Zone Feasibility Study and Implementation Plan. Final Report-Volume 5. 1999

Sharing of ICZM Experiences-
Seeking Common Approaches:

Jordan Report on ICZM Experiences

PERSGA

The Regional Organization for the Conservation of the Environment
of the Red Sea and Gulf of Aden

Tel: +966 2 6573224
Fax: +966 2 6521901
P.O.Box 53662 Jeddah 21583 Kingdom of Saudi Arabia
e-mail: information@persga.org
www.persga.org

AQABA
SPECIAL ECONOMIC ZONE AUTHORITY

Aqaba Special Economic Zone Authority
P.O. Box 2565 Aqaba 77110 Jordan
Tel: +962 3 203 5757
Fax: +962 3 203 0912
email: info@aseza.jo
www.aqabazone.com

GEF UNEP UNDP