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Application case: EB-ICZM for Aqaba, Jordan
Report type: Thematic Scoping
Issued by: Royal Marine Conservation Society of Jordan



Mediterranean Forum For Applied Ecosystem-Based Management



Item	Description	Key management issues	Key stakeholders
Biophysical systems	Identify each of the main components which constitute the key coastal and marine biophysical systems (e.g. climate; hydrological and hydrogeological system; coastal vegetation types; wetlands; mangroves; rocky coast;...	Identify the most important management issues (e.g. resource uses and/or conflicts; ecological problems/threats) and try to associate them with the related "biophysical component" by listing each of them in the...	Identify the most important stakeholders (e.g. institutional management, data provider, resources user) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.
Sea water			ASEZA Industrial Registered Enterprises Scientific and monitoring Centres: Ben Hayyan- Aqaba International Laboratories and Marine Science station and Royal Science Society Jordan Maritime Commission Private companies Royal Force Ranger (Environmental police)
Industrial sea water	Southern area is industrial, the waters in the area are classified as industrial.	Cooling waters intake Outflow cooling waters Desalination water (intake and outflow) Incidental impacts in water quality Ship balance waters Liquid and solid waste from ships	ASEZA Industrial Registered Enterprises Scientific and monitoring Centres: Ben Hayyan- Aqaba International Laboratories and Marine Science station and Royal Science Society Jordan Maritime Commission Private companies Royal Force Ranger (Environmental police)
Touristic sea water	Touristic open water and artificial touristic lagoons, included marinas	Water quality Solid waste Boat corridors	ASEZA Industrial Registered Enterprises Scientific and monitoring Centres: Ben Hayyan- Aqaba International Laboratories and Marine Science station and Royal Science Society Jordan Maritime Commission Private companies Royal Force Ranger (Environmental police)
Aqaba Marine Reserve	7 Km starting from the marine station to South.	Water quality Solid waste Incidental impacts in water quality	ASEZA Industrial Registered Enterprises Scientific and monitoring Centres: Ben Hayyan- Aqaba International Laboratories and Marine Science station and Royal Science Society Jordan Maritime Commission Private companies Royal Force Ranger (Environmental police)
Seaports and Terminals		Outflow cooling waters Incidental impacts in water quality Ship ballast waters Liquid and solid waste from ships	ASEZA Industrial Registered Enterprises Scientific and monitoring Centres: Ben Hayyan- Aqaba International Laboratories and Marine Science station and Royal Science Society Jordan Maritime Commission Private companies Royal Force Ranger (Environmental police)

Item	Description	Key management issues	Key stakeholders
☐ Coastal zone			Private sectors, included landowners ASEZA Royal Force Ranger (Environmental police) Jordan Maritime Commission
In the sea	Habitats: coral reefs; seagrasses; sandy habitat; rocky habitat	Natural (climate changes, flash floods, sever low tides) and anthropogenic (solid waste, included gears, sediments, fishery and divers' impacts) stressors	Private sectors, included landowners ASEZA Royal Force Ranger (Environmental police) Jordan Maritime Commission
Inland	Beaches, urban areas, sand dunes, fossil reef, agricultural areas, valley (seasonally flooded)	Building regulations and constructions (included sand extraction and destruction of agricultural areas) Coastal usage No regulated parking areas Possible use of chemicals in crops' products	Private sectors, included landowners ASEZA Royal Force Ranger (Environmental police) Jordan Maritime Commission
Plant species	<i>Identify key groups of species which, for any reason, are of particular interest for the management of the focused ecosystems (e.g. endemic; threatened; invasive; commercial. Note that plant communities/habitat may be...</i>	<i>Identify the most important management issues (e.g. resource uses and/or conflicts; ecological problems/threats) and try to associate them with the related "biophysical component" by listing each of them in the...</i>	<i>Identify the most important stakeholders (e.g. institutional management, data provider, resources user) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.</i>
☐ Marine Flora			

Item	Description	Key management issues	Key stakeholders
Seagrasses	<p>Seagrasses are hydrophytes, which can grow, flower, go to seed, and germinate while fully submerged. They inhabit soft bottomed, shallow water areas of temperate, subtropical and tropical seas where they may form large. Seagrasses play several key ecological roles in the marine environment; they are considered primary producers, food for herbivores, important in depositing and stabilizing coastal sediments and they provide habitats for many marine species. Eleven species of seagrass have been reported in the Red Sea. Out of the six species reported in the Gulf of Aqaba, only <i>Halophila stipulacea</i>, <i>Halophila ovalis</i> and <i>Halodule uninervis</i> were found at the Jordanian coast.</p> <p>The distribution and abundance of seagrass communities have been investigated from 3 sites along the Jordanian coast of the Gulf of Aqaba. The investigation showed that the seagrass <i>Halophila stipulacea</i> has the widest distribution in all sites. The other two species <i>Halodule uninervis</i>, and <i>Halophila ovalis</i> were less abundant. and were found only at shallow depths at the Tala Bay site. The seagrass distributions increased with increasing depth up to 12 m, and thereafter decline. However, in some shallow areas seagrass is completely absent (e.g. 2 m depth at Hotel Area) mainly due to the extensive human activities including swimming and boating in the area. Such activities can increase sedimentation and turbidity which is lethal to seagrass beds.</p> <p>Seagrasses have great economic value for fisheries that depend on the presence of coastal seagrass meadows. Human populations in some coastal countries have put various parts of these plants to good use over the centuries. Blades are by far the part most often...</p>	<p>Some of the species are used for medicine purposes. Climate changes Anthropogenic impacts Hazard of introduction of invasive species (linked to the ballast waters)</p>	<p>ASEZA Marine Science Station JREDS Environmental and local NGOs (Fishermen; Divers)</p>

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CORAL-TURF ALGAE	<p>In many areas the loss of coral cover and diversity is coupled with an increase in algal biomass and shift in algal community structure). The coral reefs of the Gulf of Aqaba, as with many other reefs in the world, are currently experiencing such coral-algae phase shift from reefs dominated by coral, toward turf algae- dominated reefs (Bahartan et al. 2010). The Gulf of Aqaba coral reefs are greatly jeopardized by such expansion of this phase shift, as the ailing reef becomes overgrown by bushy algal turfs that trap sediment and do not serve as healthy habitat for marine life, or many of the various other advantages provided by live coral reefs. Despite the ecological and conservation significance of the phase-shift phenomenon and the socio-economic implications for the thriving tourism industry and local fisheries in the Gulf of Aqaba, little is known about the factors responsible for the appearance and proliferation of the TA on the Gulf of Aqaba reefs.</p> <p>on the occurrence and spatial distribution of turf algae (TA) on coral reefs, coralline algae, and stony (reef-building) corals at seven sites along the Jordan coast of Gulf of Aqaba each of which is impacted by industrial and/or recreational activities. The results of the survey of Turf Algae coverage in different sites and depths showed that Turf Algae coverage varied between sites; the shallower transects consistently contained higher percentages of turf algae than the deeper transects; the size of the algae was subjectively bigger at 8 m than at 15 m; and the average turf algae percentage cover was consistently higher at 8 m than at 15 m. The results of the survey showed also that more dense turf algae were observed in...</p>	<p>Some of the species are used for medicine purposes. Climate changes Anthropogenic impacts Hazard of introduction of invasive species (linked to the ballast waters)</p>	<p>ASEZA Marine Science Station JREDS Environmental and local NGOs (Fishermen; Divers)</p>

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Macro Algae	<p>Seaweeds are known as marine macroalgae, are multicellular algae that inhabit the oceans. Seaweeds are important in the economy of coastal seas, they create habitat for many marine organisms, contribute substantially to primary production and are consumed by a wide variety of animals, particularly sea urchins, snails and fish.</p> <p>Humans use seaweeds manufacture a variety of dietary, medicinal, and industrial applications in many of the affluent countries. Some red and green algae deposit calcium carbonate in their cell walls and are important contributors to the formation of coral reefs. Algae are a food source for many organisms, including humans, and they provide a habitat for many species. The three groups of seaweeds red algae (phylum Rhodophyta), brown algae (phylum Phaeophyta), and green algae (phylum Chlorophyta) are reported along the Jordanian coast. In Jordan, however, no algae are collected for consumption or for industrial purpose such as the production of food or medicinal drugs.</p> <p>Sometimes, the fishermen mix algae with fish pieces and flour to make a paste which is used as bait in fish traps.</p> <p>Al-Zibdah and Damhoureyeh (2006) reported on the presence, in the Jordan Gulf of Aqaba, of 33 species belonging to 3 families,...</p>	<p>Some of the species are used for medicine purposes.</p> <p>Climate changes</p> <p>Anthropogenic impacts</p> <p>Hazard of introduction of invasive species (linked to the ballast waters)</p>	<p>SEE Marine Environment Report and UNDP Document</p> <p>ASEZA Marine Science Station JREDS Environmental and local NGOs (Fishermen; Divers)</p>
Terrestrial Flora	<p>Anabasis articulata Hammada scoparia Cassia italica Zygophyllum dumosum Caralluma spp. Fagonia spp. Reaumuria hirtella Gymnocarpos decandrus Helianthemum lippii Asteriscus graveolens Sclerocephalus arabicus Anastatica hierochuntica Capparis spinosa</p>		<p>Ministry of agriculture ASEZA Landowners Beach users (as users)</p>

Item	Description	Key management issues	Key stakeholders
Animal species	<p>=> Identify key groups of species which, for any reason, are of particular interest for the management of the focused ecosystems (e.g. endemic; threatened; invasive; commercial).</p> <p>=> Identify also key groups/taxa which are important in the structure of the relevant ecosystems and related services (e.g....</p>	<p>Identify the most important management issues (e.g. resource uses and/or conflicts; ecological problems/threats) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.</p>	<p>Identify the most important stakeholders (e.g. institutional management, data provider, resources user) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.</p>
Birds	<p>Other important bird's species which can be observed within the proposed AMR is the Red Sea endemic White-eyed Gull <i>Ichthyaetus leucophthalmus</i> which is a resident in the region. Another species includes the Western Reef Heron <i>Egretta gularis</i> which was known to breed previously in the area though would benefit from a specific rehabilitation (breeding) Program. In addition, some tern species can be observed such as the Common Tern <i>Sterna hirundo</i> and Little Tern <i>Sternula albifrons</i>....</p>	<p>Destroy the natural habitat Aqaba bird observatory Ayla Oasis – Agreement to monitor the bird</p>	
Terrestrial Mammals	<p>A single common species to Jordan has been recorded in the proposed AMR which is the red fox; <i>Vulpes vulpes</i>. In addition, the feral dogs <i>Canis familiaris</i> can be encountered frequently in the area. However, the areas adjacent to the AMR area hold the presence of eight mammalian species that belongs to three families</p> <p><i>Tadarida teniotis</i> <i>Pipistrellus kuhli</i> <i>Vulpes vulpes</i> <i>Canis familiaris</i></p>	<p>Destroy the natural ecosystem</p>	

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Zooplankton	<p>Despite the importance of zooplankton in marine food chains, most of the relatively few systematic seasonal studies in the Gulf of Aqaba focused on isolated taxonomic groups (Al-Najjar 2002). The zooplankton community > 150µm in the Gulf of Aqaba comprises 73 species included in 45 genera within 10 taxa namely; Tintinnidea, Foraminifera, Trachymedusea, Thecosomata, Cladocera, Ostracoda, Copepoda, Malacostraca, Chaetognatha and Urochordata. The zooplankton is represented mainly by holoplanktonic forms, which constitute about 91.5% of the total zooplankton abundance. These are mainly Copepoda and Chaetognatha, which together comprise more than 90% of the total zooplankton. Copepods alone contribute numerically 87% of the total zooplankton abundance with annual average of 693 organism/m³. The adult forms constituted 65% of the copepoda. Hence production of this group is often considered to be equivalent to the secondary production. The adult forms constituted 65% of the copepods, while the copepodite stages and nauplii constitute 29 and 6% respectively.</p> <p>In total 56 copepod species belonging to 30 genera within 24 families in four orders; Calanoida (35 species); Cyclopoida (3 species); Ociostomatoida (14 species) and Harpacticoida (4 species) which constitute 61, 17, 21, and 1% of the total copepod abundance, respectively. Most species (36 species) are classified as oceanic, while 10 species as neritic – oceanic, 8 species as neritic and 2 species as coastal neritic. 6 species were observed as a new geographical record for the Gulf of Aqaba. The annual average of the total zooplankton abundance in the Gulf of Aqaba is 803 organisms/m³. High...</p>	<p>National Monitoring Program</p> <p>ASEZA has been implementing a national monitoring program since the year 2002 to monitor the quality of seawater, coral reefs, benthic communities and fish. This ongoing program is implemented along the Jordanian Coastline through contracting with the Marine Science Station which belongs to the University of Jordan and Yarmouk University</p> <p>Aim and objectives of the National Monitoring Program: The aim of the monitoring program is to provide resource managers with necessary baseline data on seawater, bottom surface sediment, and coastal habitat quality to help them better understand the coastal ecosystem functioning and enable them to adopt suitable management schemes. The main specific objectives of the monitoring program are to:</p> <ol style="list-style-type: none"> 1) Generate systematic records of the seawater physical properties: transparency, conductivity, temperature, salinity, and currents. 2) Generate systematic records of the seawater chemical and biological properties, dissolved oxygen, conductivity, pH, ammonia, nitrate, nitrite, phosphate, silicate, and chlorophyll a. 3) Generate baseline records of the bottom sediment quality parameters sedimentation rate, color and odor, redox potential, grain size, concentrations of calcium carbonate, organic carbon, organic nitrogen, and total phosphorus. 4) Generate baseline records of the bottom habitat on live coral cover and reef health. 5) Generate baseline records of fish abundance... 	
	<p>Twelve species of Urochordata, two Chaetognatha and 510 species of fishes were reported from the Gulf of Aqaba (Jordan Country Study on Biological Diversity, 1998).</p> <p>The total numbers of species along the Jordanian coasts are eighteen in Chondrichthyes and 492 in Ostichthyes or 510 in total belonging to 109 families, an average 4.7 species per family. The distribution of</p>		

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Fish	<p>species among families was found that 79 fish families are represented by only 1-3 species, 14 families are represented by more than 10 species. In terms of species richness per family the ichthyofauna showed the following ranking (given as n number of species in the family, n% of the total fish fauna): Wrasse labridae (51, 10.1), Pomacentridae (29, 5.7), Serranidae (25, 4.9), Apogonidae and Blenniidae (24, 4.7 each), Gobbiidae (21, 4.1 each), Carangidae (17, 3.4) and Syngnathidae (16, 3.2). These 8 families account for 40.8% of all species. Seventy six fish species are indicated with (*) in the inventory represents a new report to the Jordanian coast, including <i>Gymnothorax monochrous</i>, <i>Myripristis xanthacra</i>, <i>Corythoichthys haematopterus</i>, <i>Syngnathus macrophthalmus</i>, <i>Istiblennius flaviumbrinus</i>, <i>Enneapterygius destai</i> and <i>Grammatorycnus bilineatus</i> are the first confirmed report from the Gulf of Aqaba. The family Scombridae includes the most important commercial species in Aqaba. It represents more than 70% of the Jordanian marine catch, specially the most abundant migratory species Skipjack Tuna (<i>Katsuwonus pelamis</i>) and Kawakawa (<i>Euthynnus affinis</i>). Other important commercial fish species are Mackerel Scad (<i>Decapterus macarellus</i>), Shortfin Scad (<i>Decapterus macrosoma</i>), Fusillers (<i>Caesio lunaris</i>, <i>Caesio suevica</i> and <i>Caesio varilineata</i>). Ecological analysis of the Jordanian marine fishes indicates grass meadows, and 0.6% is bathydemersal species. Whereas, among, pelagic habitat 9.6% of the fish species are living in open waters, 3.0% are associated with reef, 2.6% are benthopelagic, 1.7% lives in shallow water, and only 0.4% are bathypelagic species. The most abundant shallow water pelagic species are the silver side fish <i>Atherinomorus lacunosus</i>, and the clupeid fish, <i>Spratelloides gracilis</i>. The most common inhabitant of deep sea fishes are Iago omanensis, <i>Rhinobatos punctifer</i>, <i>Mureanesox cinereus</i>, <i>Carangoides equula</i>, <i>Paracaesio sordida</i>, <i>Polysteganus</i></p>		Reefcheck

Item	Description	Key management issues	Key stakeholders
	<p>coeruleopunctatus, Argyrops spinifer, Upeneus davidaromi, Trichiurus lepturus, Thyrstitoides marleyi. An analysis of the feeding behavior of the Jordanian marine fishes indicates that 30.6% of the species feed on fish and invertebrates, while 24.8% feed on invertebrates, the planktivorous fish constitute only 15.9%, 15.0% are omnivores, 7.4% are herbivorous, 4.5% piscivore, 1.6% corallivore and only 0.5% detritivore feeders. In comparison with the number of fish species collected from the Red Sea 1,248 species (Goren & Dor, 1994) which extends for 1,932 km, this study indicates that the Jordanian coast with only 27 km at the Gulf of Aqaba, hosts 507 fish species which accounts for about 40.6% of the Red Sea fishes. In comparison (Golani et al. 2002) reported that the Mediterranean Sea hosts 650 fish species, and (Carpenter et al. 1997) published the most comprehensive account of fishes of the Arabian Gulf, reporting 535 species from the Gulf. This clearly indicates that the Jordanian coast is characterized by a high fish diversity, which is attributed to the diversity of habitats existing along the coast such as: Coral reef, seagrass meadows, sandy habitats and deep sea fish fauna. (Roberts and Ormond 1987) indicated that the species richness is also positively correlated with habitat diversity. Two families, Lutjanidae, and Haemulidae were not common in the Jordanian coast in comparison with their abundance, frequency of appearance and number of species as in the central and southern Red Sea. It is very rare to see a member of these families while diving in Aqaba. Reef structure in the Jordanian coast of Aqaba Gulf is smaller in size...</p>		
Carnivores	See Main Component Fish for Description		Reefcheck
Pelagic fish	See Main Component Fish for Description		Reefcheck
Coastal fish	See Main Component Fish for Description		Reefcheck
Reef fish	See Main Component Fish for Description		Reefcheck

Item	Description	Key management issues	Key stakeholders
Crustacea	<p>Attached List _ Full information_Coastal Zone_JREDS</p> <p>1202 Species were recorded.</p> <p>The mobile crustaceans occurring in the rocky intertidal include the isopode <i>Ligia exotica</i> and the amphibious grapsoid crabs <i>Grapsus granulatus</i>, <i>G. albolineatus</i>, <i>G. tenuicrustatus</i> and <i>Plagusia tuberculata</i>. <i>G. granulatus</i> is the most abundant, inhabiting in the upper and mid midlittoral on slab where refuges are available. The other grapsoids are characteristic of the mid midlittoral boulder habitats, with <i>G. albolineatus</i> being the most common.</p> <p>The sympatric species of gastropods living in the rocky intertidal zone include the supralittoral fringe <i>Nodilittorina subnodosa</i> and <i>N. millegrana</i>, the midlittoral <i>Nerita sanguinolenta</i>, <i>N. polita orbignyana</i> and <i>N. quadricolor</i>; and <i>Clypeamoms moniliferum</i> and <i>C. tuberculatum</i>. Among the rocky intertidal crustaceans, sympatric species include those of the crab <i>Grapsus</i>, <i>G. albolineatus</i>, <i>G. granulatus</i> and <i>G. tenuicrustatus</i>. There are varying degrees of spatial and reproductive isolation within the sympatric species that prevent interbreeding. The occurrence of so many sympatric species in the rocky and sand beach (<i>Hippa celaeno</i> and <i>H. picta</i>) intertidal zone of Jordan is unusual when compared with other geographic areas....</p>		

Item	Description	Key management issues	Key stakeholders
Mollusca	<p>On the Jordanian coast of the Gulf of Aqaba, a total of 645 species of mollusc were recorded (Jordan Country Study on Biological Diversity, 1998) The number of mollusc species and genera reported from the Jordanian coasts of the Gulf of Aqaba are presented in Table 5.3. The phylum mollusca is represented by 5 classes in the Jordanian coastlines of the Gulf of Aqaba. These classes are as follows: Gastropoda is represented by 462 species, which equals about 71 % of the phylum (some of the names are synonyms); Bivalvia or Lamellibranchia is represented by 162 species, which equals about 25% of the phylum (some of the names are synonyms); Polyplachophora is represented by 17 species, which equals about 2.6% of the phylum (some of the names are synonyms); Cephalopoda is represented by 2 species only, which equals about 0.3% of the phylum; and Scaphopoda is represented by 2 species only, which equals about...</p>		
Reptiles			

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Marine Reptiles	<p>Three globally endangered species of the Marine Turtle were found at Aqaba including the Green Sea Turtle; Chelonia mydas, Loggerhead Sea Turtle; Caretta caretta, and the Hawksbill Sea Turtle; Eretmochelys imbricate</p>	<p>Threats and conservation initiatives matrix for marine turtles in the Jordan Gulf of Aqaba (extracted from PERSGA/GEF 2004 and PERSGA 2006). Major Threats Major Threats Scale</p> <p>Dredging /Land-filling 2 Commercial Fisheries 3 Artisanal Fisheries 1 Habitat Destruction 2 Oil Industry 2 Conservation Initiatives Conservation Initiatives Scale Legislation & Coordination 2 Research & Monitoring 3 Enforcement & Implementation 1 Education & Awareness 2 Community Participation 2</p> <p>Notes: Major Threats Scale: (1)-None; (2)-Small; (3)-Moderate; (4)-High; (5)-Critical Conservation Initiatives Scale: (3)-Negligible; (2)-Moderate; (1)-Established & Operational\ Artisanal (Traditional) Fishing includes egg collection.</p> <p>No nesting turtles were sighted in this area due to the absence of nesting beaches. This can be attributed to the effect of the rapid urbanization and ports development that the Jordanian coast has witnessed in the past three decades, which certainly limited the space allowed for nesting...</p>	
Terrestrial reptiles	<p>Very low diversity of reptiles exist in Jordan, with eight recorded species from which three have been observed in the proposed AMR area. Table 15 illustrates the reptilian species that survive within the proposed AMR area and its adjacent localities. Two species: Cyrtopodion scabrum and Hemidactylus turcicus</p>		
Mammals			

Item	Description	Key management issues	Key stakeholders
Marine mammals	Dolphins (seasonally visiting Aqaba)	CITES, CBD Solid Waste, illegal fishing	
Terrestrial mammals			
		<p>The following provide a summarized description to the major threats on marine ecosystems in Aqaba based on the available literature and knowledge.</p> <p>Natural Threats, include: Natural Predators, Diseases, and Extreme Low Tide</p> <p>Anthropogenic Threats, include: Fishing Gear: Despite the small scale of fishing at Aqaba, but it affects corals and other organism seriously since reefs are very limited in area, and are of fringing type, which entitles they are located at shallow depths. Fishermen tend to use gear consist of nets, ropes, cages and nylon lines, where almost all are made of non-biodegradable materials. In addition, loosing gear or abandoned it will contribute to the marine debris and. It will cause a phenomenon known as 'ghost fishing, which extremely affecting all marine life health and abundance worldwide.</p> <ul style="list-style-type: none"> • Tourism Impact: Diving industry is growing in Aqaba with the presence of 27 diving centers and 27 diving sites. Despite the importance of this industry to tourism business, but it could contribute to serious damage to coral reefs and fish community if no proper control and management approach was applied. • In addition, tourism could affect coral reefs and fish community in-directly through the expansion of tourism infrastructure and facilities, where high siltation and sedimentation rates through poorly planned and constructed hotels and resorts facilities are the primary cause of damage. • Ports Establishment: Ports establishments contributes to the loss of hard corals and coral habitats and substrate through various means including the break of limestone and coral materials into extremely fine particles after dredging activities or the created sedimentation after landfilling activities over the construction phase. Based on the survey results, ASEZA has initiated coral transplantation efforts in 2012 where coral reefs 	

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		<p>from the southern region of the coast and the Al Derreh area were placed at damaged reefs and a created cave site from cement and metal structures at Aqaba Marine Park</p> <ul style="list-style-type: none"> • Corals and fish Harvesting and Trade: Coral and fish are collected in the dried ornamental trade business for souvenirs and jewellery at Aqaba and even Amman city. Smuggling of dead corals specimens occurred in Jordan, where they are used as souvenirs. A detailed study on the magnitude and impact of coral and fish trade is required to understand its effects on marine ecosystem diversity and presence. During 2003, Jordan Management Authority has requested the Secretariat to inform all Parties that it applies stricter domestic measures with regard to trade in corals, in accordance with Article XIV, paragraphs 1 (a) and (b), of the Convention. Moreover, it stated that the collection of corals and the breaking of coral reefs are strictly prohibited in Jordan and offences are liable to fines and/or imprisonment. No import into or export from Jordan of corals is allowed except for scientific purposes and under permits granted by the Management Authority. And lastly, it make a notification to the Parties that Jordan requests all Parties not to authorize any export of coral specimens to Jordan and not to authorize any import of such specimens from Jordan, except where the Management Authority has issued a permit to authorize the trade for scientific purposes. • A single aquarium is located at the Marine Science Station at Aqaba southern beach. Despite its importance for tourism attraction, but substantial harvesting of live corals and fish specimens occurs directly from the sea for exhibition purposes. Therefore, it is highly recommended to establish husbandry facilities for fisheries, and create artificial structures resembling corals in the aquariums to conserve the natural species diversity at the Gulf of Aqaba • Marine Debris: The most significant accumulated debris at Aqaba's sea is the plastic • Ship Grounding and Anchoring: The grounding of large commercial ship and even the small recreational boat can cause massive damage to coral reef organisms. The effects will escalate and more injury to the reef will occur during the process 	

Item	Description	Key management issues	Key stakeholders
		<p>of removing the grounded vessel from the hard-bottom habitat</p> <ul style="list-style-type: none"> • Oil Spill: Oil floating on the water's surface can be deposited directly on corals in an intertidal zone when the water level drops at low tide. Rough seas can mix lighter oil products into the water column, where they can drift down to coral reefs. As heavy oil weathers or is mixed with sand or sediment, it can become dense enough to sink below the ocean surface and smother corals below. Despite the strict regulation at Aqaba, and the Zero Discharge policy, but few incidents of oil spill has been recorded • Climate Change: Raise in seawater temperature and ocean acidification linked to rising carbon dioxide levels re by far the greatest threats to reefs and marine life worldwide. High water temperatures cause corals and other related ecosystems to lose the microscopic algae that produce the food corals need and create coral bleaching. Severe or prolonged bleaching can kill coral colonies or leave them vulnerable to other threats <p>1.4 Conservation Efforts at Aqaba</p> <p>1.4.1 The Aqaba Marine Park</p> <p>The Aqaba Marine Park (AMP) was established in 1997 over an area of 7 km to conserve and manage the natural near-shore marine environment of the Aqaba south coast region with its rich biodiversity, while allowing touristic uses at sustainable levels, for the benefit and enjoyment of the present and future generations of Jordanians and the global community (Abu Awali et al., 2017). The AMP is located south of Aqaba city stretching from the Passenger Terminal in the North to the Police Officers' Club in the South. The area's terrestrial boundaries lie 50 m east of the Mean High Water Mark and the marine boundaries lies 350m west of the mean high water mark.</p> <p>1.4.2 Legal Framework to Protect Corals at Aqaba</p> <p>1.4.2.1 Legislations at the National Level</p>	

Item	Description	Key management issues	Key stakeholders
		<p>Jordan's government has issued three main legal frameworks, where coral protection has been addressed either directly or indirectly and these are:</p> <ol style="list-style-type: none"> 1. Aqaba Special Economic Zone Law No. 32 for the year 2000 and its amendments: this law is implemented by the Aqaba Special Economic Zone Authority (ASEZA), and contains two major bylaws, and an additional two regulations that are linked to corals and reef corals protection (Abu Awali et al., 2017), as follows: <ul style="list-style-type: none"> • Aqaba Marine Park Bylaw No. 22 for the year 2001 • Environmental Protection Bylaw No. 21 for the year 2001 • Scientific Research at the Aqaba Marine Park Regulations No 82 for the year 2005s <p>In addition, two main instructions developed by ASEZA in cooperation with the Jordan Maritime Authority (JMA) in relation to ship grounding among other causes of possible marine environmental damage and resulted in the establishment of committee. The instructions provided a compensation of four thousand (4,000.00 JOD) for every 1 m2 damage of coral reef as a result of breaking, covering, killing or even transporting. The instructions are:</p> <ul style="list-style-type: none"> • Instructions No 37 for the year 2002 on "Evaluation Committee E- as adopted." • Instructions No 55 for the year 2004 "Regulations of Environmental Damage 55" <ol style="list-style-type: none"> 2. The Environment Protection Law No. 6 for the year 2017: governed by the Ministry of Environment and contains articles related to corals protection and defines penalties of violation. 3. The Agricultural law No. 13 for the year 2015: This law is governed by the Ministry of Agriculture, and contains two regulations that are linked to coral protection, which are: <ul style="list-style-type: none"> • Trade in Endangered Plants and Animals Regulations No. Z\ 2 for the year 2010 • Fishing at Aqaba Regulations No. Z\5 for the year 2006 <p>In addition, ASEZA is implementing a "Zero Discharge" policy, aiming to preserve the marine environment through the complete elimination of</p>	

Item	Description	Key management issues	Key stakeholders
<p>☐ Corals</p>	<p>About 200 species of soft and hard corals</p>	<p>marine pollution (Abu Awali et al., 2017). The Gulf of Aqaba is defined as a 'special area' according to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) signifying that discharges of oil are prohibited from vessels.</p> <p>1.4.2.2 Legislations at the International Level</p> <p>The government of Jordan has signed and ratified several conventions and engaged in different initiatives which are linked to coral reefs protection. All ratified conventions are legally binding, which states that the government of Jordan shall fulfill its own national legislative requirements. The following describe the conventions, which were signed or ratified by the Government of Jordan.</p> <p>1.4.2.2.1 Convention on Biological Diversity (CBD)</p> <p>Jordan has ratified the CBD, and become a party in 1994, where the Directorate of Nature Conservation at the Ministry of Environment acts as the focal point to this convention. This convention has urged parties to conserve coral reefs where the extensive coral bleaching was highlighted in the fourth Conference of the Parties (COP) meeting, which was conducted in 1998. Based on that, decision IV/5, requested the Subsidiary Body on Scientific, Technical and Technological Advice to analyze the coral bleaching phenomenon in relation to global warming and provide relevant information to the fifth meeting of the COP. A year after, COP has decided in its decision V/3 to integrate coral reefs, and bleaching into marine and coastal living resources program, and urged the necessity to develop and implement a specific work plan on coral bleaching, in cooperation with the United Nations Framework Convention on Climate Change and with relevant conventions and organizations. This was followed by decision VII/5, has adopted 1) appendix 1 related to a Specific Work Plan on Coral Bleaching and appendix II on the Elements of a Work Plan on Physical Degradation and Destruction of Coral Reefs, including Cold Water Corals. The following activities were developed for the Specific Work Plan on Coral Bleaching: i) management actions and strategies to support reef resilience,</p>	<p>Reefcheck</p>

Item	Description	Key management issues	Key stakeholders
		<p>rehabilitation and recovery, ii) information gathering, iii) capacity-building, iv) policy development\ implementation, and v) financing (https://www.cbd.int/soi/).</p> <p>1.4.2.2 Convention on International Trade in Endangered Species of Plants and Animals (CITES)</p> <p>The Government of Jordan has ratified CITES convention and came into force in Jordan in 1979. The management authority is shared between three national entities, which are: i) the Ministry of Agriculture, ii) the Royal Society for the Conservation of Nature and iii) Al Mawa for Wildlife and Nature. The Resolution Conference 11.10 (Rev. CoP15) regulates the trade in stony corals where it urges parties and other bodies from range and consumer States to: i) collaborate and provide support, coordinated by the Secretariat, to produce as a priority accessible and practical guides to recognizing corals and coral rock in trade and to make these widely available to Parties through appropriate media, and ii) seek synergy with other multilateral environmental agreements and initiatives to work for the conservation and sustainable use of coral reef ecosystems (http://www.cites.org/eng).</p> <p>1.4.2.2.3 United Nations Framework Convention on Climate Change (UNFCCC)</p> <p>Jordan has ratified the UNFCCC in 2016 as a non-Annex I party. The framework of this convention aims to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The convention highlights the importance of coral reefs as carbon storage, as well as its contribution to climatic conditions. Therefore, it urges parties to establish measures in order to protect this ecosystem through various mitigation and adaptation measures.</p> <p>1.4.2.2.4 World Heritage Convention (WHC) - United Nations Educational, Scientific and Cultural</p>	

Item	Description	Key management issues	Key stakeholders
		<p>Organization (UNESCO)</p> <p>The Government of Jordan ratified the UNESCO World Heritage Convention in 1975. The convention aims to protect natural and cultural places of Outstanding Universal Value. It recognizes the importance of corals in world heritage conservation, thus it has established several measures to build its resilience, by reducing local human pressure. The first global scientific assessment of climate change impacts on World Heritage coral reefs, published by UNESCO's World Heritage Centre in 2016, revealed that 25 of 29 listed reefs experienced bleaching stress in the last three years. The analysis predicts that all 29 coral-containing World Heritage sites might cease to exist as functioning coral reef ecosystems by the end of this century if CO2 emissions are not drastically reduced.</p> <p>WHC contains World Heritage Marine Programme that aims to establish effective conservation of existing and potential marine areas of Outstanding Universal Value. It works with four focus areas, which are: i) safeguarding, ii) network, iii) training and iv) exploring (More information are available online at http://whc.unesco.org/en/marine-programme).</p> <p>1.4.2.2.5 Jeddah Convention</p> <p>It was established in 1982, after a Regional Intergovernmental Conference held in Jeddah city at the Kingdom of Saudi Arabia. It was formally titled as the "Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment". The Jeddah Convention expresses in clear terms the commitment and the political will of the governments of the region to tackle the marine and coastal environments of the Red Sea and Gulf of Aden through joint coordinated activities (http://www.persga.org/inner.php?mainid=32).</p> <p>1.4.2.2.6 International Convention for the Prevention of Pollution from Ships (MARPOL)</p> <p>This convention entered into force in 1983, where Jordan is part. MARPOL is short for marine pollution, and it is considered as one of the most</p>	

Item	Description	Key management issues	Key stakeholders
		<p>important international marine environmental conventions. It was developed by the International Maritime Organization in an effort to minimize pollution of the oceans and seas, including dumping, oil and air pollution. The objective of this convention is to preserve the marine environment in an attempt to completely eliminate pollution by oil and other harmful substances and to minimize accidental spillage of such substances (http://www.imo.org/en/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol).aspx).</p> <p>1.4.2.2.7 The London Convention</p> <p>The "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972," the "London Convention " for short, entered into force on 24 March 2006. It is one of the first global conventions to protect the marine environment from human activities. The Convention has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. In 1996, the "London Protocol" was agreed to further modernize the Convention and, eventually, replace it. Under the protocol, all dumping is prohibited, except for possibly acceptable wastes on the so-called "reverse list" (More information are available online at: http://www.imo.org/en/OurWork/Environment/LCLP/Pages/default.aspx).</p> <p>1.4.2.2.7 Basel Convention (1992)</p> <p>Also called the Convention for the Control of Transboundary Movement of Hazardous Wastes and their Disposal, Jordan declared its territory as forbidden to the importation or transshipment of foreign hazardous wastes (http://www.basel.int/).</p> <p>1.4.3 National Monitoring Program</p> <p>ASEZA has been implementing a national monitoring program since the year 2002 to monitor the quality of seawater, coral reefs, benthic</p>	

Item	Description	Key management issues	Key stakeholders
		<p>communities and fish. This ongoing program is implemented along the Jordanian Coastline through contracting with the Marine Science Station which belongs to the University of Jordan and Yarmouk University (Abu Awali et al., 2017).</p> <p>1.4.4 Reef Check</p> <p>The Royal Marine Conservation Society of Jordan (JREDS) hosted a Reef Check EcoDiver Training in Aqaba with the aim to raise awareness and knowledge about coral reefs and to build up a team of qualified divers for further reef monitoring activities at the Jordanian Red Sea coast. JREDS...</p>	
Soft Corals			Reefcheck

Item	Description	Key management issues	Key stakeholders
<input type="checkbox"/> Hard Corals	<p>Attached List _ Full information_Coastal Zone_JREDS</p> <p>Based on "The hard Corals of Jordan, A Field Guide, 2019", a total of 157 hard coral species were positively identified based on the analysis of the photographic data set, the collected specimens and the existing taxonomic literature: 153 scleractinian corals (Anthozoa, Scleractinia), 1 organ pipe coral (Anthozoa, Alcyonacea), and 3 fire corals (Hydrozoa, Milleporidae). Scleractinian coral species found in this study belong to 15 families and 59 genera. Of the scleractinian corals, 147 are zooxanthellate (hosting the photosynthetic dinoflagellate Symbiodinium) and six azooxanthellate. 15 scleractinian corals found and photographed during the field survey are currently known to occur exclusively in the Red Sea and are hence considered RS endemics (Al-Tawaha, et al. 2019).</p> <p>In particular, 65% of the 23 known Red Sea endemic coral species were found in Jordan. Based on the collected data, 9.8% of the scleractinian corals recorded between 0 and 30m in Jordan in the present study are RS endemics (Al-Tawaha, et al. 2019). It is noteworthy that 5 of the Red Sea endemics, namely <i>Pachyseris inattesa</i> Benzoni & Terraneo 2014, <i>Cyphastrea kausti</i> Bouwmeester & Benzoni 2015, <i>Cyphastrea magna</i> Benzoni & Arrigoni 2017, <i>Echinophyllia bulbosa</i> Arrigoni, Benzoni & Berumen 2016, <i>Sclerophyllia margariticola</i> Klunzinger 1879 have been only recently described or resurrected thanks to the integrated systematics approach including morphological and genetic data coming from a reference collection performed from Saudi Arabia.</p>		Reefcheck
<input type="checkbox"/> Other Invertebrates			

Item	Description	Key management issues	Key stakeholders
Cnidaria	<p>The phylum includes three classes:</p> <p>Hydrozoa: Hydrozoans display either the polypoid or the medusoid structure, and some species pass through both forms in their life cycle. Twenty-four hydrozoan species belonging to 21 genera were recorded from the Jordanian side of the Gulf of Aqaba. The most famous hydroid species is the fire coral or stinging coral (<i>Millepora exesa</i>).</p> <p>Scyphozoa: Most frequently referred to as Jellyfish. In this class the medusa is the dominant and conspicuous individual in the life cycle; the polypoid form is restricted to a small larval stage. Only three species belonging to three genera were recorded tropical reefs, the scleractinian corals. Scleractinian corals live in symbiotic association with brown-colored dinoflagellates known as "zooxanthellae".</p> <p>Cnidarians, on the Jordanian side of the Gulf of Aqaba, received much attention since the early seventies. A total of 158 species of scleractinian corals belonging to 51 genera were recorded from the Jordanian side of the Gulf of Aqaba. The number of some Cnidaria species and genera reported from the Jordanian coasts of the Gulf of Aqaba are presented in Table 5.3. However, these species represent limited areas of the Gulf of Aqaba, and the taxonomic validity of some species must be revised.</p> <p>from the Jordanian side of the Gulf of Aqaba....</p>		
Echinodermata	<p>Sea stars, sea urchins, sea cucumbers</p> <p>125 species was recorded</p>		
Insecta			
Arachnida			
Copepoda			

Item	Description	Key management issues	Key stakeholders
Porifera	<p>Sponges, which constitute the phylum Porifera, are the most primitive of the multicellular animals. All members of the phylum are sessile and exhibit little detectable movement. Many sponges, like corals, contain symbiotic algal cells and are at least partly autotrophic. The number of Porifera species and genera reported from the Jordanian coasts of the Gulf of Aqaba are presented in Table 5.3.</p> <p>Sponges depend on their ability to filter large amounts of water through their bodies to survive. They provide habitats for many organisms and play a role in recycling calcium. Sponges are mostly beneficial to man and animals. Several sponge species</p> <p>e.g. Sigmosceptrella and Prianos produce compounds that show great promise as a drug to combat malaria, tuberculosis and other infectious diseases. Many compounds extracted from sponges have also anti-viral, anti-neoplastic and anti-cancer properties. There are 72 species of sponges known from the Jordanian coast of the...</p>		
CHAETOGNATHA	<p>The Chaetognatha, known as arrow worms, are common animals found in marine plankton. From the Jordanian side of Gulf of Aqaba, only four species representing two genera were recorded. These species are: Sagitta enflata, Sagitta...</p>		
UROCHORDATA	<p>Urochordata is a subphylum of the phylum Chordata. Adult urochordates are commonly known as tunicates. A total of 20 species were recorded from the Jordanian side of the Gulf of Aqaba. These species were divided among three classes as follows: Ascidiacea, 6 species; Larvacea, 8 species; and Thaliacea, 6 species.</p>		
Coastal infrastructures	Identify the main groups/category coastal infrastructures (e.g. ports; marinas; hotels; road network; urban areas; irrigation and drainage networks).	Identify the most important management issues (e.g. ecological problems/threats related to the given infrastructure) and try to associate them with the related "biophysical component" by listing each of them in the same line as...	Identify the most important stakeholders (e.g. institutional management, data provider, user of the infrastructure) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.
		<p>Since commercial shipping are vital to Jordan's economy, addressing that Aqaba is the only marine outlet for the country. Heavy investments in ports creation were performed by the government of Jordan where Ports Cooperation was developed</p>	

Item	Description	Key management issues	Key stakeholders
Sea Port		<p>Jordan where Ports cooperation was developed, and consists of: i) main port, ii) Aqaba Container Terminal (ACT) and the iii) industrial port. In 2012, the Aqaba Development Corporation (ADC); the main development corporation for the Aqaba Special Economic Zone Authority (ASEZA) initiated the relocation of the main port from its location northern of the Gulf of Aqaba to the Southern parts based on the master plan which was developed by Royal Haskoning (RH) in 2006. A study by Spurgeon, 2008 was conducted to assess the coral compensation due to the port relocation. The estimated areas of hard corals affected by direct impact based on this study is 32,509 m² based on the effects which will occur on Derreh Bay South (1,238 m²), Derreh Bay North (17,900 m²), Industrial Jetty (1,494 m²), Industrial Liquid Berth (481 m²), Phosphate Berth (3,152 m²), Grain berth (722 m²), and Grain berth and other miscellaneous liquids berth (7522 m²). Despite this information, but a major recommendation was made on the importance of establishing a comprehensive monitoring to establish the actual extent of such damages over time.</p> <p>Ports establishments contributes to the loss of hard corals through various means including the break of limestone and coral materials into extremely fine particles after dredging activities or the created sedimentation after landfilling activities over the construction phase. The sedimentation created including the milky white "clouds" of suspended sediments created by corals damage could stay in suspension for a long time and spread over a large area and result in significantly reduced light penetration, which will affect corals over a wide area, and might led to their death. Moreover, the industrial area affects corals and marine environment and coastal zone even during the operational phase where pollution caused from cargo and ship spills, ship grounding and anchor damages on corals, reduction in light impacts to corals resulting from ships regularly moored above them, and pollutant discharges from the outfall are primary cause of corals death or through ship spills and chemicals material spill e.g. ammonia, sulphate and cooling water, which cause decreeing or increasing the water pH or water temp.</p> <p>Oil floating on the water's surface can be deposited</p>	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department</p>

Item	Description	Key management issues	Key stakeholders
		<p>Oil floating on the water's surface can be deposited directly on corals in an intertidal zone when the water level drops at low tide. Rough seas can mix lighter oil products into the water column, where they can drift down to coral reefs. As heavy oil weathers or is mixed with sand or sediment, it can become dense enough to sink below the ocean surface and smother corals below. Despite the strict regulation at Aqaba, and the Zero Discharge policy, but few incidents of oil spill has been recorded.</p> <p>Based on the survey results, ASEZA has initiated coral transplantation efforts in 2012 where corals from the southern region of the coast and the Al Derreh area were placed at damaged reefs and a created cave site from cement and metal structures at Aqaba Marine Park</p> <p>ASEZA has been implementing a national monitoring program since the year 2002 to monitor the quality of seawater, coral reefs, benthic communities and fish. This ongoing program is implemented along the Jordanian Coastline through contracting with the Marine Science Station which belongs to the University of Jordan and Yarmouk University (Abu Awali et al., 2017).</p> <p>Also, the Marine Science Station conduct monitoring programs for water quality, sediment and biodiversity, with: AYLA Monitoring Program Phosphate Port Monitoring Program Royal Yacht Club Monitoring Program Talabay Monitoring Program Thermal Power Station Monitoring Program ACT Monitoring Program</p> <p>Each year ACT focuses on new opportunities to improve upon their environmental impact and sustainable socio-economic development, while continuing to operate the terminal with greater capacity and efficiency. In fact, in 2019 ACT was nominated as a finalist for Lloyd's List "Port Management and Infrastructure" award and was awarded the 2019 Workplace Health and Safety Award from the Social Security Corporation.</p> <p>In 2019, ACT managed to reduce its energy intensity by 12%, improve its water intensity by</p>	<p>Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>

Item	Description	Key management issues	Key stakeholders
		intensity by 13%, improve its water intensity by 9%, increase waste recycling by 5%, and decrease its total Greenhouse Gas (GHG) emissions intensity by 13.5%. These initiatives, in addition to the...	
Ayla Marinas	<p>Ayla's Marina provides 231 wet berths for vessels up to 40m long. Catering to both annual berthing members as well as monthly, weekly and daily visitors, Ayla's Marina is kitted out with best-in-class, international features, fittings, maintenance and services.</p> <p>Port Facilities & Services:</p> <p>Open throughout the year, our state-of-the-art Marina has all the facilities you could wish for:</p> <ul style="list-style-type: none"> Comprehensive daily boat checks 24/7 access to Marina Management Black & grey water-out dock Boat salt off Full CCTV monitoring, 24/7 control and security room Water, electricity and wifi access connection at every berth <p>Maintenance:</p> <p>In addition, maintenance services provided include:</p> <ul style="list-style-type: none"> Emergency Towing Double-loaded, side and mooring berths 118 dry stack berths, boats up to 12m Boat workshop Fuel dock Black and grey water pump-out Garbage collection... 	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>

Item	Description	Key management issues	Key stakeholders
Royal Yacht Club	<p>Participation of the club members in the jet ski boat skill racing activities, at times, exceeds fifteen (15) percent of club boating activities,</p> <p>The Royal Yacht Club of Jordan is a private membership driven club that supports and organizes water activities for all boats and ages. This club is located in the upper breakwater of Aqaba, Jordan. Each month many excellent events and races that target all ages and all yachting activities. Social dinners and luncheons build friendships and make the sailing more fun. Sharing and participation in boating and racing makes each member a piece of the notable history that is Royal Yacht Club of Jordan.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
New Public Marina	<p>ASEZA through the Aqaba Development Corporation, the developed arm, is building a dock, a dock for boats, and a fish market. The aim of the project is to provide a general aesthetic painting of the place that responds to the requirements of tourism and investment in it, and that the project extends along the waterfront of the entire Al-Hafayer area in the center of Aqaba, which is one of the most beautiful areas.</p> <p>The fishermen's port project will restore life to fishing boats that will rehabilitate and design their own port and create various new investment opportunities and contribute to the development of the local community by creating new job opportunities through the new fish market and the fishermen's marina.</p> <p>The basin will be near the waterfall, the central beach, with an area of 1270 square meters, and a building for the Fishermen's Association, and a boat maintenance workshop of 950 square meters.</p> <p>The project includes the construction of a multi-story car park and a 600-meter-long water channel with a distinctive heritage architectural design surrounded by green spaces and fed by seawater, as the channel will be adjacent to the main street...</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>

Item	Description	Key management issues	Key stakeholders
Old Ports	<p>Was located close to the town of Aqaba.</p> <p>It comprises (12) berths with a total length (2120) meter. These berths are used for handling general cargo, grain, phosphate export. These berths serve vessels of up to (70,000) tons displacement with a draft of up to 14.4 meters.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
The Middle Port	<p>It comprises (4) berths with a total length (1000) meter. These berths are used for handling Containers, Rice, livestock, Cement, Vega. oil, and Passengers.</p> <p>Mo'ta Berth: A floating berth of (150) meters long, (35) meters wide, (23) meters draft, receives vessels up to (53,000) tons displacement, serves the rice processing plant. And used for handling livestock.</p> <p>Moshterak Berth: Is a dolphin berth, (120) meters in length, (11) meters draft, receives vessels up to (100,000) tons displacement and equipped with a conveyor belt of (250) tons / hour a day for loading & unloading cement.</p> <p>Ro - Ro Berth: Ro - Ro berth: (40) meters long, (10) meters draft, and able the handle bow and stern-loading vessels of (35,000) displacement.</p> <p>Yarmouk Berth (Passenger Terminal): Identical to...</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>

Item	Description	Key management issues	Key stakeholders
Aqaba Container Port	<p>Strategically positioned at the crossroads of three continents and five countries, ACT is A joint venture between ADC and APM Terminals, part of A. P. Moller-Maersk Group, the Maritime industry leader.</p> <p>The services are powered by advanced terminal technology, equipment, and facilities, and provide customers with a complete package to facilitate their cargo operations. ACT has a reputation for efficiency and proficiency and provides speed, safety, security, and transparency across its service.</p> <p>Public Private Partnership: ADC and APM Terminals. Annual handling capacity: 1.3 million TEUs. Total Berth Length: 1000 m. Terminal Draft: 14.5 – 20 m.</p> <p>No. Of Berth: 1 Terminal draft: 24 m Terminal length: 140 m</p> <p>Terminal Overview</p> <ul style="list-style-type: none"> Terminal Area: 500,000m2 Stacking Area 450,000 m2 Electric reefer points: 800 plugs... 	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>
Passengers Port	<p>The Passenger Terminal located south of Aqaba Container Terminal, and due to the increasing volume of passenger traveling between Egypt and Jordan during the Haj season the need for the expansion and upgrade of the terminal and facilities emerged. ADC, has conducted the following developments: expansion and furnishing of terminal buildings, expansion of yards and stabling additional yards for Haj season uses.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>

Item	Description	Key management issues	Key stakeholders
Berenice Beach Club and Marina	<p>Extending more than 500 meters along the Aqaba coast, Berenice Beach Club is the only one of its kind which offers a mixed use with all year-round access. Set within the context of an authentically styled beach, it combines shopping, dining, entertainment along with the typical beach activities such as yacht cruises, water sports, snorkelling and diving.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
Talabay Marina	<p>TalaBay Marina is an international official port that can host up to 200 yachts/boats, complete with a harbor master building, fueling, maintenance, water and electricity supply, wireless internet, grey water pump-out and many other vessel services, as well as international entry and departure formalities.</p> <p>Tala Bay Marina and Berthing Information</p> <p>Tala Bay Marina lies within the 27km coastline of Jordan, 14km south of the city of Aqaba, within the 7km of Aqaba Marine Park.</p> <p>Tala Bay is an official port of entry for Jordan. Total Area = 30,000 m². Marina berths ≈ up to 80 – 85 boats/ yachts and 1 up to 50m. Draft = 3.5 m. VHF 77 Marine Band. Entrance Waypoint – N 29°24'32.82", E 34°58'8.22"Admiralty Chart 801 of 2006.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>

Item	Description	Key management issues	Key stakeholders
Proposed Iraq Oil Export Terminal	<p>Owner: Ministry of Energy and Mineral Recourses Capacity: 1 M. Barrel / Day No. Of Berth: 2 Status: Ongoing negotiations between the Iraqi Government and the Jordanian Government Project Components:</p> <ul style="list-style-type: none"> • Construction of two berths • Onshore installations and facilities • Metering station • Logistic yards • Oil pipeline 	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
LPG Port	<p>Developed by ADC, managed and operated by Aqaba company for ports operation and management (ACPOM), Liquefied Petroleum Gas Terminal is designed and constructed according to highest safety and environmental standards. This automated terminal delivers a smooth handling process of LPG. The operator: APCOM No. Of Berth: 1 Terminal draft: 11 m Terminal length: 185 m Annual handling capacity: 4 million tons.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>

Item	Description	Key management issues	Key stakeholders
Oil Terminal	<p>Aqaba Oil Terminal rehabilitated by ADC to meet international safety and environmental standards and increase its handling capacity to 20 million tons, handles crude oil, refined oil products and miscellaneous chemical liquids. The operator: APCOM No. Of Berth: 1 Terminal draft: 24 m Terminal length: 140 m Annual handling capacity: 20 million tons</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
Specialised Marine Services	<p>Operator: Aqaba Ports Marine Services Co Handling Type: 4 Tug Boats 3 Pilot / Mooring Boats No. Of Berth: 1 Length: 80 m. Depth: 8 m.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>

Item	Description	Key management issues	Key stakeholders
<p>Liquefied Natural Gas Terminal – Sheikh Sabah Al Ahmad Terminal (LNG)</p>	<p>LNG is a key component of Aqaba ports community. Develop by ADC and financed through a grant from the Kuwait Fund for Arab Economic Development, the terminal is significant to the kingdom's energy sector. Operator: NEPCO. No. of Berths: 1 Berth, 1 FSRU Terminal Draft: 18 – 20 m. Terminal Length: 281 m. Annual Handling Capacity: 715 mmscf/ day.</p>	<p>See Main Component Sea Ports for the Key Management issues</p>	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
<p>Phosphate Terminal</p>	<p>In 2010, a BOT Agreement was signed between Aqaba Development Corporation and Jordan Phosphate Mines Co. To Develop and Operate the New Phosphate Terminal. In 2013, the construction was completed, and the terminal is being operated.</p> <p>The scope of the project consists of constructing and operating a new Phosphate Marine Terminal and Storage Facility with a handling capacity of (4 Million tons to 6 million tons max.) of Rock Phosphate. Operator: Jordan Phosphate Mines Co. Handling Good: Phosphate. Total Capacity: 6 million tons/ Year.</p> <p>No. of Berths: 1 Berth Length: 250 m. Depth: 21 m</p>	<p>See Main Component Sea Ports for the Key Management issues</p>	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>

Item	Description	Key management issues	Key stakeholders
Industrial Port	<p>The Industrial Terminal rehabilitated and upgraded to meet highest safely and environmental standards, and recently equipped with an additional Jetty, handles industrial liquids and dry bulk including ammonia, fuel oil, sulfur, phosphoric acid, potash, fertilizers, di-ammonium phosphate and salt. Terminal's jetty is connected via conveying system and pipelines to the handling and storage facilities.</p> <p>Operator: JIPC. No. of Berths: 3 Berth Terminal Draft: 11.5 – 24 m. Terminal Length: 669 m.</p> <p>Annual Handling Capacity: 9 million tons/ Year.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
Marine Services	<p>APMSCO is a joint venture between ADC and SL Jordan (Smith Lamnalco and Jordan National Shipping Lines Company). It serves Aqaba ports' community through two state-of-the-art marine services facilities one of which is located as part of Aqaba New Port premises, while the second is dedicated for the LNG terminal.</p> <p>PPP: ADC, SL Jordan Services: Pilotage, Tugboats, Mooring, Linesmen, VTS, Slipway, Salvage, Towing. Fleet: 8 Tugboats, 2 Mooring, 2 Pilotage, 1 Launch.</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>

Item	Description	Key management issues	Key stakeholders
New Main Port	<p>The Aqaba Special Economic Zone master plan doubted in 2002 calls for the relocation of the Main port located adjacent to the city of Aqaba. Aqaba New Port is currently being developed at the Southern Industrial Zone. The New Port of Aqaba project (NPA) is considered one of the major economic projects that Aqaba Special Economic Zone Authority (ASEZA) and Aqaba Development Corporation (ADC) seek to implement within its master plan. It will contribute to the development of the city of Aqaba and convert it into a gateway for logistics and multi-modal transfer. Consequently, it will contribute to raising the capacity of the Jordanian ports, maximizing the logistic capacity of the ASEZ, boosting the economic sectors, and supporting the Jordanian market, and thereby contributing to the development of the Aqaba city and putting it in the middle of the spotlight, regionally and internationally, as a destination for investment and a tourist attraction center.</p> <p>Details of the project</p> <p>Location: South of Aqaba Zone.</p> <p>Project Description: Constructing comprehensive port facility for general cargo, RoRo & grain.</p> <p>Project consists of the following packages:</p> <p>Package 1: Marine Works</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>

Item	Description	Key management issues	Key stakeholders
Future Miscellaneous Liquids Terminal	<p>In order to accommodate the growth in importing crude oil, light products and miscellaneous liquids, ADC had defined the construction of miscellaneous terminal as an opportunity for the private sector participation in ports development and construction.</p> <p>The new terminal will be used to handle the following allowed products in sufficient quantities meeting kingdom's needs and transshipment activities for Chemical Liquid Bulk, Liquid Petroleum Gas LPG, White Products (oil derivatives), e.g., benzene and diesel, and Liquid substances of mineral & vegetable oils.</p> <p>A BOT agreement has been reached and signed with the investors in importing miscellaneous liquids.</p> <p>Operator: United Miscellaneous Liquid Terminal Company...</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management Ministry of Environment</p>
New Port Passenger Terminal	<p>Project Components:</p> <p>Construction of:</p> <ul style="list-style-type: none"> • Four new berths. • Land border crossing terminal. • Ferry Terminal. • Passenger buildings for departure and arrival. <p>Current Status:</p> <p>Under assessment and studies</p>	See Main Component Sea Ports for the Key Management issues	<p>ASEZA Marine Science Station JREDS Ben Hayyan- Aqaba International Laboratories Investors Marine Experts Decision Makers The Main Port General Security Services Royal Rangers Department Academic Institutions Royal Navy Force Jordan Marine Authority ADC ACT managed by APMT Customers Services Min. of Tourism Aqaba Company for Port Operation and Management...</p>
Economic activities	Identify the main sectors of economic activities (e.g. agriculture; livestock; industry; fisheries; aquaculture; energy production; transport; tourism).	Identify the most important management issues (e.g. ecological problems/threats related to the given economic activity) and try to associate them with the related "biophysical component" by listing each of them in the...	Identify the most important stakeholders (e.g. institutional management, data provider, economic actor) and try to associate them with the related "biophysical component" by listing each of them in the same line as that of the related component.
Tourism			

Item	Description	Key management issues	Key stakeholders
<input type="checkbox"/> North area			<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>
<input type="checkbox"/> Saraya	<p>Saraya: it has a monitoring programme.</p>	<p>Ecolabel certificate (blue flag – beach and water qualities-, green key). Around one million square metres in construction: apartment, beaches, aquapark, and so on. Five star hotels: impacts on local communities. They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee. Cooperation between the hotels and small businesses is difficult. Saraya and all the 5 start hotels: they have enough lifeguards, constantly present.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>

Item	Description	Key management issues	Key stakeholders
Ayla	Eyla: 17 Km of artificial beach in Aqaba, Artificial lagoons. Environmental management plan, env. Programme (involvement local communities), monthly water analysis.	<p>Ecolabel certificate (blue flag – beach and water qualities-, green key).</p> <p>Around one million square metres in construction: apartment, beaches, aquapark, and so on.</p> <p>Five star hotels: impacts on local communities.</p> <p>They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee.</p> <p>Cooperation between the hotels and small businesses is difficult.</p> <p>Saraya and all the 5 start hotels: they have enough lifeguards, constantly present.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA)</p> <p>The Royal Marine Conservation Society of Jordan (JREDS).</p> <p>Investors.</p> <p>Marine Experts (Universities and freelancers).</p> <p>Decision Makers.</p> <p>Local community.</p> <p>Arabs and Foreigners Tourists.</p> <p>Media - all forms.</p> <p>Royal Navy Force.</p> <p>Environmental Police.</p> <p>Marine science Station.</p> <p>Aqaba National Laboratories.</p> <p>For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>
Five star hotels		<p>Ecolabel certificate (blue flag – beach and water qualities-, green key).</p> <p>Around one million square metres in construction: apartment, beaches, aquapark, and so on.</p> <p>Five star hotels: impacts on local communities.</p> <p>They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee.</p> <p>Cooperation between the hotels and small businesses is difficult.</p> <p>Saraya and all the 5 start hotels: they have enough lifeguards, constantly present.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA)</p> <p>The Royal Marine Conservation Society of Jordan (JREDS).</p> <p>Investors.</p> <p>Marine Experts (Universities and freelancers).</p> <p>Decision Makers.</p> <p>Local community.</p> <p>Arabs and Foreigners Tourists.</p> <p>Media - all forms.</p> <p>Royal Navy Force.</p> <p>Environmental Police.</p> <p>Marine science Station.</p> <p>Aqaba National Laboratories.</p> <p>For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>

Item	Description	Key management issues	Key stakeholders
<input type="checkbox"/> South beach	<p>South beach corresponds with the Marine Protected Area. Small hotel.</p>		<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>
<input type="checkbox"/> Baranis		<p>Some of the hotels have blue flags and green keys. Low cooperation between local communities and hotels (referred to business competition and areas around the hotels where fishing is forbidden). They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee. All the 5 start hotels: they have enough lifeguards, constantly present.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>

Item	Description	Key management issues	Key stakeholders
Talabe	Five star beach 600m. Mega touristic project (2000m,)	Some of the hotels have blue flags and green keys. Low cooperation between local communities and hotels (referred to business competition and areas around the hotels where fishing is forbidden). They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee. All the 5 start hotels: they have enough lifeguards, constantly present.	Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.
Beach Hotels		Some of the hotels have blue flags and green keys. Low cooperation between local communities and hotels (referred to business competition and areas around the hotels where fishing is forbidden). They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee. All the 5 start hotels: they have enough lifeguards, constantly present.	Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.

Item	Description	Key management issues	Key stakeholders
Touristic Resort and Village		<p>Some of the hotels have blue flags and green keys. Low cooperation between local communities and hotels (referred to business competition and areas around the hotels where fishing is forbidden). They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee. All the 5 start hotels: they have enough lifeguards, constantly present.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>
Hotel		<p>Some of the hotels have blue flags and green keys. Low cooperation between local communities and hotels (referred to business competition and areas around the hotels where fishing is forbidden). They are not allowed to fish in the areas, the local boats and people cannot have access to beach and sea without paying a fee. All the 5 start hotels: they have enough lifeguards, constantly present.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Investors. Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. For the South beach: Ministry of Environment (MPA) and Civil Defence.</p>
Public Beach	<p>Public services (e.g. umbrellas, toilets). Local cafés are present in both the areas (north and south). Minimarket, touristic booths</p>	<p>Solid waste, main source of marine litter Misuse of public services (e.g. toilet; fires; parking areas). There is an existing infrastructure for the lifeguards, but not a working service yet ("We need to sustain the lifeguards"). Civil Defence present. A clinic inside the Navy (7 minutes from public beach), there are emergency services, but the people is not aware. Ambulance boats of Navy, close to dive sites and public beaches, located at the N and S beaches.</p>	<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. Civil Defence.</p>

Item	Description	Key management issues	Key stakeholders
North public beach			<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. Civil Defence.</p>
South public beach			<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. Civil Defence.</p>
Camping Area			<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. Civil Defence.</p>

Item	Description	Key management issues	Key stakeholders
Local Cafè			<p>Aqaba Special Economic Zone Authority (ASEZA) The Royal Marine Conservation Society of Jordan (JREDS). Marine Experts (Universities and freelancers). Decision Makers. Local community. Arabs and Foreigners Tourists. Media - all forms. Royal Navy Force. Environmental Police. Marine science Station. Aqaba National Laboratories. Civil Defence.</p>
Private touristic area	Private chalet for security purposes		<p>Marine science Station. ASEZA. Royal Navy Force. Owners.</p>
Diving activities	<p>30 dive centres 33 dive sites inside the Aqaba MPA 3 dive sites outside of Aqaba MPA</p>		<p>Dive Centres. Local community: NGO. Fishermen. Users. ASEZA. Decision makers. Ministry of Tourism. Royal Navy. Env. Police.</p>
Diving Centre			<p>Dive Centres. Local community: NGO. Fishermen. Users. ASEZA. Decision makers. Ministry of Tourism. Royal Navy. Env. Police.</p>

Item	Description	Key management issues	Key stakeholders
Diving Sites			Dive Centres. Local community: NGO. Fishermen. Users. ASEZA. Decision makers. Ministry of Tourism. Royal Navy. Env. Police.
Snorkeling			Dive Centres. Local community: NGO. Fishermen. Users. ASEZA. Decision makers. Ministry of Tourism. Royal Navy. Env. Police.
Water Sports	Jet sky Banana boat Parasailing Water skying Kitesurf Sailing boats Windsurf	Present in both areas (south and north) Kitesurf mainly in the South area.	Investors. ASEZA. Royal Navy. Touristic and Env. Police. Users. Maritime Commission.
Other touristic activities	Glass bottom boats Speed boats Pedal boats Yacht Submarine Transportation between Egypt and Jordan (Ferries) Aquapark Baggies	Ferries: very active line before pandemic, used by tourists and local people.	Boat Glass Owners Associations. Users. Investors. ASEZA. Royal Navy. Touristic and Env. Police. Maritime Commission.
Cruise ships		Ongoing project close to the old seaport	ASEZA ADC (Aqaba Development Company) Maritime Commission Ministry of Tourism) Royal Navy Touristic and Env. Police.

Item	Description	Key management issues	Key stakeholders
Aquarium	Located at the Marine Science Station		Marine Science Station. ASEZA. Users/Visitors. Ministry of Tourism. Jordan Tourism Board (JTB). Media. Local community.
<input type="checkbox"/> Archaeological sites	At least four sites in Aqaba: Aqaba Islamic City, Church, Aqaba Castle,, Included visits to Petra/ Wadi Rum, one of the destinations of cruise tourists.		Ministry Tourism. JTB ASEZA Department of antiquities. Visitors. Decision makers. Touristic and Env. Police.
Aqaba Museum			Ministry Tourism. JTB ASEZA Department of antiquities. Visitors. Decision makers. Touristic and Env. Police.
Security Point	Security point for the beach, managed by touristic police		Royal Navy. Touristic and Env. Police. Civil Defence. ASEZA.
Fisheries			
<input type="checkbox"/> Fishing activities			Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority Fishing Committee (ASEZA, Fisherman's Associations, JREDS, Academic Institutions, Min. of Agriculture and Navy) Min. of Tourism Security Sector

Item	Description	Key management issues	Key stakeholders
Industrial Fishing	Two association of fisherman (around 300 members) all the fishermen are certified by govern. and security sector. All has 3 licences or certificates (fishing, fishing boat, sailing license) The boat used are very traditional (3 to 6 mt. length). Simple fishing gear is used (fishing lines, cages, nets). Dynamite and toxins are not allowed. One landing area (north area of the gulf of Aqaba).	All fishing activities are during the day, night-time it is not allowed. Problems to collect the baits, limited fishing sites (too high density of fishing boats related to the area available), Weather conditions (wind direction 70% is N to S) now ASEZA and ADC create a new marina for the recovery of small boats. List of Policy and Regulations controlling fishing process.	Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority Fishing Committee (ASEZA, Fisherman's Associations, JREDS, Academic Institutions, Min. of Agriculture and Navy) Min. of Tourism Security Sector
Recreational Fishing (boats and visitors)	Pleasure boats Regulations over recreational and sport fishing in under ASEZA evaluation.	Control over recreational and sport fishing gears by Navy and ASEZA (only lines equipment is allowed). Only some species of fishes are catchable.	Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority Fishing Committee (ASEZA, Fisherman's Associations, JREDS, Academic Institutions, Min. of Agriculture and Navy) Min. of Tourism Security Sector
Sport Fishing	Certified Pleasure Boats can have guest or tourist for fishing activities, also including the fishing competitions activities. Max 2 or 3 big events.	Control over recreational and sport fishing gears by Navy and ASEZA (only lines equipment is allowed)	Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority Fishing Committee (ASEZA, Fisherman's Associations, JREDS, Academic Institutions, Min. of Agriculture and Navy) Min. of Tourism Security Sector
Illegal Fishing		Visitors and Local people use to fish from the beaches (also during the night). Uncontrolled fishing gears waste disposal. Destruction of corals due to unproper use of fishing lines.	Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority Fishing Committee (ASEZA, Fisherman's Associations, JREDS, Academic Institutions, Min. of Agriculture and Navy) Min. of Tourism Security Sector

Item	Description	Key management issues	Key stakeholders
☐ Fishing Facilities			Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority ADC (Aqaba Development Company) Min. of Tourism Decision Makers Security Sector
Fisherman Harbour	Fishermen boats are allowed to leave from the harbour only between sunrise and sunset. They need to inform the Navy regards their movements.		Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority ADC (Aqaba Development Company) Min. of Tourism Decision Makers Security Sector
Fish Markets	More than 20 local fish markets.	Fisherman association ask for the creation of a refrigerated storing area near to landing area (1 km far). Proposal of establish a tax for the imported fish from Egypt (subsidy to Jordan Industrial Fishermen).	Fisherman's Associations ASEZA Navy Environmental and Touristic Police Aqaba Governorate Maritime Authority ADC (Aqaba Development Company) Min. of Tourism Decision Makers Security Sector
☐ Fishing Sites			Navy ASEZA Security Sector Maritime Authority JREDS Fishery comity
Industrial Fishing Area	It is forbidden to fish in: Private security beach, port, all terminals, shallow coral reef, coral reef, inside 350mt. from Aqaba Protection Area, International/Regional Border (500mt.), Industrial area until Saudi Border, 150mt. from anchored ships.	Navy have the responsibility to control all the fishing activities.	Navy ASEZA Security Sector Maritime Authority JREDS Fishery comity

Item	Description	Key management issues	Key stakeholders
Recreational Boats	It is forbidden to fish in: Private security beach, port, all terminals, shallow coral reef, coral reef, inside 350mt. from Aqaba Protection Area, International/Regional Border (500mt.), Industrial area until Saudi Border, 150mt. from anchored ships.	Navy have the responsibility to control all the fishing activities.	Navy ASEZA Security Sector Maritime Authority JREDS Fishery comity