

Red Sea and Gulf of Aden Region

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1 About

1.1 Overview

The waters of the Red Sea and Gulf of Aden are famous for their natural beauty and outstanding biological diversity. The area has gained global importance providing habitats to a significant number of unique species. The region is rich in natural resources such as fishery and tourism industries, however, anthropogenic activities are threatening the marine and coastal ecosystems of the area. Activities such as; urbanization and coastal development, industries including power and desalination plants and refineries, recreation and tourism, waste water treatment facilities, power plants, coastal mining and quarrying activities, oil bunkering and habitat modification. Climate change and sea level rise is also a fast approaching danger for low-lying areas.

As a result of the growing concern for the environmental and human health the Action Plan for the Red Seas and Gulf of Aden was established in 1976 and later revised in 1995. In addition the participating states; Egypt, Jordan, Eritrea, Palestine, Saudi Arabia, Somalia, Sudan and Yemen adopted the Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention) and the Protocol concerning Regional Cooperation in Combating Pollution by Oil and other Harmful Substances in Cases of Emergency in 1982 which entered into force in 1985.

The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) was established in September 1995 under the umbrella of the Arab League. PERSGA is the coordinating body and is involved in the implementation of the Jeddah Convention and Protocol, and the Action Plan. PERSGA also has the responsibility for the preparation and implementation of the Strategic Action Programme (SAP) and its related activities.

The SAP was launched in 1999, funded through the Global Environment Facility (GEF) implementing agencies (UNDP, UNEP, World Bank), the Islamic Development Bank, and the PERSGA member states. Today SAP continues to provide a regional framework for continued cooperation on projects relating to the rational exploitation of living marine resources, public health, coordination of water management policies, development of oil spill contingency plans and drafting of guidelines for coastal area development schemes. The SAP focus's on three directions: land-based pollution, navigation and port improvements, and monitoring.

Future aims for PERSGA are working towards: having the region declared a 'Special Area' (according to MARPOL 73-78); the establishment and provision of adequate number of port reception facilities; identification of ports needing improvement in co-operation with the International Maritime Organisation (IMO) and the private sector; a regional pollution monitoring programme analysing contamination in seawater, sediments and indicator organisms; and sustainable development.

1.2 Key Dates

1974	A workshop organised by UNESCO in Bremerhaven, Germany, at the request of ALECSO. The Jeddah First Expert meeting to formulate a co-operative regional programme for environmental studies of the Red Sea and Gulf of Aden and to begin drafting a convention to protect the sea from pollution.
1976	The Jeddah II Conference approves an Action Plan for the Red Sea and Gulf of Aden, adopts a convention for the conservation of the marine environment, establishes regional mechanisms for implementing the convention, and initiates co-operative action to establish a monitoring network and a regional programme for scientific research.
1981	A meeting of legal and environmental experts is held in January to approve a new action plan, convention, and protocol for cooperation in combating oil pollution
1982	The Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention) is signed, along with the Protocol concerning Regional Cooperation in Combating Pollution by Oil and other Harmful Substances in Cases of Emergency and a revised Action Plan including a strong chapter on environmental management.
1995	Preparation of the Strategic Action Programme (SAP) for the Red Sea and Gulf of Aden is initiated in October with the first meeting of the SAP Task Force in Jeddah. The first meeting of the PERSGA Council of Ministers results in the Cairo Declaration, formally establishing the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA). 'Sea to Sea' Regional Conference on Sustainable Use of the Marine Environment is held in Jeddah by PERSGA/ROPME/ACOPS/ UNEP.
1996	Second meeting of the PERSGA Council of Ministers approves the SAP process and the recommendations and results of the SAP preparatory phase. A workshop on implementation of the Global Programme of Action in the ROPME sea area and the PERSGA region is held in Manama, Bahrain. First Expert Group meetings are held on the Regional Navigation Risk Assessment and Management Plan by PERSGA/World Bank.
1997	Second Expert Group meetings are held on the Regional Navigation Risk Assessment and Management Plan by PERSGA/World Bank The fourth SAP Task Force Meeting is held in Jeddah in May. The expert group on a PERSGA/GEF Regional Study on Status of the Living Marine Resources in the Red Sea and Gulf of Aden and Their Management.
1998	A regional training workshop on combating oil spills, Jeddah. A regional training workshop on ICZM, Port Said, Egypt. The revised SAP is formally set in motion following the Signing Ceremony.
1999 1999	An MoU is signed on between UNEP and PERSGA, ROPME and CAMRE for exchange of information regarding monitoring and public awareness, the avoidance of duplication and repetition of activities, and the achievement of integration with the activities of the UNEP Regional Office for West Asia. The First Task Force meeting of the revised SAP, Jeddah.

1.3 Geographic and General Information

Name of the Regional Seas Programme

Member states: Egypt, Jordan, Eritrea, Palestine (PLO), Saudi Arabia, Somalia, Sudan and Yemen (UNEP 2001)

Total Population: Approximately 172 million

Total sea area: Each State has an EEZ of 12 NM (except for Palestine)

Length of coastline: 11, 254 km

GWA Region: Subregion 49: Red Sea, Subregion 48: Gulf of Aden

Large marine Ecosystem: LME #33 Red Sea, LME #32: Arabian Sea

1.3.1 Oceanographic Information

The Red Sea has an average depth of 500m, with a maximum of over 2,000m, and is noted for some of the hottest (exceeding 30°C) and most saline (up to 46o/oo) seawater in the world (Behairy 1992). It has no permanent inflowing coastal rivers or streams, only brief torrents, occurring during flash floods in winter months. The Red Sea is partially isolated from the open ocean. It is located in an arid, tropical zone with sparse and varied rainfall amounting to as little as 10-15 mm/yr over the sea, a few millimetres per year along the coastline and up to 180mm at Suakin (19°N). These unique features have contributed to making the Red Sea vulnerable to the impacts of human activities. Currents in the Red Sea largely result from density gradients in the water column. Surface water density in the Red Sea rises with a fall in water temperature to the north and evaporation causing increased salinity. Decreasing temperatures and evaporation in the Gulf of Suez result in the formation of dense water that turns under and is returned southward in the deep Red Sea. In winter (September-June) surface water is driven into the Red Sea by prevailing winds from the Southeast, beneath which there is a deep outward flow of more dense, saline water. During summer, prevailing winds change to the Northwest, driving the upper water layer out of the Red Sea over a deeper inward flow from the Gulf of Aden. Net outflows are 10% higher in salinity, and balance the effects of evaporation in the Red Sea (Chiffings 2003). Tides in the Red sea are unusual, with central regions experiencing virtually no difference in tidal heights over a 24 hour period, but in the North and South, levels oscillate daily (reaching 0.6m in the N and 0.9m in S). There is also a seasonal trade with water levels being up to 0.5m higher during the winter months (Behairy 1992).

1.3.2 Coastal Geography and Geology

The main body of the Red Sea lies in a rift valley separating the African and Arabian plates. It is the Red Sea, a product of deep-ocean rifting, extends for 2,100km from Suez to the Strait of Bab el-Mandeb, which connects it with the Gulf of Aden and the Indian Ocean. Plateaus and mountains rise steeply to more than 1,000 m above sea level north of Jeddah and 3,660 m in Yemen. The coastal plain is from 2-50 km wide and slopes up gently to the east until it meets the mountains. The mountains are deeply cut by valleys but streams flowing in the uplands fail to cross the coastal plain to reach the sea. The Red Sea is 180 km wide in the North and widens to 350 km in the south, before narrowing to 28km in the strait of Bab el Mandeb where it joins the Indian Ocean

(Behairy 1992). The Gulf of Aqaba is 170 km long and 14-26 km wide and forms part of the Afro-Syrian Rift System with steep walls dropping to great depths (2,000 m in places). It is separated from the Red Sea by the 6-kilometer wide Straits of Tiran. The Gulf of Suez is a wide, shallow basin with an average depth of 20+30 m, with greater depths occurring in the central trough. The Red Sea has a barrier reef located 10-40 km off the coast of Saudi Arabia and is about 400 km long and several km wide. The seabed platform lies at a depth 30-60 m, on which sit many steep-sided patch reefs. Almost continuous marginal coral reefs occur along much of the coast from the Gulf of Aqaba to the Strait of Bab al-Mandeb. A similar description of the reef morphology also applies to the African side of the Red Sea (Chiffings 2003).

1.3.3 Ecosystem Diversity

Large areas of Sabkha are found in the United Arab Emirates, the Bar al Hiskmann peninsula in Oman, along the shores of the Gulf of Suez, and much of the Saudi Red Sea coast. Sabkha is a widespread inter- and supra-tidal habitat, measuring many kilometres across in places. It forms flat plains, with crusts of sodium chloride and gypsum, with important algal mats a few centimetres thick, beneath which is a black reducing layer. The mats are complex associations of cyanophytes, bacteria and diatoms. Pools are a special feature of sabkha. Those with subterranean connection with the sea have relatively high benthic diversity. With increasing isolation from the sea, diversity falls and the persistent microbial biota then forms a typical mat. These are highly productive and fix nitrogen. When desiccated in summer, mats become dry and crisp, breaking into characteristic polygons (Chiffings 2003).

1.3.3.1 Marshes and Wetlands

Salt marshes of the Shatt al Arab cover approximately 18,500 km². Eleven halophytic community types have been described, largely on the basis of elevation and periodicity of immersion. In places, reed vegetation is strongly enhanced by sewage enrichment, when it may reach heights of up to 5 m. In the Gulf and parts of the Red Sea (not the northern Red Sea), many new marsh communities are appearing as a result of sewage outfalls along the coast of Saudi Arabia and near Port Sudan. Enrichment not only stimulates marsh development, but in the case of the Red Sea, also adds significant nutrient loads. About 3 % of the Egyptian coast is comprised of saltmarsh. Saltmarshes in the northwestern Red Sea are located around Ras-Mohammed, Abu-Monqar, Wadi El-Gemal islands and Gebel Elba (Chiffings 2003).

1.3.3.2 Sandy and Rocky Shores

Most sandy shores in the northern Red Sea are narrow beaches adjoining narrow coral reef flats. Broader beaches occur where the reef edge swings further out from shore, leaving a lagoon. The diversity of rocky shores is significantly higher than that of sandy beaches or mud, although biomass may be less. 20% of the Egyptian Red Sea coast is formed by rocky, erosional, wave-cut cliffs. Much of the available rocky intertidal zone of the north occurs in erosion notches of fossil cliffs. These provide a more moist and sheltered habitat than do the horizontal expanses of intertidal rock that are common in the south and support a greater range of the fauna (Chiffings 2003).

1.3.3.3 Mangroves

The mangroves of Arabia include communities that grow on soft-bottom and hard-bottomed substrates, the latter being more prevalent in the northern Red Sea. Compared with other Indian Ocean mangroves, the number of mangrove and associated species in the Arabian Seas Marine Region is low, although most of the characteristic faunal zones are still present. Low diversity is attributed to the generally severe climatic and environmental conditions (such as high salinity), in conjunction with the more limited range of suitable habitats and niches. *Avicennia marina* grows in both types of substrates and is the dominant mangrove species, tolerating the high salinities and extremes of water temperature associated with this region. In the Red Sea, three other species are known but are uncommon. The northern latitudinal limit (27-28°N) of naturally occurring mangal ecosystems in both the Red Sea and Gulf is attributed largely to cold winter temperatures. Interactions between mangroves and adjacent ecosystems are probably greatest in the southern Red Sea and undoubtedly make a significant contribution to coastal productivity (Chiffings 2003).

1.3.3.4 Coral Reefs

The diverse and spectacular coral reefs for which the Red Sea is renowned are found only in its central and northern half. North of 20°N reefs are typically well developed and drop steeply into deepwater; south of 20°N, reefs occur in a shallow, turbid environment and are less developed. Greatest development occurs in offshore barrier reefs and in fringing reefs. Thinner reefs cover the Gulf of Aqaba and other northern shores. Well-developed reefs occur around the Farasan and Dahlak Islands, which also support extensive mangroves. Algal reefs occur in the southern Red Sea in low-energy conditions. They support dense brown algal cover and provide important hard substrate in otherwise sandy areas. A longitudinal series of coral reefs lie along the axis of the Red Sea on ridges resulting from normal faulting and upward movement of underlying salt deposits. These are widespread in the Red Sea. Atolls are also numerous and are found mostly on the ridges. Diverse reefs are found between Ras Shukhei and Quseir along the Egyptian coast and in the area of Ras Mohammad and the Straits of Tiran. There is a fairly distinct Arabian coral species grouping. Within it, there is a single, principal division into a Red Sea group, and a Gulf of Oman/Arabian Sea group, which then fuses with the Gulf. In the Red Sea there are 13 principal coral communities. Most show considerable localisation correlated with latitude but linked with gross changes in coastal bathymetry and morphology. On any one reef in the Red Sea, the general pattern of coral diversity with depth follows that of most Indo-Pacific reefs, rising to a maximum depth of 5-20 m deep before declining. Coral cover is usually less than 50 %, but in sheltered areas one or two species, especially *Porites*, may cover 80 % of the substrate (Chiffings 2003). The Gulf of Aden despite upwelling water and sandy shorelines supports surprisingly rich and complex reefs (Behairy 1992). There are 194 species of corals recorded along the Saudi Arabian coast. About 30 coral species have been recognized in the Gulf of Aqaba, about 80 near Jeddah, less than 50 near Al Birk, and less than 10 on the southernmost Saudi inshore reefs. Five areas along the Saudi coast are noted for their extensive coral reefs: the Tiran islands area, Wejh bank, the area north of Yanbu, the coastline between Obhur and Thuwal, north of Jeddah; and the outer

Farasan bank. The number of coral-reef species in the southern Red Sea and the Gulf of Aden is estimated to be around 130 species.

1.3.3.5 Seagrasses

Ten seagrass species are known in the Red Sea. Seagrass beds generally attain greatest development in the south of the Red Sea. The seagrass distribution and diversity of the Pakistani coast is not well described at this time. Highest biomass is associated with *Thalassodendron ciliatum*, *Thalassia hemprichii* and *Syringodium isoetifolium* (Chiffings 2003).

1.3.3.6 Upwellings

In summer, prevailing winds flow down the Red Sea for its entire length, reinforcing the clockwise airflow in the Arabian Sea. This generates strong south-westerly winds, leading to cool, nutrient-rich upwelling. Upwellings result in higher nutrients and the development of Ecklonia kelp beds in places, inhibiting the development of coral reefs (Chiffings 2003).

1.3.4 Species Diversity

1.3.4.1 Seaweeds

There are extensive areas dominated by macroalgae on both reefs and other substrates. Green and red types of algae are ubiquitous, the latter including some species that grow deeper in the Red Sea than anywhere else due to their utilization of blue light and energy-conserving growth patterns. Calcareous red algae are mainly restricted to very shallow areas. For many species, vigorous water movement is essential, although dense algal growth also occurs on unconsolidated substrate, helping to stabilize it. Nearly 500 species of algae have been recorded from the Red Sea (Chiffings 2003).

1.3.4.2 Invertebrates

Of the 452 known Indian Ocean phytoplankton dinoflagellates, 88 species are found in the Red Sea. The decline westward in the Red Sea is partly compensated by the presence of several endemics and by blooms of *Oscillatoria erythraeum*. Phytoplankton densities similarly decline westward. While the trend is similar in winter and summer, winter phytoplankton counts are one to two orders of magnitude greater. There is a large input of mesoplankton from the Gulf of Aden at peak times of influx, though most do not survive beyond the central Red Sea. Primary productivity of the Red Sea is highest in the south. In the very clear Gulf of Aqaba, significant production continues to depth of about 200 m (compared to 40 m in the Arabian Sea). Summer values are approximately half those of winter (Chiffings 2003).

Zooplankton diversity declines westward. Peak numbers throughout the Red Sea lag a few weeks behind those of phytoplankton. Calanoid copepods are the most important group 60 in the southern Red Sea, and 46 in the north. Euphausiids are important in terms of biomass, although of 22 Indian Ocean species, only 10 occur in the Red Sea. There is marked vertical stratification of zooplankton in the Red Sea. Peak diversity and abundance remain within the photic zone, but a secondary maximum is found near the oxygen minimum layer at 400-m. Close to shore, demersal zooplankton and larvae of reproducing invertebrates tend to dominate measurements of numbers and productivity (Chiffings 2003).

1.3.4.3 Fish

There are marked differences throughout the Arabian Seas Region in the structure and composition of fish assemblages, reflecting the heterogeneous nature of the environment. The most diverse assemblages occur within the Red Sea with a total of approximately 1,000 species present (including nonreef species). Within the Red Sea there are major differences in assemblage composition between areas north and south of latitude 20-N. This may be due to the differences in reef habitat between these areas or differences in water quality, particularly the limit of penetration by nutrient-rich water from the Gulf of Aden (which occurs at around 20-N), and north-south gradients in temperature, salinity and turbidity. The Gulfs of Aqaba and Suez support distinctive fish assemblages. Those of the Gulf of Suez share greater affinities with southern Red Sea assemblages than with the Gulf of Aqaba, probably due to its shallow, turbid nature. The Gulf of Aden marks a division between a fauna dominated by Red Sea species to one dominated by Indian Ocean species in the Gulf of Oman and the Gulf. Upwelling of cold water in the Arabian Sea appears to provide this major biogeographic barrier. Compared with the Red Sea, reefs of the Gulf and Gulf of Oman support low-diversity fish assemblages. This probably reflects the scarcity of reef habitat and the extreme environmental conditions (Chiffings 2003).

1.3.4.4 Marine Reptiles

Sea snakes do not occur in the Red Sea (Chiffings 2003). Species of marine turtles that have been recorded in the Red Sea are the Hawksbill turtle *Eremochelys imbricata*, Green turtle, *Chelonia mydas*, Leather back, *Adenturtle Dermochelys coriacea*, and Logger headturtle, *Caretta caretta*. The green turtle and the hawksbill are the abundant within the region with an study estimated population of both species at around 3500 individuals. All marine turtles, except for the loggerhead turtle, are on the list of endangered species of the IUCN - World Conservation Union. The hawksbill is evidently the most abundant of the Red Sea turtles, with records from every country but Jordan. Nesting is also widely reported but most commonly from islands. The Dehlah Archipelago, in Eritrea, was found to have nesting. The Sudan's Suakin Archipelago may have some of the most concentrated nesting anywhere. Nesting along the Egyptian coast from RAS Banas to islands at the mouths of the Gulfs of Suez and Aqaba, such as Gubal el Kebir and Tiran Nesting spoor, probably of this species, has been seen on islands along the coast of Saudi Arabia, and there is likely to be nesting on Yemeni islands, for the species is common there each year. Thousands of green turtles nest in

South Yemen along the shores of the Gulf of Aden; and some tagged females from there have been recaptured in Somalia, more than 2000 km away. Some of these turtles may move between the Gulf of Aden and the Red Sea (Chiffings 2003).

1.3.5 Information on Participating States

1.3.5.1 Egypt

Total Population: 74,718,797 (CIA 2003)

Total GDP: purchasing power parity - \$268 billion (CIA 2003)

Total sea area:

contiguous zone: 24 NM

territorial sea: 12 NM

continental shelf: 200-m depth or to the depth of exploitation

exclusive economic zone: 200 NM

Length of coastline: 2,450 km (CIA 2003)

Marine protected Areas:

- Abu Gallum Multiple Use Management Area
- Gebel Elba Conservation Area
- Nabq Multiple Use Management Area
- Ras Mohammed National Park
- Ras Mohammed Sector, additional marine areas:
- Tiran-Sanafir Islands Protected Area

Proposed New MPAs

- Tiran Islands Area (Egypt, Saudi Arabia)
- Straits of Gubal (Egypt)
- Southern Egypt (proposed) Marine Park: Mersa Alam, Sudanese Border (Egypt)

(Chiffings 2003).

1.3.5.2 Eritrea

Total Population: 4,447,307 (CIA 2003)

Total GDP: purchasing power parity - \$3.3 billion (CIA 2003)

Total sea area: territorial sea: 12 NM (CIA 2003)

Length of coastline: 2,234 km total; mainland on Red Sea 1,151 km, islands in Red Sea 1,083 km (CIA 2003)

1.3.5.3 Palestine

Total Population: 1,274,868 (CIA 2003)

Total GDP: purchasing power parity - \$735 million (CIA 2003)

Total sea area: Israeli-occupied with current status subject to the Israeli-Palestinian Interim Agreement - permanent status to be determined through further negotiation.

Length of coastline: 40 km (CIA 2003)

1.3.5.4 Jordan

Total Population: 5,460,265 (CIA 2003)

Total GDP: purchasing power parity - \$22.8 billion (CIA 2003)

Total sea area:

territorial sea: 3 NM

Length of coastline (total and per country) 26 km (CIA 2003)

1.3.5.5 Saudi Arabia

Total Population: 24,293,844 (CIA 2003)

Total GDP: purchasing power parity - \$242 billion (CIA 2003)

Total sea area:

contiguous zone: 18 NM

continental shelf: not specified

territorial sea: 12 NM

Length of coastline (total and per country) 2,640 km (CIA 2003)

Marine protected Areas:

- Farasan Islands Protected Area
- Um Al-Qamari Island Protected Area

Proposed New MPAs

- The Persian Gulf, Gulf of Salwa
- Farasan, Gizan Area, Red Sea
- Tiran Islands Area
- Wejh Bank
- Qishran Islands-Ras al Askar
- Ras Suwahil

(Chiffings 2003).

1.3.5.6 Somalia

Total Population: 8,025,190 (CIA 2003)

Total GDP: purchasing power parity - \$4.1 billion (CIA 2003)

Total sea area:

territorial sea: 200 NM

Length of coastline (total and per country) 3,025 km (CIA 2003)

Coastal and Marine Protected Areas

There are currently no MPAs and no legislation concerning their establishment and management, although the WCMC Protected Areas Database lists Bushbush Game Reserve as an MPA

Proposed New MPAs:

- Bajuni Archipelago and adjacent coastal area
- Maydh Island

(Gaudian *et al*, 2003).

1.3.5.7 Sudan

Total Population: 38,114,160 (CIA 2003)

Total GDP: purchasing power parity - \$52.9 billion (CIA 2003)

Total sea area

contiguous zone: 18 NM

continental shelf: 200-m depth or to the depth of exploitation

territorial sea: 12 NM

Length of coastline (total and per country) 853 km (CIA 2003)

1.3.5.8 Yemen

Total Population: 19,349,881 (CIA 2003)

Total GDP: purchasing power parity - \$15.7 billion (CIA 2003)

Total sea area:

contiguous zone: 24 NM

territorial sea: 12 NM

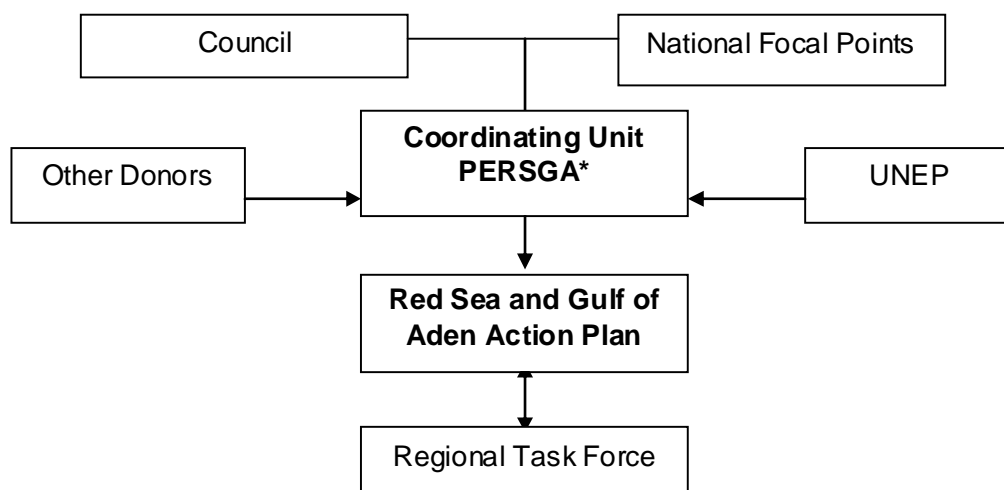
continental shelf: 200 NM or to the edge of the continental margin

exclusive economic zone: 200 NM

Length of coastline (total and per country) 1,906 km (CIA 2003)

1.4 Organization

1.4.1 Institutional Structure



PERSGA*: Red Sea and Gulf of Aden Environment Programme

1.4.2 Council

The Council governs environment affairs in each of the seven PERSGA member states. The Council meets annually to approve technical and financial policies.

Last Meeting: to come

Next Meeting: to come

Country	Ministry	Contact Details
Djibouti	Minister of Habitat, Urbanization, Environment and Land Management	P.O.Box 11 Djibouti +203350006
Egypt	Minister of State for Environmental Affairs	30 Misr Helwan El-Zyrae Rd., Maadi, Cairo, Egypt P.O.Box 11728 Cairo +2025256463
Jordan	Minster of Municipal, rural and Environmental affairs	P.O.Box 1408 Amman 11941 Jordan +96265350149
NE Somalia	Ambassador of Somali in KSA	P.O.Box 94372 Riyadh 11693 K.S.A. +96614643456
NW Somalia	Ambassador of Somali in KSA	P.O.Box 94372 Riyadh 11693 K.S.A. +96614643456
Saudi Arabia	Presidency of Meteorology & Environment PME	P.O.Box 53662 Jeddah 21583 Kingdom of Saudi Arabia +96626512312
Sudan	Minister of Environment and Physical Development	P.O.Box 10488 El Gama'ah St., Khartoum, Sudan +24911784279
Yemen	Minister of Tourism and Environment	P.O.Box. 19719 Sana'a Yemen +9671202019

(PERSGA 2004)

1.4.3 National Focal points

The national focal points focus on the implementation of PERSGA activities in the seven member states.

Country	Organization	Contact Details
Djibouti	Ministry of Habitat, Urbanization, Environment and Land Management	P.O.Box 11 Djibouti +253-350006
Egypt	Egyptian Environmental Affairs Agency EEAA	30 Misr Helwan El-Zyrae Rd., Maadi, Cairo, Egypt P.O.Box 11728 Cairo +20-2-5256450
Jordan	Aqaba Special Economic Zone Authority ASEZA	P.O.Box 2565 Aqaba 77110, Jordan +962-3-2091000
NE Somalia	Somali Embassy in Riyadh	P.O.Box 94372 Riyadh 11693 K.S.A. +966-1-4643456
NW Somalia	Somali Embassy in Riyadh	P.O.Box 94372 Riyadh 11693 K.S.A. +966-1-4643456
Saudi Arabia	Presidency of Meteorology & Environment PME	P.O.Box 53662 Jeddah 21583 Kingdom of Saudi Arabia +966-2-6512312
Sudan	Higher Council for Environment & Natural Resources HCENR	P.O.Box 10488 El Gama'ah St., Khartoum, Sudan +249-11-784279
Yemen	Environment Protection Authority EPA	P.O.Box. 19719 Sana'a Yemen +967-1-202019

(PERSGA 2004)

1.4.4 Coordinating Unit

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

PERSGA is responsible for the development and implementation of regional programmes for the protection and conservation of the marine environment of the Red Sea and Gulf of Aden, and was formally established in September 1995, with the signing of the Cairo Declaration by all co-operating parties to the Jeddah Convention. PERSGA is governed by a Council including ministers handling environment affairs portfolios in each of the seven PERSGA member states. PERSGA's daily affairs are managed by a

secretariat run by a team of professionals recruited from various countries in the region (PERSGA 2004)

Major functions: include the implementation of the Jeddah Convention, the Action Plan, and the Protocol. It has also been given responsibility for preparation and implementation of the SAP and related activities. PERSGA has played an active role in promoting regional co-operation and has recently supported regional workshops concerning environmental assessment, Marine Protected Areas, navigation risks and living marine resources. In addition, a series of national workshops have been sponsored by PERSGA to facilitate the development and review of Country Reports prepared as part of the Strategic Action Plan process (PERSGA 2004)

Headquarters:

Red Sea and Gulf of Aden Environment Programme (PERSGA)

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1.4.5 Secretariat

The secretariat manages the activities of PERSGA. The Kingdom of Saudi Arabia currently hosts the PERSGA Secretariat and its headquarters in Jeddah. The PERSGA team was first based in Cairo before moving to Tunis and finally settling in Jeddah.

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Secretary & Operator	Ibrahim Omar Ext. 0 & 260

(PERSGA 2004)

1.4.6 Strategic Action Programme

The Strategic Action Programme (SAP) was launched in 1999, funded through the Global Environment Facility (GEF) implementing agencies (UNDP, UNEP, the World Bank), the Islamic Development Bank, and the PERSGA member states.

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Component 4-Habitat and Biodiversity Conservation (HBC)		
Lead Specialist	Abdullah Al-Suhaibany	Abdullah.alsuhaibany@persga.org Ext. 204
Component 5-Development of a Regional Network of Marine Protected Areas (MPA)		
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Component 7-Public Awareness and Participation (PAP)		
Lead Specialist	Khulood Tubaishat	<u>Khulood.tubaishat@persga.org</u> g Ext. 239

(PERSGA 2004)

1.4.7 Regional Task Force

In each of the PERSGA member countries, the Government has appointed a member to a regional Task Force. The Task Force members represent their respective Governments and their commitments to the Red Sea/Gulf of Aden Convention and act as the overall National Focal Point for PERSGA activities. The Task Force serves as the technical advisory body to PERSGA regarding implementation of the SAP. It guides and oversees the Project, provide strategic decisions, review and assess the overall thrust of Project progress, provide technical and political support and facilitate Project implementation in the respective countries. The Task Force is the forum whereby co-operation among participating countries, international financial institutions and donors is enhanced (PERSGA 2004).

For a full list SAP Task Force Members of link to:
<http://www.persga.org/about/projects/SAP/taskforce.asp>.

1.4.8 Financial Arrangements

Trust Fund: to come
State Contribution: to come

Other: [blank]

1.5 Partners

CEDARE

The Centre for Environment and Development for the Arab Region and Europe (CEDARE) established within the Arab Region and Mediterranean Europe, to become a Centre of Excellence which can assist the region in its efforts to pursue global environmental trends and support national programme efforts in the implementation of Agenda 21, through fostering their national capacities. CEDARE Programmes include:

- Environmental Information Unit
- Land and Water Resources Management Programme

- Urbanization and Human Settlement Programme
- Marine and Coastal Resources Management Programme
- Socio-Economics For Sustainable Development Programme

<http://www.cedare.org.eg/about/about.htm>

International Centre for Living Aquatic Resources Management, ICLARM

An international research organization "devoted to improving the productivity, management and conservation of aquatic resources for the benefit of users and consumers in developing countries".

http://www.dec.ctu.edu.vn/cdrom/cd6/projects/iclarm_1197/index-1.htm.

International Coral Reef Initiative, ICRI

An environmental partnership that brings stakeholders together with the objective of sustainable use and conservation of coral reefs for future generations.

www.icri.org.uk

Coral Health and Monitoring Programme, NOAA

The mission of the NOAA Coral Health and Monitoring Program is to provide services to help improve and sustain coral reef health throughout the world. Long term goals: Establish an international network of coral reef researchers for the purpose of sharing knowledge and information on coral health and monitoring. Provide near real-time data products derived from satellite images and monitoring stations at coral reef areas. Provide a data repository for historical data collected from coral reef areas. Add to the general fund of coral reef knowledge.

<http://coral.aoml.noaa.gov/index.html>.

Global Environment Facility (GEF)

GEF plays a major role in funding projects within the Red Sea and the Gulf of Aden region. Some of the major ongoing projects are listed below:

- UNDP/GEF: International waters: Protection of Marine Ecosystems of the Red Sea Coast of Yemen
- UNDP/UNEP/World Bank/GEF: International waters: Implementation of the Strategic Action Programme (SAP) for the Red Sea and Gulf of Aden
- World Bank/GEF: International Waters: Gulf of Aqaba Environmental Action Plan
- World Bank /GEF: Biodiversity: Red Sea Coastal and Marine Resource Management, Egypt
- UNDP/GEF: Biodiversity: Conservation Management of Eritrea's Coastal, Marine and Island Biodiversity

www.gefweb.org

2 Our Work

2.1 Programme Strategy

Link to Regional Seas Strategic Direction: to come

2.2 Action Plan

Action Plan for the Conservation of the Marine Environment and Coastal Areas of the Red Sea and the Gulf of Aden

Adopted: 1976

Revised: 1995

Participating Countries: Egypt, Eritrea, Jordan, Palestine (PLO), Saudi Arabia, Somalia, Sudan and Yemen (UNEP 2001)

Text of the Action Plan <http://www.unep.ch/seas/main/persga/redap.html>

A new Strategic Action Plan was launched in 1999.

Strategic Action Programme for the Red Sea and Gulf of Aden

Goal: To provide a framework for the long-term conservation of the unique habitats of the Region and to promote the sustainable management of renewable marine resources.

For further information link to: <http://www.persga.org/about/projects/SAP/Overview.asp>.

2.3 Convention

Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment

Short title: Jeddah Convention

Year adopted: 1982

Year entered into force: 20th August 1985

Contracting Parties: Egypt, Eritrea, Jordan, Palestine (PLO), Saudi Arabia, Somalia, Sudan and Yemen. NB. Eritrea has not ratified the Convention (UNEP 2001)

Objective: is to ensure conservation of the environment of the Red Sea and Gulf of Aden by the promotion, on a regional basis, of environmental protection and natural resources management in the marine and coastal areas of the region.

Depositary state: Saudi Arabia

For full text of the Convention link to:

<http://www.persga.org/about/history/Jeddah/Jeddah.pdf>

Protocols:

Concerning Regional Co-Operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency

Year adopted: Jeddah, 14 February 1982

Year entered into force: 1985

For full text of the protocol link to:

<http://www.persga.org/about/history/Protocol/Protocol.pdf>.

2.4 Issues and Threats

2.4.1 Coral reefs

In 1997-98 the region's reefs suffered, to varying degrees, from the worldwide, coral bleaching event. Bleaching was patchy along the Saudi Arabian coast, being more severe to the south. In Sudan, bleaching occurred at several locations, above all south of Port Sudan (Pilcher 2000). In Eritrea, some coral bleaching and die-off was reported, predominantly from shallow waters, but recovery appeared to be fast. Along the Red Sea coastline of Yemen, where reefs are already under considerable human-induced stress, effects of coral bleaching were severe. Many areas of the Gulf of Aden were affected by bleaching. In Somalia, almost all corals in an area east of Berbera were killed, whereas further west, corals were only slightly affected. In Yemen, many corals along the shoreline died, and more than half of the corals of the Socotra Archipelago were affected by the bleaching (Pilcher 2000).

Corals have been mined for construction purposes in several countries including Sudan and Saudi Arabia, broken into manageable sizes or crushed for the manufacture of cement and lime. Corals are also collected for use in the ornamental trade as curios, souvenirs, or as jewellery. The aquarium industry is also responsible for the coral collection, either for direct sale as live colonies or through the process of fish collecting (Pilcher 2000).

Destructive fishing pressures are taking their toll on coral reefs. Today this is done with the use of home-made explosives composed of fertiliser, fuel and fuse caps inserted into empty beer bottles. Blast-fishers hunt for schooling fish such as sweetlips and fusiliers, which aggregate in groups in the open or hide under large coral heads. The bombs are usually dropped into the centre of an area judged to have many fish and after the bomb has exploded the fishermen use dip nets to collect the stunned and dying fish. Blast fishing also damages corals (Pilcher 2000). Once the reef structure has been weakened or destroyed by blast fishing it is much more susceptible to wave action and the reef is unable to maintain its role in coastline protection. Larvae do not settle on rubble and thus replenishment and rehabilitation is minimal. The recovery of such areas has been measured in decades, and only then with complete protection and cessation of fishery pressure of any kind. One of the most destructive fishing methods involves the use of cyanide. An aqueous solution of sodium cyanide or other chemical is squirted at fish to stun them, after which they are collected and sold to the live-fish trade. In the process of stunning the fish, the cyanide affects corals, small fish and invertebrates. Also among destructive fishing practices are normal trawl and purse fishing operations, when these take place close to or over reefs. Spear fishing may also damage corals if fishermen trample and break coral to get at fish that disappear into crevices (Pilcher 2000).

Pollution also has a huge impact on corals through the uncontrolled and often unregulated discharge of a number of industrial and domestic effluents. Many of these

are 'point-source' discharges that affect localised reef areas, rather than causing broad-scale reef mortality. The release of fluids high in organic matter or nutrients, such as sewage or abattoir refuse can lead to a phenomenon known as eutrophication. Untreated and partially treated sewage is often discharged where fringing reefs are located close to shore, such as the reefs that fringe the length of the Red Sea. Raw sewage can also result in tumours on fish, and erosion of fins from the high concentrations of bacteria that develop (Pilcher 2000). Petroleum hydrocarbons from the oil industry have also caused widespread damage to coral reefs. The levels of oil and its derivatives in the marine environment (many of which are persistent carcinogens) have been correlated with coral diseases in the Red Sea, especially Black Band Disease. Drilling activities frequently occur near reefs, such as along the Saudi Arabian shoreline in the Arabian Gulf. Drilling mud can suffocate reefs and it also contains compounds that disrupt growth and cause diseases. Discharges result in an increase in diatoms (algae) and a decrease in marine fauna in their vicinity. Many millions of tonnes of oil are transported through the region each year. Oil spills affect coral reefs through smothering, resulting in a lack of further colonization. There have been more than 20 oil spills along the Egyptian coast since 1982 (Pilcher 2000). Other anthropogenic impacts that result in the destruction of coral include tourism and coastal development.

For more information refer to:

Behairy, A.K.A., Sheppard, C.R.C., and El-Sayed, M.K. (1992) A Review of the Geology of Coral Reefs in the Red sea. UNEP Regional Seas Reports and Studies
Al Sanbouk No 12 (2000), Regional Coral Bleaching
Vogt, H. (2000) Coral Reefs and Coral Bleaching in the Region, Reefs in the Red Sea and Gulf of Aden. Al Sanbouk No 12, 2000
Schmid, H. (2000) Paradise in Peril. Al Sanbouk No 12, 2000
Pilcher, N. J. (2000) Coral and Human Disturbance. Al Sanbouk No 12, 2000

2.4.2 Mangroves

The development of coastal recreation facilities and coastal villages in the Ras Hatiba area north of Jeddah, shrimp aquaculture along the southern Red Sea coast and extensive landfill operations in Tarut Bay and Qatif Island and the Gulf War oil spill in Mardumah Island and Tanajib in the Eastern Province have all contributed to decline of the region's coastal mangroves. Mangrove systems are a valuable and ecologically significant habitat with many uses to humans. The high productivity sustained through detrital food chains contributes to resident and migratory animals and birds and to trophic balances in associated ecosystems (Pilcher 2000).

For more information refer to:

Schmid, H. (2000) Paradise in Peril. Al Sanbouk No 12, 2000
Pilcher, N. J. (2000) Coral and Human Disturbance. Al Sanbouk No 12, 2000

2.4.3 Turtles

A significant reduction in numbers of turtles from overexploitation has taken place. All the marine turtles of the region are considered threatened and both the green and hawksbill are declared endangered species.

2.4.4 Dugongs

Dugong distribution in the Red Sea is not continuous; populations are found in isolated channels and bays. They are rare but occasionally reported from the Gulf of Aqaba, scarce in the Gulf of Suez, reported regularly but are not common in the Sudanese Red Sea, and are very rare along the Eritrean coast. In Saudi Arabia the distribution of dugongs is concentrated in three locations: the Wejjh Bank, the Al-Lith area, and the Gizan area. At present dugongs are not deliberately targeted by fishermen from Egypt, Saudi Arabia or Yemen. If however they are accidentally caught in nets, their meat is eaten. This also occurs in Sudan and Eritrea where it is said that 'the meat is so tasty it cannot be differentiated from cow's meat'. In Egypt dugong skin has been used in the manufacture of shoes. In Sudan dugongs have, in the past, been hunted from small boats. While the flesh was consumed, the tough skin was also utilized, being used to cover the shields of some of the local Beja tribesmen. When the skins become dry, they are as hard as stone (Nasr 1999).

For more information refer to:

Nasr, D. (1999) Dugongs in the Red Sea and Gulf of Aden. *Al-Sambouk* No. 10, October 1999.

2.4.5 Exploitation of Fisheries

Over 74% of the annual Red Sea landings come from the southern section between Al Lith and the Yemeni border. Most species of butterfly fish and damsel fish are abundant in the central Red Sea; some Red Sea/Indo-Pacific species are rare in the southern region; e.g., *Chaetodon trifasciatus*, *Pomacanthus imperator*, *Pygoplites diacanthus*. These species are either coral or springe-feeders, and rely on well-developed coral reefs common in the central and northern Red Sea and the Gulf of Aqaba.

Special protective measures are necessary for reefs of the central Red Sea and the Gulf of Aqaba, where the butterfly fish are most common, and for Aynunah Bay, home for many damsel fish and the only recorded northern locality for *Pristotis cyanostigma*, an endemic damsel fish.

Until 1981, Saudi Arabia's fishery was exploited almost exclusively by artisanal fishermen from small boats and larger (up to 20 m). After 1991, an industrial fishery began, which has grown to a point where the largest company, Saudi Fisheries, currently lands around 1500mt of shrimp and a similar amount of finfish.

Productivity of the shelf adjacent to Tuwwal along the Saudi coast was estimated to be about 0.38 and 0.41-t/sq km in 1982 and 1983 respectively.

Many shallow water species (typically found between depths of 10 and 50 m) occur closer to the surface in the Gulf of Aqaba than further south in the Red Sea. For example, the butterfly fish *Chaetodon paucifasciatus* is usually found deeper than 15 m in the central Red Sea, but occurs right up to the surface in the Gulf of Aqaba. The

fishing industry in Aqaba is small and artisanal, consisting in 1995 of approximately 85 fishermen and 40 boats.

The total saleable catch in 1995 was an estimated 15 tonnes, with a value of 45,000 Jordanian dinars. This represented a significant drop from the 1993 catch of 105 tonnes, and was well below the largest registered catch of 194 tons in 1966.

In Yemen, the main exports of the fisheries sector include the crustacean shrimps from the Red Sea, mainly *Penaeus semisulcatus* and *P. indicus*, and from the Gulf of Aden the rock lobsters *Panulirus homarus* and *P. versicolor*, and the deep-sea lobster *Periurus semelli*. Among the molluscs, the main export was the cuttlefish *Sepia pharaonis* from the Gulf of Aden and dried sea cucumber from mainly the western part of the Gulf of Aden and the northern part of the Yemeni Red Sea waters.

2.4.6 Pollution

Sewage is considered an important environmental threat throughout the region. Most of the treatment plants in Jeddah are overloaded and, hence, the effectiveness of treatment is very low, hence, the low quality of treated effluent from the plants.

In Jordan untreated sewage was discharged directly into the Gulf of Aqaba in the vicinity of the port up until 1987, when the city started treating its waste water. The treated effluent is used for irrigation purposes in the vicinity of the treatment plant. Considerable amounts of sewage are, however, being discharged into the Gulf from cargo vessels, tour boats, ferries and private yachts. In Saudi Arabia's Red Sea coastal cities of Jeddah and Yanbu, domestic waste water treatment is considered quite adequate. The advanced Yanbu treatment plant produces waste water suitable for irrigation, and only a limited amount is discharged to the sea (UNEP 2003). One of the main sources of pollution on Egypt's Red Sea coast is the discharge of poorly treated or untreated sewage effluents into the marine environment. Tourist areas located outside city limits have their own sewage treatment facilities, many of which use compact treatment units which operate under widely fluctuating flows, the result of significant variations in hotel occupancy. Treated effluents are occasionally discharged into the sea. Damage to marine life is evident in Taba, Nuweiba and Sharm el Sheikh on the Gulf of Aqaba, and at several localities on the Egyptian Red Sea coasts. Although sewage tops the list of environmental problems in Somalia, the threat is not considered imminent. Nevertheless, because of the untreated domestic and municipal wastes dumped into the sea through the port facilities in Mogadishu and other parts of Somalia's Red Sea coast, the handling (collection, treatment and disposal) of such wastes in an environmentally sound manner is considered a priority. Urban solid waste dumps form another possible source of local pollution in Somalia. A large open tipping site is located right on the coast at Mogadishu, close to the city abattoir. In the rainy season, leachates run off directly into the sea. Solid waste is considered a particular problem in Jordan. The beaches and nearshore reef and sea grass areas of Jordan's Gulf of Aqaba are heavily polluted by discarded plastic and other refuse materials (UNEP 2003).

Coastal industries in the region include power and desalination plants, refineries, fertilizer manufacturers and chemical plants. These industries and their effluents (oil, organic pollutants, heavy metals, heated brine and cooling water) are considered

important problems in every country of the region. The principal industries of Jordan are located along the coastline of the Gulf of Aqaba (UNEP 2003). These include a 260 megawatt thermal power station, a large fertilizer manufacturing facility, cement plant, a storage area and loading terminal for potash, a tank farm for chemicals, oils and solvents, and an associated port facility. These factories discharge chlorinated cooling water into the Gulf at a rate of 20,000 cu m/h which at the discharge point is approximately 3°C above marine water temperature, with an as-yet undetermined impact on nearby corals and marine life. The resulting impact on the marine ecosystems due to thermal pollution and the elevated levels of salt and chlorine in the return waters vary with the volumes of water and the location of the discharge. Discharges into the marine environment from the Jeddah plants include chlorine and anti-sealant chemicals as well as brine, which exceeds by 1.3 times the ambient salinity of the Red Sea, at a temperature of 41°C (approximately 9°C above the average ambient Red Sea temperature) (UNEP 2003).

There are quite considerable agricultural activities in the Suez Gulf. Fertilizer and pesticide residues are discharged into the Gulf as a result of agricultural run-off. The issue of persistent organic pollutants is of particular importance because of the substantial use of pesticides, insecticides, and herbicides for agricultural purposes. As mentioned before, considerable agricultural activities have been established in the Suez Gulf (UNEP 2003). Fertilizer and pesticide residues are being discharged into the Gulf as a result of agricultural run-off. Other potential hazards include effluent from the Tokar Delta Agricultural Scheme. The Locust Control Programme of the Red Sea area in Sudan is probably the largest in Africa and the Middle East. Large quantities of insecticides are being sprayed every year along most of the coast. Sometimes untested chemicals are used without any follow-up to observe possible residues or environmental impact.

This is a serious issue that needs urgent study. The extensive use of pesticides, insecticides and herbicides for agriculture and other purposes renders this area a priority, after the sewage problem. The use of fertilizers and pesticides to increase agricultural production is widespread throughout the country. These chemicals are introduced into the marine environment by the flow of agricultural run-off and drainage and, to a lesser extent, by atmospheric depositions (UNEP 2003). Information on this source of pollution with respect to both quantity and quality, which would make it possible to evaluate the magnitude of the problem and its severity for the marine environment, is not available, however. In view of the extensive use of pesticides, insecticides and herbicides for agriculture and other purposes, this area must be considered as the fourth priority issue. Several types of chlorinated and organo-phosphorus pesticides are used extensively on farms and plantations (UNEP 2003). The agricultural drainage waters, which may be presumed to contain high concentrations of pesticides, find their way to coastal waters via both rivers and land run-off. Other types of marine pollution resulting from agricultural growth and development may also be affecting the coastal areas of Somalia. Coastal dune formation and subsequent erosion arising from overgrazing of the covering vegetation has led to increased siltation, particularly in the southern region. Further increases in the silt load could have a heavy impact on the fringing reef ecosystem, which serves as a nursery ground for Somalia's artisanal demersal fisheries. The extensive use of pesticides, insecticides and herbicides for agriculture and other purposes is another priority concern in Somalia (UNEP 2003).

2.4.7 Tourism and recreation

Drawn by the attractive marine life and the favourable climate, a major tourist industry has evolved on the coasts of the Red Sea. Tourism is an important component in Jordan's growing economy, but the physical alteration and destruction of habitats as a result of dredge and fill operations associated with urban expansion, tourist and industrial developments are main sources of environmental deterioration in this area. Currently, approximately 66% of Jordan's tourists visit Aqaba - about 600,000 tourists. In addition, uncontrolled tourist activities such as damage to corals by anchors, tourist boats, and coral breakage by divers have resulted in significant damage and destruction of key habitats of the Gulf (UNEP 2003). Large recreational cities and centres have been developed along the Jeddah coastline without any adequate evaluation of potential environmental impacts. The construction of these large projects has required significant dredge and fill operations, which adversely impact the coastal environment. In addition to the direct destruction of marine life and key habitats, the suspended fine materials resulting from these activities can result in widespread damage to marine life. Such sedimentation results in the suffocation of the benthic communities and has an adverse effect on the surrounding ecosystems (mangroves, seagrass beds and coral reefs) and, as a consequence, a decline in the productivity of the sea as measured by shrimping grounds and other demersal fisheries. The practice of extending plots onto the coast and into the sea can change the current pattern, morphology and substrate, thus affect the marine life, and usually provide new sources of continuous degradation (UNEP 2003). The coastal tourist industry in Egypt is booming, and large expanses have been developed into beach resorts. The most intensively developed areas on the Red Sea are Hurghada and Sharm el Sheikh. Significant tourist development has also taken place at Dahab, Nuweiba and Taba on the Gulf of Aqaba coast as well as at Safag and Quseir on the Red Sea coast, and the northern sector of the Gulf of Suez. It has been reported that areas such as Hurghada and Sharm el Sheikh have been developed and exploited beyond their ecological and social carrying capacities and are already showing signs of environmental degradation. Evidence of reef degradation due to tourism and other activities is clear even in areas such as the Ras Mohammad National Park in Egypt (UNEP 2003). It is estimated that the Red Sea coast and the Gulf of Aqaba will attract over one million tourists per year during the next few years. Such rapid tourism development may lead to a serious threat to both the marine environment and the tourism industry itself, if not planned and developed on a sound environmental basis with the effective enforcement of environmental regulations (UNEP 2003).

2.5 Activities

The Global Environment Facility (GEF) Council approved the Project Brief for the Strategic Action Programme (SAP) for the Red Sea and Gulf of Aden in November 1997. The SAP is comprised of the following components: Institutional Strengthening to Facilitate Regional Co-operation; Reduction of Navigation Risks and Maritime Pollution; Sustainable Use and Management of Living Marine Resources; Habitat and Biodiversity Conservation; Development of a Regional Network of Marine Protected Areas; Support for Integrated Coastal Zone Management; Public Awareness and Participation; and Monitoring and Evaluation of Programme Impacts.

2.5.1 Institutional Strengthening to Facilitate Regional Co-operation

This component is crucial for the success of the Project since it will provide administrative and technical support to the other components. The resource mobilization element included in the component will contribute to sustainability of the SAP as a whole. The component will be implemented by the PERSGA Secretariat.

For further information on activities link to:

<http://www.persga.org/about/projects/SAP/Components/1.asp>.

2.5.2 Reduction of Navigation Risks and Maritime Pollution

The Red Sea and Gulf of Aden extend over a distance of some 1700 nautical miles and are on average between 120 and 150 nautical miles wide. They form part of a major world shipping route which currently carries around 7 percent of global seaborne trade. Much of the world's crude and refined oil cargoes pass through the Red Sea and Gulf of Aden and this Region would suffer significant damage were a major oil spill to occur. The overall aim of this component of the Project is to support the objectives of the SAP by reducing the risks of maritime accidents and minimizing maritime pollution in the Region.

Activities

- Hydrographic Surveys and Navigational Aids
- Oil Spill Prevention and Management
- Traffic Separation Schemes (TSS)
- Vessel Traffic Systems (VTS)
- Oil Spill Prevention and Management

For further information on activities link to:

<http://www.persga.org/about/projects/SAP/Components/2.asp>

2.5.3 Sustainable Use and Management of Living Marine Resources

The scope of this component, which focuses on ecosystem health and biodiversity conservation, is different from previous fisheries studies in the area and the background data required are more diverse, including environmental and socio-economic information.

Activities

- Development of a Sustainable Management Strategy for Transboundary Fish Stocks and Invertebrates
- Establishing the Legal and Policy Framework for Conservation and Sustainable Management of -Living Marine Resources
- Production of the "Status of Living Marine Resources in the RSGA" report
- RECOFE
- Sharks Identification Guide

For further information on activities link to:

2.5.4 Habitat and Biodiversity Conservation

The Red Sea and Gulf of Aden contain some of the world's most important coastal and marine habitats and species communities. There is a wide variety of coral reef types in the Red Sea with a structural complexity unmatched on earth and their diversity is greater than anywhere else in the Indian Ocean. The number of species confined to the Region and found nowhere else is extremely high. The Region in general and the Gulf of Aden in particular are among the biologically least known parts of the Indo-Pacific, a major obstacle to meaningful management. Key habitats that need attention are coral reefs, seagrass beds and mangroves; taxa of concern are reef fish, sea turtles, sea birds and marine mammals.

Activities

- Development of a Regional Conservation Plan for Turtles, Seabirds and Marine Mammals
- Development of a Regional Conservation Plan for Key Habitats: Mangroves, Seagrass Beds and Coral Reefs
- Establishing the Legal and Policy Framework for Conservation of Habitats and Biodiversity

For further information on activities link to:

<http://www.persga.org/about/projects/SAP/Components/4.asp>

2.5.5 Development of Marine Protected Areas

The establishment of a system of MPAs aims at conserving all ecosystems of the Red Sea and the Gulf of Aden as a whole. The proposed network therefore contains examples of all major biogeographical sub-units of the Region and major habitat types within each sub-unit. It includes prime examples of the full range of coastal and marine habitat types and species communities.

All countries in the Region have designated MPAs, but they are few in number and only one or two are adequately managed. Many of the current and/or proposed protected areas are under high pressure from fishing and tourism; others are at risk from navigation and development activities in adjacent areas. To avoid designating more MPAs than can be managed, the proposed programme emphasises institutional and capacity building, including resource mobilisation. The programme is designed in a way that the experience gained during this regional exercise will allow each country to introduce conservation management to the full set of MPAs in its territory.

Activities

- Regional Networking
- Master Plan for MPAs
- Exchange of Information between Decision Makers and Building Commitment

For further information on activities link to:
<http://www.persga.org/about/projects/SAP/Components/5.asp>

2.5.6 Integrated Coastal Zone Management

Integrated coastal zone management in most countries in the Region is adversely affected by weak co-ordination between ministries, overlapping jurisdictions, conflicting objectives, and weak execution of land use plans. Effective implementation of ICZM plans will reduce the incidence of inappropriate development decisions and provide an effective mechanism for sustainable long-term use of the coastal zone. Throughout the Region the adoption of this planning and management process to support development decisions could significantly decrease unnecessary degradation of the coastal and marine environments. The effective use of ICZM is especially important in supporting the co-operating countries to meet challenges related to long-term development of coastal settlements and development zones, further expansion of international and domestic tourism, and maintenance of the rich biodiversity and cultural heritage of the coastal zone.

Preparation of the SAP identified the need to strengthen integration of environmental and natural resource concerns in planning and management of the coastal zone. An important activity under the component will be creation of a PERSGA co-ordinated network of regional specialists to promote ICZM and exchange experiences between co-operating countries. This will be complemented at the regional level by support for training activities focused on the use of ICZM and related tools such as environmental assessment and Geographic Information Systems (GIS) in planning and management of the coastal zone. Current use of ICZM is concentrated in the northern countries in the PERSGA Region and is mainly taking place at the national level. Under the component support will be provided for model ICZM activities in the four southern countries, to balance efforts and to demonstrate sub-national approaches to ICZM for selected priority areas. A mechanism for the promotion of ICZM in these areas will take the form of national and/or local level ICZM working groups that include a full range of stakeholders including relevant Government agencies, academic institutions, community leaders, private sector interests and non-governmental organisations (NGOs).

Activities

- Integrated Information Management System (IIMS)
- Model ICZM Activities

For further information on activities link to:
<http://www.persga.org/about/projects/SAP/Components/6.asp>.

2.5.7 Public Awareness and Participation

This component will design and incorporate public awareness and participation activities in a way to meet the requirements and recommendations of the thematic SAP components. The component will ensure the participation of NGOs (regional or national). It will also work on the production of public awareness material including PERSGA's

newsletter “Al-Sanbouk”. This component will use various media means to raise public awareness and will establish and maintain a website to ensure worldwide dissemination of SAP activities and to create global awareness of environmental issues related to the RSGA region.

For further information on activities link to:

<http://www.persga.org/about/projects/SAP/Components/7.asp>

2.5.8 Monitoring and Evaluation of Programme Impacts

The monitoring and evaluation component is a built-in programme that will essentially allow continuous and structured monitoring and evaluation of programme impacts. In this manner, the capacity of PERSGA in self-monitoring and evaluating activities will be enhanced substantially. Results from this component will serve as an early warning system regarding programme progress and will be of great importance in recommending corrective measures/steps if problems arise. It will also enable the Project to fulfil the reporting requirements of the GEF implementing agencies.

For further information on activities link to:

<http://www.persga.org/about/projects/SAP/Components/8.asp>

3 Publications

3.1 Regional Seas Reports and Studies

Link to Regional Seas Reports and Studies:

http://www.earthprint.com/show.htm??url=http://www.earthprint.com/cgi-bin/ncommerce3/CategoryDisplay?cgfrnbr=21240&cgmenbr=27973&CGRY_NUM=&next=1

3.2 Technical Reports

For a full list of Technical Reports link to:

<http://www.persga.org/Publications/Technical/Technical.asp>

3.3 Other Publications

For a full list of publications link to:

<http://www.persga.org/Publications/General/General.asp>

Also for Outreach material link to:

<http://www.persga.org/Publications/OutReach/OutReach.asp>.

3.4 Meeting Reports

[blank]

3.5 Website Links

PERSGA www.persga.org.

CEDARE <http://www.cedare.org.eg/about/about.htm>

3.6 Newsletter

Al-Sanbouk Link to: <http://www.persga.org/Publications/Alsanbouk/Alsanbouk.asp>.

4 Calendar of Events

October 2003

PERSGA Council Meeting

International sea to Sea forum

Expected issue of the forum is "ICZM" during the forth quarter of 2004

Meeting of the Governor of the Coastal Cities in the Red Sea and Gulf of Aden during the Second quarter of 2004

Meeting of Heads of National Oceanographic institutes in PERSGA member states during the last quarter of 2004

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5.2 List of Institutions

[to come]

6 Advertisements

A draft Protocol Concerning the Conservation of Biological Diversity and the Establishment of Protected Areas and a draft Protocol on the Protection of the Marine Environment from Land-based Sources of Pollution in the Red Sea and Gulf of Aden have been sent to member states for review.

7 References

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