Jordan ICZM Country Report 2014

Towards Sustainable Coastal Zone Development

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This report is an updated version of the 2004 Jordan ICZM Country Report. It records, evaluates, and documents progress in ASEZA's coastal zone management approach, as well as highlights the status, trends, and threats in the Aqaba Special Economic Zone's coastal and marine environment. A set of recommendations and lessons learned are presented for a better coastal planning and management practice with aim to achieve sustainable coastal developments in Aqaba.

This document is a product of the Mainstreaming Marine Biodiversity Conservation into Coastal Zone Management in Aqaba - a GEF funded project implemented by the United Nations Development Programme (UNDP) and the Aqaba Special Economic Zone Authority (ASEZA).

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Mainstreaming marine biodiversity conservation into coastal zone management in the Aqaba Special Economic Zone Project

The goal of this project is to mainstream biodiversity conservation in order to promote more effective and integrated management of the coastal zone in the Aqaba Special Economic Zone. The strategy to achieve this goal has four primary components: development and improvement of knowledge-management systems for coastal and marine biodiversity, promotion of biodiversity friendly investment and development, improving institutional capacity for integrated coastal zone management and biodiversity conservation and coral reef protection.

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Acronyms

ACT	Aqaba Container Terminal
ADA	Aqaba Dive Association
ADC	Aqaba Development Corporation
AMP	Aqaba Marine Park
APC	Aqaba Ports Corporation
ASEZ	Aqaba Special Economic Zone
ASEZA	Aqaba Special Economic Zone Authority
AWWTP	Aqaba Wastewater Treatment Plant
CBD	UN Convention on Biodiversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
EU	European Commission
FMSC	Faculty of Marine Sciences
GAEAP	Gulf of Aqaba Environmental Action Plan
GEF	Global environment Facility
GOJ	Government of Jordan
ICZM	Integrated Coastal Zone Management
JPMC	Jordan Phosphate Mining Company
JREDS	Jordan Royal Marine Conservation Society
LPG	Liquid Petroleum Gas
MARPOL	International Convention for the Prevention of Pollution from Ships
MSP	Marine Spatial Planning
MSS	Marine Science Station
NGOs	Non-governmental Organizations
PERSGA	Regional Organization for the Conservation of the Red Sea and Gulf of Aden
PHOSCC	Prince Hamzeh Oil Spill Combatting Center
POPs	Persistent Organic Pollutants
RPA	Regional Programme of Action
SAP	Strategic Action Program
UNDP	United Nations Development Programme

1. Introduction

With its only 27km of coastline and a population of 103000 people living in the only coastal city and outlet to open sea, the Aqaba Special Economic Zone Authority (ASEZA) is facing the challenge of maintaining the balance between the economic developments in the newly established free tax investment hub special economic zone and the integrity as well as the sustainable exploitation of the coastal resources.

This challenge has manifested itself in the currently multi-sectorial coastal areas uses which has been overwhelmed by the size and capacity of activities that ranges from the very simple use of the coastal area to the most complex industrial and maritime, as well as to the supper high end scale sea resorts. In the process of finding and applying the most suitable approaches to plan and manage the coastal zone, this report comes to record evaluate and document progress in ICZM in Aqaba.

2. Reflections on the 2004 ICZM Country Report

The 2004 Jordan ICZM Country Report which was prepared by The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) through the Strategic Action Program (SAP) was an excellent document in terms of its contents and the list of recommendations made in order

Fig. 1 the Great Arab Revolt Plaza, Aqaba City

to enhance and strengthen ICZM approach in Jordan. The report represented a valuable assessment of the ICZM experience in Aqaba and provided a good account of the historical and existing situations along the coastal zone. The report has also included some good discussions on the ASEZA's approach to coastal zone management and planning. That approach was seen to be satisfactory and effective in the overall ICZM process applied by the local authority yet it did not reach the level of being fully comprehensive for instant for not addressing the water use side of the coastal zone.

In addition, the report assembled some lessons from the Jordanian experience, and made valid recommendations on how the process can be further improved.

3. The Aqaba Special Economic Zone Governance Modality

The Aqaba Special Economic Zone (ASEZ) was established in 2001 as a duty-free, low tax multi-sectorial development zone encompassing the entire Jordanian coastline (27 km), the seaports of Jordan, an international airport and the historical city of Aqaba. ASEZ is regulated by the Aqaba Special Economic Zone Authority

(ASEZA) which is in charge of managing, regulating, and providing municipal services within ASEZ. ASEZ is a private sector-driven development initiative that maximizes private sector participation in a duty free, tax-advantaged, and flexible regulatory operations environment providing a model approach to environmentally sustainable development and governance, a unique tourist destination on the Red Sea with a duty free shopping oasis accompanied with a high quality of life. According to the strategic plan 2001-2020, the zone targets 50% of investments in the tourism industry, 30% in a variety of services, 13% in heavy industry, and finally 7% in light industry.[1]

ASEZ is facing the pressures of economic growth of the region with the accompanying growth in population. As illustrated in Figure-2, Aqaba has grown since 1972 from a town of 10,000 to its current population of 103,000. The projected population for the year 2020 is 150,000. The growth depended on natural growth rates, levels of internal migration and external migration, mostly amongst foreign workers. ASEZA law allows for companies to have over 70% of their labor force foreign. [2]

4. The Institutional Arrangements for ICZM in ASEZ

Institutional and legal arrangements are very essential to the success of any ICZM program and one of its fundamental requirements. To be effective, ICZM should have a strong set of polices for planning and management of coastal environment and its resources. Such policies must be followed by appropriate legislations. In the case of ASEZ, the government of Jordan has given special attention for Aqaba city to ensure its strength as a lifeline of the Jordanian economy, and its only outlet to the open sea. Therefore special institutional setup and legal arrangements where structured for the zone in 2001 to delineate its administrative structure as well as stipulate the policies and regulations.

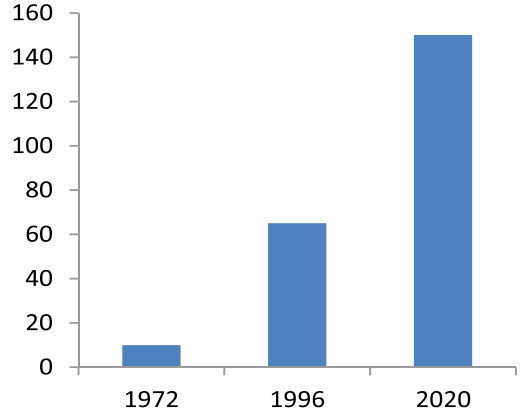

Fig.2 ASEZ Population Projection.

ASEZA is the financially and administratively autonomous institution responsible for the management, regulation, and the development of the Aqaba Special Economic Zone (ASEZ). ASEZA'S vision is to make of ASEZ a world class Red Sea business hub and leisure destination enhancing the quality of life and prosperity of the community through sustainable development and a driving force for the economic growth of Jordan.

ASEZA as the main institutional partner for ICZM is administered and supervised by the

[1] The Jordan Investment Board
[2] 2010 ASEZ Master Plan Updating Final Report)

"Board of Commissioners" representing 5 (in addition to the Chief Commissioner) complementary but independent commissions which are (Figure3):

i. Administrative and Financial Affairs;
ii. Customs and Revenue;
iii. Economic Development and Investment Affairs;
iv. Infrastructure and Services Affairs- Master plan;
v. Environmental Affairs- permitting-inspection.

Although the Environment Affairs Commission remains the leading entity within ASEZA for environmental management in ASEZ, other commissions have also an important role in supporting adherence to ICZM principles and their implementation in Aqaba.

4.1 ASEZA'S Integrated Management Approach.

The Aqaba Special Economic Zone Authority (ASEZA) provides its services in the zone in a one stop shop fashion in which all services are integrated, mainstreamed, and introduced in a very fast and swift way thus eliminating many steps in the business processes and delivered services in the zone. This integration is manifested on the following two levels:

a. At the institutional and legislative level, the semi-centralized administration setup of ASEZ 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.
b. At the implementation and practice level, the Registration and Permitting process for 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 should apply to get the permit. These two processes allow ASEZA to comprehensively study and assess any project before permitting or denying it.

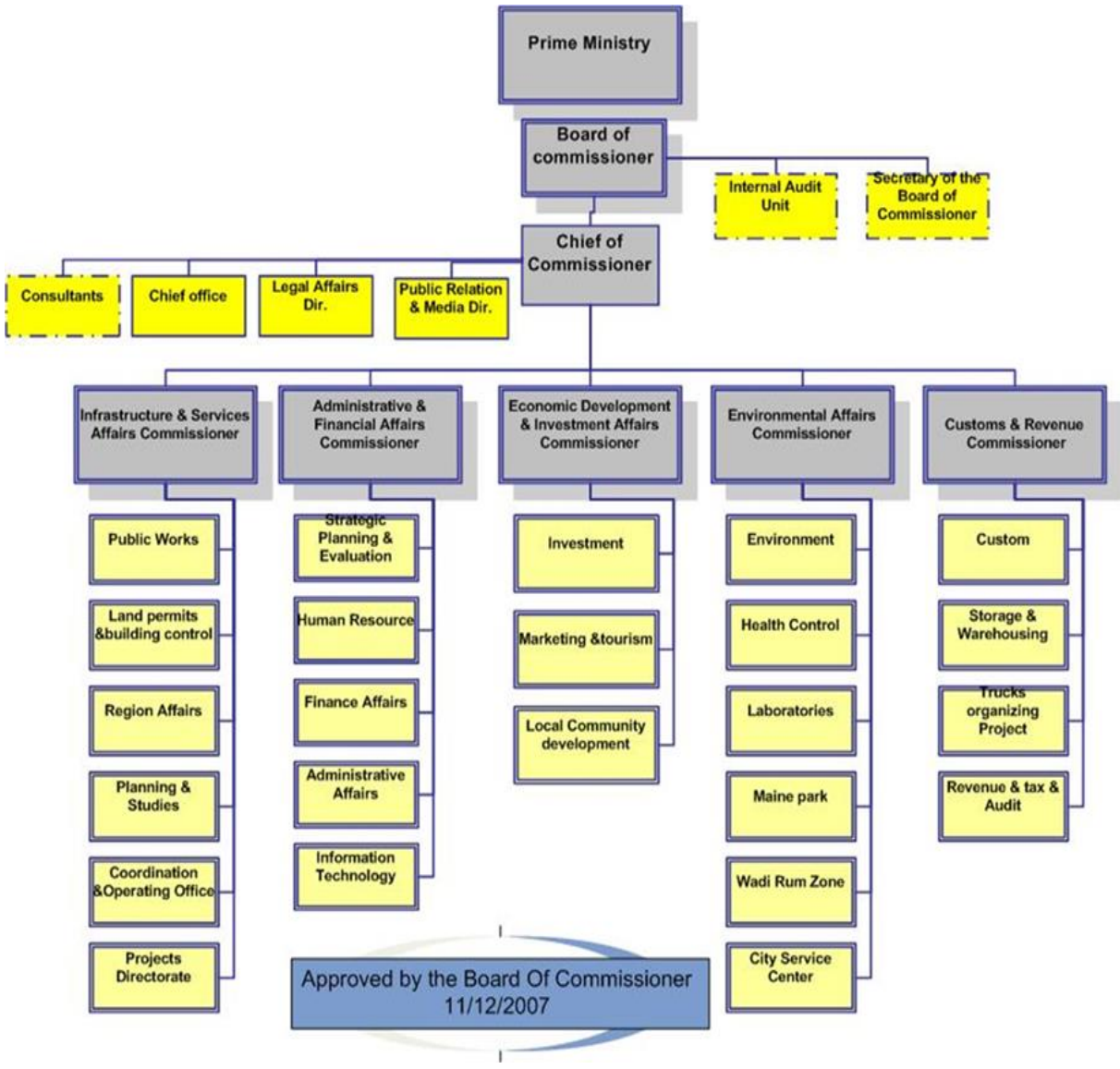

Fig. 3 ASEZA Organizational Structure.

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.

4.2 The Registration and Permitting Process

The registration and permitting process 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, 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 fulfills all other permitting and building requirement requires a preliminary environmental evaluation aimed at providing comprehensive understanding of the nature of the project and the scale of possible environmental impacts.

The Environmental Directorate provides the investor with the requirements of the environmental impact evaluation required by the regulations.

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 granted the Permit. The investor services offer also the advice to the enterprise on the need for facility inspections and arrange for the concerned team to inspect the premises. Upon successful completion of inspections, ASEZA will issue the necessary certificates and permits.

4.3 The Land Disposition Process

This process 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 fills in an application/form for renting or purchasing a particular parcel of land (in accordance with the Infrastructure Commission's Directorate of Land and Real Estate procedures).

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

responsible for lease renewals, land registration, monitoring tenant compliance and property condition, and rent collection.

4.4 The Existing Policy Framework for ICZM

A strong set of polices for planning and management of coastal environment and its resources are very essential for the success of ICZM. The legal framework for the establishment of ASEZA has supported the necessary policy for an effective coastal management system. Regulation No. 21 of 2001 for the Environmental Protection Regulations of ASEZA constitutes a strong regulatory basis and ensures pollution control and environmental impact assessment. A zero discharge policy to sea has accordingly been adopted; large development projects within ASEZA's mandate which can may have potential negative environmental impacts are all subjected to detailed environment impact assessments. Penalties are imposed on any environmental damage caused by these development projects as well in case such damage occurs.

4.4.1 The National Laws and Guidelines

The empowering legislation is the Aqaba Special Economic Zone Law for the Year 2000 (No. 32) and its amendments. The legislation consists of 58 articles that cover all necessary aspects in ASEZA. Environmental protection was further strengthened with the ASEZ Environmental Protection Regulation No. 21 for the year 2001. This regulation requires that all existing and potential investors within the zone satisfy the Authority with regard to environmental effects and their capacity to comply with all the relevant environmental requirements, rules and instructions within the zone.

This regulation provides the overall basis for the environmental policies in ASEZ and lists a number of prohibited acts regarding waste management, use of sea water, and emission of harmful substances to the environment. The regulation addresses the legal framework for environmental management and monitoring in the zone including environmental clearance and post-clearance phases of the economic activities in the Zone. The regulation also details appropriate measures to prevent environmental pollution and protect the marine resources, and sets out a legal framework for the imposition of penalties for pollution incidents.

4.4.2 International Agreements Related to ICZM

Jordan is a signatory to the following international treaties and conventions which are of relevance to the protection of the costal and marine resources:

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.

Table 1. Effective Regulations in ASEZ.

National Laws and Regulations	Year Enforced	Government Agency Concerned	Updating and current status
Laws of the Aqaba Special Economic zone No 31	**2001**	**Aqaba Special Economic Zone Authority**	**effective**
Law of Environmental Protection No. 12	1995	**Ministry of Environment**	**effective**
Jordan Specification Standard No. 893	1994	**Water Authority of Jordan**	**effective**
Port Services Fees Law No. 20	**1987**	**Ports Corporation**	**effective**
Jordan Specification standards No. 202	1982	**Water Authority of Jordan**	**effective**
Agricultural Law, No. 20	**1973**	**Ministry of Agriculture**	**effective**
Aqaba Port Quarantine Law No. 32	**1972**	**Ports Corporation**	**effective**
Shipping Law No. 51	**1961**	**Ports Corporation**	**Effective**

2. The Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matters (London Convention1972) 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 regulates 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 substance, 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,1992). Jordan declared its territory as forbidden to the importation or transshipment of foreign hazardous wastes.
7. The United Nations Convention on Biological Diversity (CBD 1994). The convention requires 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.

In conclusion, the legal setup and administrative framework of ASEZ remains the same as far as environmental control and ICZM planning and management since the embellishment of the zone back in 2001. However, there has been a significant change in the structure and mandates of ASEZA with respect to customs control and operation in the ASEZ where the ASEZ's special customs body are no longer exist within ASEZ and it has been replaced by the national customs.

5. ICZM Approach Applied by ASEZA

Despite of its success in controlling of what goes in the land and into sea, the current joint land and sea management approach applied by ASEZA is still lacking the formal adoption as well as the legal framework for holistic management of the entire Jordanian Coastal Zone at the Gulf of Aqaba.

With the exception of the Aqaba Marine Park (AMP) where the management of the 7km coastal zone is relatively joint (land and Sea), the rest of the coastal areas within ASEZA jurisdiction is sectorial management. This type of management is seen successful by some ICZM experts as long as the ICZM overall goals are mainstreamed in the existing governance system.

Although ASEZA's ICZM approach is a non- integrated option yet, ICZM goals in

Aqaba are being to some extent achieved within the existing framework and processes as seen in the land disposition and registration and permitting process - explained above- which could be referred to as an example of this type of ICZM practice.

5.1 Most Faced Challenges

Though the ASEZA has successfully managed for the past 10 years to maintain considerable balance between the economic growth in the zone and the integrity of the marine resources, as well as coastal system, there are still some major outstanding challenges facing the current ICZM approach in Aqaba. The key challenges include:

5.1.1 Institutional and Legal Challenges

- The lack of a policy statement which defines the general goals and directives of ASEZ's coastal zone;
- The current adopted national laws and regulations by ASEZA with regard to marine environment and coastal resources need updating and revision to allow for holistic management of the entire coastal areas;
- ICZM as a process has to be institutionalized as a formal process within ASEZA institutional setup and structure.

5.1.2 Environmental Challenges

This type of challenge is associated with threats from construction related activities in the coastal zone, e.g.:

- Land based activities
- Petro chemical and industrial activities.
- Solid waste.

5.1.3 Public Awareness and Consultation

Public awareness and consultation are still not yet tackled by ASEZA in a comprehensive and measurable manner.

5.1.4 Economical Pressure and Scarcity of Lands along the Coastal Zone

The narrow strip of the coastal zone in Aqaba and the geographical limitations are a challenge facing ASEZA optimal use of the coastal lands.

5.2 ICZM Consultation, Participation, and Public Awareness in ASEZ

General ICZM programs require a high degree 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.

Jordan has achieved good progress with regard to consultations and the earlier attempts has been made in 1990 when the government proposed the establishment 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 and aimed at that time to at gaining the public support and to engage them in the decision making process.

The current approach with regard to public awareness and consultation at ASEZ is progressing. Substantial improvement and increasing level of public participation in ICZM as well as more consultation among

stakeholders are taken place more than before.

The current UNDP Project "Mainstreaming Marine Biodiversity Conservation into Coastal Zone Management in Aqaba" has made a recent and significant contribution towards enhancing public awareness of the importance of coastal and marine resources and promoting the active role of the public in the implementation of conservation initiatives and activities. This has been made through the development of the first Communication and Public Participation Strategy for Conservation of Costal Environment and Marine Biodiversity in Aqaba in addition to the implementation of several publicity activities and events to develop the awareness in the public opinion of the significance of the marine environment and the need to conserve it as a vital resource for tourism, fisheries, scientific research and the intrinsic values of a pristine marine ecosystem.

The objectives of the new Communication and Public Participation Strategy are:

- Publicizing and promoting "Conservation of Costal and Marine Environment" in Aqaba;
- Raising awareness among stakeholders and encouraging their participation in conservations initiatives and activities;
- Changing public's thinking and behavior in relation to particular issue (e.g. destructive fishing, collecting coral pieces, littering...etc.).
- Informing public about Aqaba Marin Park and its role and achievements as well as any changes in regulations or management activities within its boundaries.

The Strategy is currently under the process of official adoption by ASEZA and other related stakeholders. It is expected that actual implementation of recommendations and activities included in the strategy by the end of 2014.

5.3 The Aqaba Marine Park (AMP)

Marine Parks and Marine Protected Area (MPAs) as well as the protection of certain species and their habitats play an important role in any ICZM program, and it is the most important aspect of biodiversity maintenance.

In ASEZ's ICZM approach, the importance of this component to the ICZM overall goal was recognized at an early stage of the ICZM cycle. Accordingly, the establishment of the Aqaba Marine Park (AMP) was at the first steps of the ICZM practice in ASEZ. The establishment of the AMP was derived by the rapid urban development and the economic activities which lead to increase in the population in Aqaba city. The increasing pressure on a rich, but limited, coastal resources of the Jordanian portion of the Gulf of Aqaba has led to 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 levels. Located south of the city of Aqaba, the protected area of the AMP was created to conserve and manage the natural near-shore marine environment of the Aqaba's south coast region with its rich biodiversity, while allowing for certain touristic uses at sustainable levels, for the benefit and enjoyment of the present and future

generations of Jordanians and the global community.

The park is an entity under the Environmental Affairs Commission. The Park currently employs 46 staff; however, the park staff is overwhelmed with different functions which do not allow it to focus on the "conservation mandates" entrusted to the Park.

The prevailing conditions within the AMP have accordingly driven the AMP management team to work in a reactive mode, to respond to constantly rising pressure on the park's resources, rather than setting a strategic and adaptive approach to address the threats on the park. This has also incurred an extensive pressure on the human resources of the park and resulted in heavy turn-over of the staff, due to hardship conditions and lack of needed incentives at the administrative level to respond to extensive workload.

Fig. 4. Public beach at the AMP.

The marine park is actively collaborating with other several institutions that have mandate (part of their mandate) relevant to ICZM. Among these institutions are:

- The Marine Science Station;
- The Faculty of Marine Sciences in Aqaba;
- The Royal Marine Conservation Society of Jordan (JREDS);
- Royal Department for Environmental Protection (Environment Police);
- Hotels Association of Aqaba;
- Fishermen Cooperative Al Thagher.

5.4 ASEZA'S Coastal Planning Process

The current coastal planning process applied by ASZA is fully dependent on the General Master Plan of ASEZ and its mapping which includes land use plan, environmental constrains as well as beach protection zone. This process has been effective in defining what goes in the dry side of the coastal zone, yet the sea side is still a challenge to ASEZA, there has been some mapping of some marine resources such as the fringing coral reef stretch along the marine park, and some bathymetric maps of some part of the Jordanian Gulf of Aqaba, but such initiative remain in stand-alone project mood and not fully integrated with the overall policy of what and how should ASEZA plan and manage its sea use unless otherwise a sea use plan is in place. Nevertheless, the master planning process of ASEZA is considered one of its most important tools in land use planning and management. As a decentralized local government, ASEZA is empowered to exercise planning, regulating, and spending, in addition to

taxing and land acquisition powers in the ASEZ.

The Aqaba Special Economic Zones (ASEZ) land use master plan was prepared in 2001. The vision has been to project developments in the zone for the year 2020. Extensive studies and thorough analysis were conducted at the time of launching this economic zone. Supported by many international agencies including, ASEZ's land use master plan data collection and analysis began with reviewing and analyzing the existing situation in the Aqaba area which was administered by the former Aqaba Region Authority (ARA) before 2001. The goal was to define the best development scenarios for the new established economic zone.

Transforming the city of Aqaba into a special economic zone was a paradigm shift in the southern port city toward a free tax open market economy in Jordan.

5.5 The ASEZ General Land Use Master Plan

The 2001-2020 ASEZ General Use Master Plan which was adopted by ASEZA in 2003 is considered by the as a comprehensive vision that defines long-term development strategies for the growth of ASEZ. This 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. Moreover the Plan removes development barriers and encourages investment in industrial and port 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. The development objectives for this land use master plan were derived from the following points:

1. An analysis of the existing conditions, the development issues and the proposed projects;
2. A review of the previous master plans and development studies in ASEZ;
3. Strategic workshops and focused groups consultations.

One key development objective of the land use master plan was to relocate the main port operations to the southernmost of the zone. This relocation will allow for effective operation, and expand tourism potential on the city water front as well as reduce adverse impact on the Aqaba Town coastal water.

Another stated key objective of the land use master plan was to coordinate land use relationships and identify opportunities for urban growth, as well as protect and enhance environmental resources that attract tourism and business, and finally give an image to the city of Aqaba by integrating architecture and landscaping design and effective property management and maintenance.

5.6 The Spatial Policy of ASEZ'S Land Use Master Plan.

The spatial policy which was adopted by ASEZA in developing the master plan was based on the philosophy of maximum and optimal use of the lands in the zone. This was interpreted in giving "services divisions" scenarios where 50% of development is for tourism oriented projects and services, while 7% was allocated for Heavy Industries, 13% for light industries and 30 % for services and ports operation. The urban and residential part of the city was allowed to expand naturally up north. While some gated communities was allowed in southern coastal zone. This form of urban growth have led to satellite communities that are not close to each other where the notion of compacted or smart growth city with close nodes to create the scene of a " community" was not an alternative back then. This pattern of spatial distribution of development required a lot of capitals to build roads networks and utilities to serve such scattered satellite communities, which at the end increased the burden to carry the cost of such infrastructures on ASEZA and its development and investment arm the Aqaba Development Company (ADC). Moreover, there were a lot of redundancies in the infrastructure systems, which to some extent were increasing risks in the urban areas of ASEZ.

5.7 The Sea Use Planning System in Jordan

In general, Sea Use Planning or Marine Spatial Planning (MSP) has been a crucial step in making ecosystem –based sea use management a reality during the past 10 years. This participatory approach of integrating planning and management of the use of the sea and its resources can both save the environment and facilitate economic development as well as allow for compatibility between land use and sea use. In the case of ASEZ, the planning and zoning and administrative responsibility of the sea side of the coastal zone is lying under the jurisdiction of the ASEZA. It also has the legislative power to act as the authority that is responsible for the sea use planning and management in integrated fashion.

ASEZA and UNDP Jordan are currently preparing the sea use master plan for the entire coastline of Aqaba as part of the current project "Mainstreaming Marine Biodiversity Conservation into Coastal Zone Management in Aqaba". It is envisaged to produce such a plan by the end of this year, and it should be compatible with current land use plan.

6. Assessing ICZM Progress in ASEZ

ICZM is a multi-layered activity including practical implementation, institutional strengthening, governance frameworks, etc. Possibly because of this complexity; there have been very few attempts to assess the outcomes of the ICZM process in Aqaba. Nevertheless and despite the lack of quantifiable indicators and measures of progress, a review of activities to date indicates that ICZM's progress towards achieving sustainable coastal development in ASEZ is still at a relatively immature stage.

However, immature implementation of ICZM is not a unique case of Jordan. Among the nearly 700 initiatives in ICZM that have been initiated in 140 countries since 1965 – 2005, only half of them fully implemented the plans.

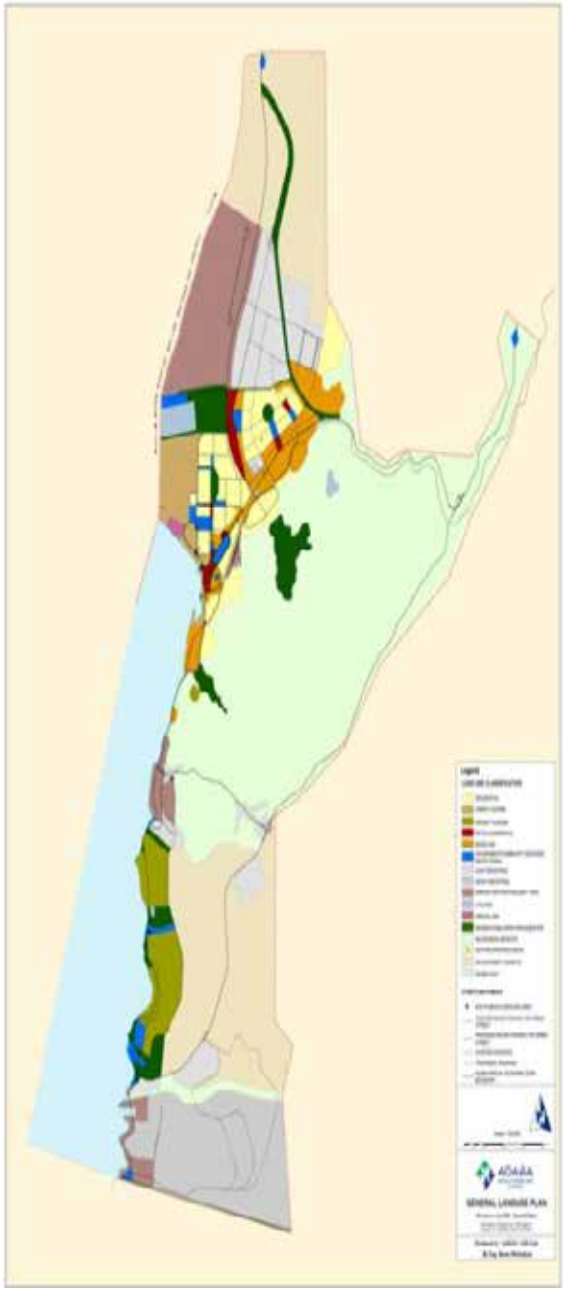

Fig.5. ASEZ Land use Master Plan

It is globally acknowledged that more effort is needed in improving the monitoring and evaluation practices for better implementation of ICZM.

ICZM is an evolving process that is subject to the constant change of the communities and environment in which it functions. Hence the established monitoring and evaluation system should be adaptive; indicators are used as valuable tools that can reflect this change, and allows us to observe the effects of ICZM.

There are no such a blueprint of ICZM indicators that fits all. Among the most internationally well recognized efforts in this regards are the following examples:

1. The UNESCOO Handbook - A Handbook for Measuring the Progress and Outcomes of Integrated Costal and Ocean Management.
2. The European Commission (EU) ICZM indicators.

Currently the ASEZA'S ICZM approach is not fully equipped to meet the challenges which are facing ASEZ in the coming years due to the increasing pressure on the coastal resources as a result of the increasing economic pressure and rising population. These situations are expected to rise exponentially due to upcoming and future projects in the Jordanian coastal zone.

To move towards the fourth order of sustainable coastal development in the ASEZ, a number of critical barriers must be overcome, including:

- the short-term, stop-go nature of the individual projects based on the project funding cycles that has led to a loss of essential continuity and capacity;

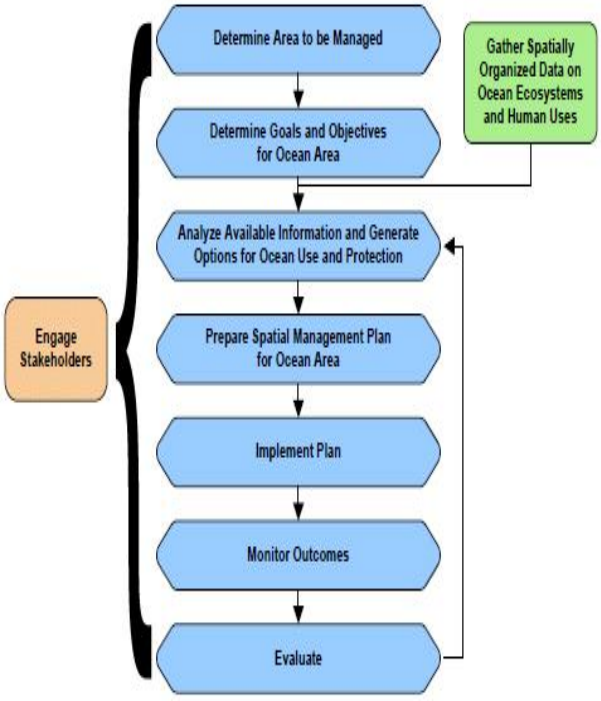

Fig. 6. Process of Sea Use plan development.

- The relentless and overwhelming pace of development along the coast that has led to a gap between the rapid, exponential rate of development with its consequent environmental degradation, and the capacity of ICZM to deal with it i.e. the development-management gap.
- The stubbornly persistent perception of ICZM as an environmental management activity - a pressing need exists to embed ICZM into other areas of policy;
- The still patchy and inconsistent enabling frameworks for national capacity building and regional actions such as awareness-building, that takes place in parallel and often behind local action;
- The obvious lack of synergy between programs, and projects which are implemented at ASEZA and funded by donors such as USAID, EU, UN etc.
- The relatively poor public visibility of ICZM projects;
- The need to re-assert ICZM as the powerful arbiter it is between the land and sea issues and interests;
- The over-long time cycle to produce local ICZM action.

If ASEZA wants to achieve the fourth order of outcomes (sustainable coastal development) this requires not just a substantial increase in the level of ICZM activity around the coastal areas, but significant changes in the culture of the activity and its ability to adapt and work with an ever-changing policy background.

In general, existing ICZM guidance in the ASEZ and other regions is predominantly environment-led and can appear pre-occupied with the impacts of tourism and the management of habitats and eco-systems; much space is devoted to assurances that ICZM is 'not incompatible' with social and economic objectives, but with little real attention to integrating these objectives. In addition, the guidance available is becoming dated as the last decade has seen a overabundance of international agreements on the environment, pollution, poverty reduction,

health, climate change and other issues. "ICZM hasn't yet captured the policy and practice high ground its proponents would wish and lacks apparent and contemporary relevance to politicians and other key decision makers".

Maritime spatial planning is seen as a key tool in moderating competing between marine and terrestrial uses and interactions. ICZM practitioners will need to be able to work closely with, and use maritime spatial planning as a tool, and be familiar with use of the Strategic Environmental Assessment (SEA) and other spatial planning tools.

7. Stakeholders and Developers Identification in the Coastal Zone

The transformation of the City of Aqaba into a Special Economic Zone was aiming at promoting economic developments through a set of incentives given by ASEZA to investors and developers to encourage investment in the zone. Despite the fact that ASEZA is the institution with regulatory, planning power, yet it shares the responsibility of developing the coastal zone and protecting the marine environment with its partners and key stakeholders, those major key partners are as stated bellow:

- **Aylah Oasis Development Company**

A mega project located at the western border of the Aqaba City with a total area of 4.5 million square meters, a 250 meter water front, and total investment of 1.5 Billion USD. The project has a man – made lagoon with a total area of 750.000 square meters. This lagoon will add an extra coastline of 17 km.

developmental demands. In the ASEZ coastal waters, spatial planning process and systems have just been initiated; however, it is likely that they will steadily improve in the coming years, with stronger mandatory requirements specific to each of the land and marine environments. ICZM has an important role to play in this process, in particular in moderating

Fig. 7. Aylah Oasis.

- **Saraya Holdings**

The project was lunched at the World Economic Forum held at the Dead Sea in May 2005. Located at the western part of the northern beach coastal area with a total land area of 634 donums with a total investment of 1.4 billon USD, and adding approximately 1.5km of beach front to the Gulf of Aqaba. The project covers approximately 634,000 square meters of master planned development combining hotels, shopping, dining, entertainment, cultural activities and freehold residences.

- **Al Maabar Company**

The 3.2 million square meters site of Marsa Zayed project stretches over half o the downtown area and includes 2km of

prime waterfront offering high-rise residential towers, expansive retail, recreational, entertainment, business districts, several branded hotels and several marinas. The built-up area of the project is more than 6 million square meters. Expected completion date of phase one will be by 2015.

ASEZA is yet to solve a number of issues in this area related to fragmented patterns of land ownership/private owner ship, and destruction of palm trees. Perhaps this coastal area is one of the most controversial issues that ASEZA is faced with at the present time.

Fig. 9. Middle Beach Area.

- **The Main Port Area**

The redevelopment and expansion of the ports 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

- **Al Hafayer Area (the Middle Palm Beach Area)**

This area extends over approximately 2.2km with an area of approximately 32 dunums the major natural elements consist of: sandy beach, extensive palm tree plantation, agricultural plots, and historical significance - Al Sharif Hussein Castle.

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. The main port of the city will be turned to beach front leisure facilities with an investment totaling 10 billion USD (Marsa Construction at the new port site is ongoing and full operation is planned for 2016.

Fig. 10. The Main Port.

It is envisaged that such redevelopment will increase the beach front for recreational, and tourism activities at the heart of the city of Aqaba. Moreover, this relocation will eliminate the phosphate dust problem that the city of Aqaba has been facing.

- **Middle Ports Area**

From 2004 till 2012 the middle ports area have be going through an extensive developments and upgrading to accommodate the high demand on containerized shipping.

In 2006 the Aqaba Development Company (ADC) revised the middle port area Master plan with an aim to boost development and increase the capacity of the ports in the meters of draft. An extensive terminal expansion project, due for completion at the end of 2013, will nearly double berth length to 1000m and increase capacity to 1.5 million TEUs (twenty-foot equivalent unit).

Fig. 11. The container Port.

- **Mo'ta Berth**

A floating berth of 150 meters long and 35 meters wide. The depth alongside is 20 meters. Mo'ta Berth is positioned north of the Container Terminal and serves the rice processing plant. It can accommodate vessels up to 40,000 DWT (Deadweight tonnage).

- **Yarmouk Berth**

Designated to serve the ferry line between Aqaba and Nuweibi, Egypt. The 150 meters floating berth has a draft of 9 middle ports area. The container ports as well the industrial ports in the middle ports area are under improvement and expansion at this time and some activities will be relocated.

- **The Aqaba Container Company (ACT)**

ACT is situated on the south coast of the city. The terminal currently accommodates vessels up to 540 meters long and 18 meters and can also be used for Ro-Ro ships.

- **The Industrial Port**

Nearly all industrial ports of ASEZ are located at the southern industrial Zone.

The southern industrial zone is located adjacent to the border with Saudi Arabia. It is the key development center for Aqaba's heavy agrochemical industries. The area has been expanded to accommodate most of the petro chemical factories as well as the industrial Ports and jetties.

Fig. 12. The Industrial Port.

In addition to the above, there are number of other jetties and berths located along the coastline; Oil Jetty (150m length, 24m draft, receives oil tankers of up to 406,000 tons displacements), timber berth (80m long, 7m draft; receives 14,000 tons

displacements vessels as well as livestock handling) and cement berth (a dolphin berth, 120 meters in length and11 meters deep alongside, equipped with a conveyor belt capable of handling 5,000 tons a day dedicated to cement exports and vessels up to 70,000 DWT).

- **Airport Industrial Zone**

Located at the northern part of ASEZ with direct access by the Dead Sea Highway, The airport Industrial Zone, in addition to forming a strategic arm of Aqaba's transport hub, has been the center for light industrial and warehousing development for the ASEZ. The airports will be expanded and will provide direct runway access to cargo and warehousing operations.

- **The King Hussein International Airport (KHIA)**

KHIA Operates under a recently signed "Open Skies" agreement allowing great flexibility for both passenger and cargo operations.

8. The South Coastal Zone (Eco-Tourism Zone)

Aqaba's key tourism and residential development zone has been located in the southern tourism coastal area, this area is currently known as the eco-tourism area and includes the Aqaba Marine Park, the Marine Science Station, the Royal Diving Club and the public beaches. Planning and development focus on minimizing the currently fragmented development parcels, protecting the beaches 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. Some of the undergoing developments in the coral coastal zone are:

- **The Beachfront Promenade.** This promenade extends along the inland 50 meter setback zone of the Aqaba Marine Park. The main goal of this development is to facilitate Beach access for the public as well as to protect the beach protected zone.
- **Upland Eco-tourism Residential Gated Communities. This includes:**
  - the Red Sea gated residential and sea resorts facilities**;**
  - Seascape gated community villas and apartments;
  - Bernice Beach Club**;**
  - Barracuda Diving Center**;**
  - Tourism Services and Diving Clubs area.

Plans are underway to realignment of the coastal road were more inland will be added to the west side of the road. This realignment is expected to add more land to the backshore area of the marine park, thus, expanding the park's terrestrial boundary landward, and increasing the area designated as a public beach.

Fig.13. South Coast Tourism Area Zone

In addition to the above mentioned five development zones, the master 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 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 waterline 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.

Fig.14. Environmental Constrains Map.

9. Other key Players and Stakeholders

Aqaba Development Corporation (ADC)

ADC was established at the beginning of 2004 as a private corporation jointly by ASEZA and the Government of Jordan. It acts as the central development body for the ASEZ. Ownership of Jordan's ports, the city's international airport and strategic parcels of land, as well as the development rights for these assets and key infrastructure and utilities is now held by ADC. ADC's objectives are to develop and manage these strategic assets to unlock and leverage value from this asset base. A key priority for ADC is to ensure that the 2001 – 2020 Master Plan for the zone is implemented in a systematic way that maximizes the potential of Aqaba as a leading Red Sea business, logistics and leisure hub.

ASEZA has signed an agreement with ADC to meet a number of requirements for environmental protection, especially and specifically with regards to the operation of the sea ports and the airport, and all other lands under ADC's control. Among these requirements for instant, the development of Ports Environmental Protocol which includes a baseline assessment of the environmental status of the ports, as well as an environmental action plan outlining the procedures and resources required to address and deal with environmental issues and problems at the ports and on lands owned by ADC, such as oil waste disposal, oil spill containment waste disposal, firefighting, storm water management, dust control, and undertaking generally to improve environmental and safety standards and to operate on best practices. These protocols are still under preparation.

Jordan Maritime Commission[3]

Shipping in Jordan is regulated by the Maritime Commission. Its purpose is to regulate, control and develop the maritime sector in Jordan including all maritime transportation modes and the related labor forces. It holds the three aims of efficiency - achieving the highest performance standards, protection of the marine environment and enhancing the maritime safety and security. The commission is responsible for the inspection and regulation of shipping, ship movements, ship safety, and records. While the commission has a role in the regulation of on board equipment, the role of the environmental regulation with regard to pollution in marine environment and coastline lies with ASEZA.

Royal Jordanian Navy

The Royal Navy has the most active presence in policing the environmental performance of marine vessels operating within the Jordanian waters. The Navy conducts daily patrols of port areas and keeps a patrol boat on 24-hour watch in the ship anchorage area next to the main port. The Navy, in collaboration with the Ports Corporation, assists in preventing polluting discharge from ships and helps bring the polluters before the courts. The Naval Base is located between the Marine Park and the Southern Port area.

Faculty of Marine Sciences (FMSC)

Faculty of Marine Sciences (FMSC) was established in 2010 and located on the road to King Hussein International Airport on the northern side of the cit. The faculty has B.Sc. program that is comprised of two separate administrative units, the Department of Marine Biology and the

[3]Protecting the Coastal and Marine Environment from Land-Based Activities National Programme for Action

Department of Coastal Environment in addition to a recently established master program in marine science. The faculty is administratively belongs to the University of Jordan.

Marine Science Station (MSS)

MSS was established in the 1970's and linked to the University of Jordan and Yarmouk University. Its objectives include monitoring coral reef ecological trends and providing facilities for training and research. Since its foundation, the MSS has conducted baseline research on coral life, marine water quality and the impacts of selected pollutants on the marine environment. MSS is also responsible for operating the marine aquarium and managing the strictly preserved Coral Reserve No. 1. MSS conducts a monthly seawater quality and marine life monitoring program for ASEZA.

Royal Society for Conservation of the Marine Environment (JREDS)

JREDS is a non-governmental organization, established in 1995 to contribute to the conservation and sustainable use of the marine resources in Jordan through advocacy, education, outreach and empowerment. JREDS carries out regular beach and underwater cleanup programs, organizes community awareness and public education programs. In coordination with other NGOs and programs, JREDS has taken part in coral reef monitoring, turtle surveys, water conservation and other environmental campaigns in Aqaba such as litter reduction.

The Aqaba Dive Association (ADA)

Currently, there are seventeen dive centers operating along the Aqaba Coastline. All diving activities must be conducted through licensed dive operators and a guide must accompany all divers. All diving activities are to be carried out in a safe and responsible manner to accepted international standards such as CMAS, BSAC, PADI, or NAUI.

The Aqaba Dive Association (ADA), registered as a NGO, is an industry body concerned with providing dive site access to its member organizations and both local and international tourists. The ADA is comprised of professional diving centers located in the ASEZ. ADA members have considerable dive-industry experience and institutional knowledge of the coral habitat in the area and as such are a potential source of experienced, knowledgeable personnel and information feeds for the monitoring and evaluation system of the project.

10. Environmental Threats

ASEZ coastal areas are still facing a number of environmental threats which in most cases are land based and industrial related. However, significant progress and improvement have been made in the system with respect to environmental monitoring activities.

With regard to air quality for instant, there are currently two fixed air monitoring stations installed to give air quality indications. Moreover, the phosphate dust is no longer a problem since the terminal at the main port has been relocated to the new phosphate jetty within the southern industrial zone.

ASEZA has improved its seawater quality monitoring programs in coordination and collaboration with the Marine Science Station. The frequent nature of continuous projects at the coastal zone has demanded the ASEZA to act systematically, and in conjunction with the undergoing projects in the coastal zone. The following summarizes the main threats facing the Aqaba coastline. Further analysis on these

threats and the overall of the state of coastal environment will be included in the "State of Coast" report which is being prepared nowadays as part of the activities of the "Mainstreaming Marine Biodiversity Conservation into Coastal Zone Management in the Aqaba" project.

10.1 Coastal Constructions Related Threats

It had been estimated that 30-50 % of the coastline has been altered by coastal constructions. This includes man-made lagoons, roads, ports, marina, power plants, factories and cooling water outlets.

The north coastline has been going through a lot of alteration during the last 5-7 years due to the dredging and shoreline construction and excavation of three man-made inland lagoons and marina for Ayla, Srayah and Royal Palaces. However, all these projects have been screened and EIA was required from ASEZA prior to commencing of construction phase in addition to requesting some protection measures to be taken into consideration to prevent adverse impact into the marine environment.

- Fertilizer related chemicals

Some accidental spills could take place during 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 industrial complex pose a risk to the environment.

The 30,000 ton on-site Ammonia storage tank (cooled Ammonia at –32°C) is another health and environmental hazard.

- Potash Storage Facility

The potash storage capacity of the Aqaba Potash Company (APC) in Aqaba was recently expanded from 160,000 tons to 260,000 tons. The Aqaba facilities are among the most efficient and modern in the Potash industry. The reclaiming system ensures physical uniformity, guarantees reduced segregation and prevents caking. Deducing, oil treatment and new screening units are installed to remove any fine particles and to reduce dust emissions during loading vessels at rates up to 1000 tons/hr.

10.2 Industrial Related Threats/Chemical and Thermal Threats

- Fertilizer Plant

The Jordan Phosphate Mines Company/Industrial Complex (JPMC-IC) produces 740,000 tons of Di- Ammonium Phosphate (DAD) and 270,000 tons 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.

- The Aqaba Thermal Power Plant (TPP)

The Aqaba Thermal Power Plant (TPP) is located in the south-western border of Jordan, approximately 22 km south of the town of Aqaba and 1 km from the beach. The plant site is some 35 meters above sea level and located in the middle of an industrial area. It consists of five steam turbines units.

The company is keen to continue its efforts for maintaining environment conditions and upgrading its level in all activities. In this regard, the power station has been registered as a clean development mechanism (CDM) project in (UNFCCC) on October 7th, 2008. Such registration will qualify the project to sell carbon reduction emissions (CERs) in the international market to Annex I countries granting considerable benefits to Jordan.

The TPP which is a 260MW station uses 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.

- Phosphate Dust from Port Activities

According to official reports, 3.5 to 6.4 million tons of raw phosphate are exported through the Gulf of Aqaba. Phosphate dust generated during ship loadings considered a serious environmental problem in Aqaba due to 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.

Phosphate loading and unloading terminal have been relocated from the north main port to the south industrial zone .This shall eliminate the phosphate dust impact on the city of Aqaba and the nearby coral reef communities.

10.3 Other Threats

- Solid Waste

The municipal services in Aqaba are taken care of by Aqaba Special Economic Zone Authority (ASEZA). The solid waste management services are being awarded to a private sector (Clean City Company) on a contracted basis with KPIs. The services include:

- Street sweeping, pick-up and storage and;
- Municipal Solid Waste Collection, Hauling and disposal the expected results of this PPP Improvement of the solid waste management in the touristic city of Aqaba. An average amount of 100 tons of solid waste is collected from the city and hauled to the landfill.

Currently ASEZA is working with the USAID through the ACOM project in rehabilitating and upgrading of the existing municipal landfill in order to enhance its capacity and operation.

- Oil Spills

More than 2300 ships use the port of Aqaba each year. In addition, tankers with a capacity of 100,000– 150,000 tons of crude oil arrive at Elat oil terminal every week, unloading about 3.5 million tons of oil per year. Accidental oil spills could have disastrous effects on coral reef ecosystems in the Gulf.

There are currently several efforts to create and implement effective strategies and action plans for combating small to medium-sized oil spills.

Fig.15. Prince Hamzah Oil Pollution Combat.

- Reef Damage

The increasing numbers of divers and tourists visiting 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

Eighteen dive centers in Aqaba operate 20,000 to 30,000 dives per year along the 1.2 km of coral reef area. In addition, fifty five 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.

- Municipal Wastewater Treatment.

The Aqaba city treatment plants produce about 4.5 million cubic meter of reclaimed water a year. This constitutes about 25% of the total yearly water supply. Reclaimed water produced by the natural treatment plant is used in irrigating bush and date palm trees only while the water produced by the mechanical plant is used for the green areas inside the city. The major part of it is used for industrial purposes.

11. Environmental Monitoring

- Marine Environmental Monitoring

The ASEZ Environmental Protection Regulation No. 21 for the year 2001 addresses the legal framework for environmental management and monitoring in the zone including environmental clearance and post-clearance phases of the economic activities in the Zone.

Monitoring surveys for ASEZA have been regularly conducted, including eleven locations distributed along the coast at three depths. This is being made through the national monitoring program for the marine environment established around 15 years ago, where the Marine Science station has been contracted to conduct the necessary monitoring for all relevant aspects and parameters including seawater and sediment quality, fisheries and coral reef. Moreover, ASEZA and as per the bylaws is requesting projects and developments with potential impacts on the marine environment to have their self-monitoring programs (findings submitted regularly to the Environmental Studies and Monitoring division at ASEZA.

Monitoring programs are critical aspect of documenting the state of environment at specific area, therefore monitoring of Aqaba's marine and coastal ecosystems is necessary to determine the their condition and status, to indicate whether management measures undertaken under the management schemes are proving effective, and to identify, where possible, any detrimental effects. There are several –in addition to the national program- monitoring program being carried out in Aqaba by different projects and facilities and there is a need that a common approach to monitoring should be established and provide all the information required to comply with the full range of national and international commitments and agreements/conventions. Therefore, "Mainstreaming Marine Biodiversity Conservation into Coastal Zone Management in the Aqaba" project is currently engaged in developing a marine monitoring guidance note that would provide a procedural guidelines and framework for monitoring of marine and coastal resources and enable judgments/ comparable assessments about the condition of features which are consistent between one person and another, and between one site and another.

This guidance note will be the technical document complementary to and supporting ASEZA and the other concerned institutions that are responsible for implementing monitoring programs so as to conduct them in a consistent manner and according to the standards.

- 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 Air Quality Monitoring network(AQMIN) was jointly funded and launched by the EU and ASEZA in March 2007 .This network includes a fixed air quality monitoring station mobile air quality monitoring station as well as air quality data management center. Figure (27) shows a public display panel showing some reading of the ambient air quality at the city of Aqaba tourism district in daily bases.

- Disaster Risk Management (DRM)

The 2005 Hyogo Framework for Action (HFA) is the main inter local framework guiding all work on disaster risk reduction (DRR) and the most widely accepted strategy around the world.

The HFA specifically identifies the integration of risk factors in urban development and the mainstreaming of disaster risk reduction in development programs and planning as two valid approaches. In recent decades, uncontrolled urbanization, migration influx, and environmental degradation have caused the increase of disaster risks in many rapidly developing cities around the world. In the city of Aqaba Case, the transformation of the city into a Special economic zone has led to an increased pressure on the natural resources as well as urban and capital infrastructures.

This has raised the level of awareness among policy makers at ASEZA to undertake some measures to make Aqaba a safe and resilient city. With the support and assistance of UNDP, ASEZA implemented two projects aimed at buidling capacities in disaster risk reduction and enhancing institutional capacities as well as to integrate climate change into relevant planning and development process. The outcomes of these two projects were an enhanced capacity of the government and CSOs to prevent, respond to, and mitigate natural disasters. Following the implementation of the project ASEZA decided to institutionalize the disaster risk reduction and management practice into its structure and established a Disaster Risk Reduction unit.

12. Marine Biodiversity Protection and Sustainability

ASEZA and in cooperation with United Nations Development Program (UNDP) and funded by the Global Environment Facility (GEF) is currently implementing the project "Mainstreaming Marine Biodiversity Conservation into Coastal Zone Management in the Aqaba" .The main goal of this project is to internalize biodiversity as an asset and value, and for economic and infrastructure development to take into account the sensitivity of the ecosystems while meeting national objectives and remaining

Fig. 16. Coral Translocation in Aqaba.

economically viable. The project main components are:

1. Knowledge management systems for planning and investment.
2. Promotion of biodiversity friendly investment and development.
3. Institutional capacity for Integrated Coastal Zone Management and biodiversity conservation.
4. Coral reef protection.

Progress so far included the successful completion of the translocation of coral communities from the new south port into selected sites within the marine park. The work has been initiated by the mid of 2012 and concluded by the mid of 2013. The "translocation" process included a number of activities included *inter alia*:

- Establishing nursery structures used to fix coral nubbins collected from the donor sites and deployed in front of the marine park's visitor center.
- Establishing a new artificial dive site using concrete tubes.
- Conducting number monitoring and evaluation missions for the translocated coral reefs. The early findings of these missions have confirmed good survival rates, which reflect the sound methodology and practices followed during the translocation process.

13. 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.
- Successful implementation of ICZM initiatives and activities depends on the existing of an appropriate institutional structure and the relevant capacities, therefore concerned authorities have to have dynamic capacity development plans in place for their staff.
- ICZM 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.
- Official adoption of ICZM programs by the concerned authorities is essential for ensuring appropriate, effective and quality outputs of such programs.
- Regular revision, monitoring and evaluation (and updating) of ICZM program are highly needed in order to cope with any emerging issues.
- In a multi-use coastal zone there will definitely become 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.
- Translocation and transplantation programs of coral reef communities from sites prone to damage is a good tool that, in case it is well designed and coordinated, would help in mitigating any potential adverse impacts that result from development activities in coastal areas, and could be consequently considered as a supplementary ICZM tool.

14. Recommendations for Improvements

- Because of the expected increasing pressures on the fragile marine habitats due to increasing tourism and industrial developments in Aqaba, ASEZA should formally prepare and implement an Integrated Coastal Zone Management and Planning Plan for the entire coastal areas.

In addition to adopt a process for updating that State of the Coast report (the first report to be published on October, 2014) as it helps to set the base for the ICZM Plan.

- ASEZA needs to put in place an effective plan to implement the sea use plan which will be also developed by the end of September, 2014. Such sea use plan is to be compatible with the currently adopted land use master plan.
- ASEZA should expedite the process to adopt and implement a detailed joint land and sea use master plan for the middle Beach Area " Alhafayer" that guarantees the integrity and use of this vital area as an open space green cover, and public beach facilities.
- ASEZA should conduct an assessment of the carrying capacity for the entire coastal zone to alleviate some existing environmental threats, and to maintain the balance between economically feasible development and adequate marine environment protection as well as to limit and prevent overloading the coastal zone with industrial and tourism activities.
- 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, in addition to a good signage system that would help maintaining public safety and manage beach activities and uses in an effective and sustainable manner.
- ASEZA should review and update its current Architectural Guidelines to reflect the current and future urban fabric in general and development in the coastal areas in particular, furthermore, to integrate some guidelines and standards for Urban and industrial development in the coastal areas into this document .
- ASEZA should adopt and apply beach management contracts in coordination with the private sector, ngo's and hotel owners to maintain access to the beaches at the north, middle and south tourism coastal areas.
- More attention is needed from ASEZA to overcome the obvious lack of synergy between the currently and future programs which deals with issues related to the marine environment and coastal areas.
- ASEZA should invest more to bring out public visibility of ICZM projects.
- ASEZA to establish a working group/committee chaired by AMP and includes representatives of all stake holders to design the ICZM monitoring and evaluation instruments based on the local dynamics and the special case of the governance system in Aqaba. This committee to be assigned for instant the regular update of this national report on ICZM. ASEZA may consider carry out the necessary capacity development and relevant orientation activities if needed.

Finally, it is important to point out that these 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 to further study and implement these recommendations.

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Appendix 1

ICZM International Indicators Examples:

1. **The UNESCOO Handbook** - A Handbook for Measuring the Progress and Outcomes of Integrated Costal and Ocean Management – 2006

This handbook was prepared based on the revision of all relevant international guidelines for the framework of ICZM. It incorporates the results, outcomes and lessons learned from eight pilot case studies in several countries.

In this handbook, the indicators reflect the three elements of ICZM as per the following:

- Governance indicators, which measure the performance of program components (e.g., status of ICZM planning and implementation), as well as the progress and quality of interventions and of the ICZM governance process itself;
- Ecological indicators, which reflect trends in the state of the environment. They are descriptive in nature if they describe the state of the environment in relation to a particular issue (e.g., eutrophication, loss of biodiversity or over-fishing). They become performance indicators if they compare actual conditions with targeted ecological conditions;
- Socioeconomic indicators, which reflect the state of the human component of coastal and marine ecosystems (e.g., economic activity) and are an essential element in the development of ICZM plans. They help measure the extent to which ICZM is successful in managing human pressures in a way that results not only in an improved natural environment, but also in improved quality of life in coastal areas, as well as in sustainable socioeconomic benefits.

These three categories include 15 Governance indicators, 9 ecological indicators and 13 socioeconomic indicators.

2. **The European Commission (EU) ICZM indicators:**
   a. National Reports on the Implementation of the ICZM in 2006. In these reports, two sets of indicators were adopted as per the following:
      i. Indicators to measure progress in implementing ICZM (the 'progress indicator').
      ii. A core set of 27 indicators of sustainable development of the coastal zone (the 'sustainability indicators').

   These two indicator sets are directly related. That is, the greater the penetration of ICZM into all levels of governance and activity in the coastal zone, the greater the likelihood that there will be a positive improvement in the state of the coast. And the more the coast is seen to improve, the greater will be a willingness to introduce further and more sophisticated aspects of ICZM. Thus the indicators should mutually reinforce one another to the long term benefit of the coastal zone.

   b. The EU National Reports on the Implementation of ICZM 2000 – 2010. The EU adopted specific format of the report. In these

reports the assessment of progress in ICZM and the state of the coast was based on indicators used in 2006 mentioned above, in addition to answering the following questions:

- What progress has been made in enhancing institutional coordination and integration (horizontal between sectors, vertical between levels of governance)?
- What progress has been made in enhancing participation?
- What progress has been made in establishing a knowledge-based approach to coastal planning and management (including the availability and use of information, availability and use of research, stimulation of education to support ICZM in long-term)?
- What progress has been achieved in making the use of coastal resources, including space, more rational and sustainable?
- What progress has been achieved in making coastal zones more resilient and prepared for risks, including climate change?
- How is the state of the coast evolving? Where has most progress been achieved in curbing unsustainable development trends? What are hotspots or issues that still require significant action?
- What progress has been achieved in addressing planning and management across the land-sea boundary?
- What progress has been achieved in addressing coastal issues in crossborder and/or regional sea context?
- How can the performance of the country be rated in implementing the ICZM principles (e.g. on a scale from 1 to 10, what progress has been achieved in implementing the principle(s)?; what is the further potential for progress?)?

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