

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

PERSGA

**Status of the Living Marine Resources in the Red Sea and Gulf of Aden
and Their Management**

(SUMMERY)

By

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The Red Sea has a number of unique marine habitats, including sea grass beds, salt pans, mangroves, coral reefs and saltmarshes. The Gulf of Aden is a region of oceanic upwelling, resulting in high productivity of fish resources, particularly in the eastern part of the Gulf of Aden. The Socotra Archipelago constitutes a separate ecosystem; the importance of its unique environment and endemic biodiversity is on a par with the Galapagos Islands. The fisheries of the Red Sea and Gulf of Aden are of considerable socio-economic importance to the member states of the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA), in terms of national food security and income generation for rural communities. Fisheries resources are exploited by artisanal subsistence fishermen, local commercial fisheries and for industrial fisheries targeting invertebrates, demersal finfish and pelagic finfish. Many species cross national boundaries and are essentially shared stocks. The Red Sea artisanal sector comprises at least 29,500 fishermen and 9,000 vessels. The Gulf of Aden artisanal sector comprises at least 28,000 fishermen and 6,400 vessels. Artisanal fishermen use a range of gears, including long-lines, hand lines, gill nets, trawls, trammel nets, tangle nets, set nets, traps and spears. The Red Sea industrial sector totals at least 7,500 fishermen and 1,600 industrial vessels. The Gulf of Aden industrial sector comprises at least 450 fishermen and 65 vessels. Industrial vessels utilize purse seine, trawl, long-line and vertical drop-line gear. The artisanal and industrial fisheries in the Red Sea and Gulf of Aden produced around 17,096 metric tons of invertebrate species and 194,844 metric tons of finfishes in 1998. These figures indicate a considerable increase in the Region's production of 7,951 metric tons and 135,904, respectively, in 1988. In 1998 Yemen accounted for 56 percent of total production of invertebrates, Saudi Arabia 32 percent and Egypt and Somalia around 5 percent each. Sudan, Eritrea and Djibouti together accounted for less than 2 percent. Important commercial invertebrate species include penaeid shrimps in the Red Sea and cuttlefish and rock lobsters in the Gulf of Aden. In 1998 Yemen accounted for 52 percent of total finfish production, Egypt 26 percent and Saudi Arabia 11 percent. Jordan, Sudan, Eritrea, Djibouti and Somalia together accounted for around 11 percent of the Regional total. Pelagic finfish catches are dominated by sardine, Indian mackerel, Spanish mackerel and yellow fin tuna. The demersal catch is dominated by species

of snapper, jack, emperor, lizardfish, grouper, seer fish, rabbit fish and sea bream. Artisanal fisheries under-exploited in Djibouti, Sudan and Somalia. Declines in catches are reported for several fisheries such as Indian mackerel, kingfish, shark, cuttlefish, shrimp, rocklobster and trochus. Fish collecting for the aquarium trade is significant in Saudi Arabia and Yemen. Saudi Arabia has at least seven aquarium fish exporters in operation. Marine aquaculture in the Region includes shrimp farming in Egypt and Saudi Arabia and pearl oyster farming in Sudan. Turtles are caught by fishermen throughout the southern Red Sea and Gulf of Aden. Turtle meat and eggs are eaten and oil collected along the coasts of Sudan, Djibouti, Yemen and the Socotra Archipelago, and Somalia. Local recreational use of beaches results in nesting turtles being disturbed or killed at Dhobba, Shihr and Ras Sharma in Yemen. The shark resources of the Region are heavily fished, especially in Sudan, Djibouti, Yemen and the Socotra Archipelago, and Somalia, where there is evidence of depletion. This is attributed to a lack of control over national shark fisheries and also an increase in illegal fishing by fishermen working outside their normal territorial boundaries for the Southeast Asian shark-fin market. Sharks are caught with gill nets and long-line which also damage reefs. Carcasses are habitually discarded once the fins are removed. The shark-net fishery and shrimp trawl fisheries have very high by catch rates of fish, turtles and dolphins, which are discarded. The efficiency of fisheries data collection, analysis and dissemination systems varies throughout the Region. Egypt, Djibouti and Saudi Arabia have systems in place to monitor catch by species at major landing sites.

In Sudan and Jordan data collection is ad hoc, and in Somalia very little reliable information is available. Data for the industrial fleets is generally of better quality than artisanal fleets, but the greater socio-economic importance of artisanal fisheries underlines the fact that improved monitoring of artisanal activities is urgently required. Current data collection systems are designed to record catch at landing sites for the production of annual catch summaries. Biological information is not generally recorded. Fish processing information is also unrecorded. National authorities do not have access to data of sufficient quality to allow stock assessment or economic evaluation of fisheries activities. The Egyptian and

Yemeni fishing fleets have modernized and expanded in the past 10 years, but there is not enough information with which to examine sustainability of current effort. Applied fisheries research and stock assessment throughout the Region has been neglected in the past two decades. In most countries, no stock assessment has been undertaken since the cessation of collaborative research programmes undertaken during the 1970s and 1980s by the former Soviet Union and international organizations such as the Food and Agriculture Organization of the United Nations (FAO). Only Djibouti undertook significant assessment of demersal and pelagic stocks in the 1990s, with German assistance. Consequently most national authorities do not have reliable recent resource information regarding stock status, population parameters, estimates of potential biological yield or comprehensive and reliable catch and effort statistics even for the commercially important stocks. Such information is required on which to base rational management plans, monitor the effectiveness of management strategies and assess the socio-economic value of the fisheries. The absence of effective control, surveillance and enforcement of regulations has resulted in widespread poaching and habitat destruction by foreign and national vessels, especially off the Gulf of Aden coast of Yemen and Somalia. Illegal fishing by vessels operating outside their national waters is commonplace. Lack of management has resulted in concerns of overfishing on some stocks. The northern Red Sea coast, from al-Lath to the Jordanian border on the Saudi Arabia side and the areas in and around the Gulf of Suez appear to be fully exploited. Concentration of Jordanian fishing effort within the limited national waters in the upper Gulf of Aqaba has reportedly led to a reduction in the number and diversity of fish caught. Over-exploitation in localized areas of Djibouti (Doralé, Khor-Ambado, Arta Plage, the islands of Musha, Maskali, Waramous) by sport and artisanal fishing is further compounded by habitat destruction. Catches and average size of rock lobster and cuttlefish off Yemen's southern coast have declined in recent years possibly indicating growth overfishing and recruitment over- Living Marine Resources xiii fishing.1 Uncontrolled expansion of industrial trawling has led to a decline in shrimp catches in the Red Sea. The large number of licenses issued to foreign industrial trawlers to fish in Yemeni waters has caused major habitat destruction, including damage to coral reefs, sea grass beds, spawning grounds for cuttlefish and

depletion of resources. These vessels compete with artisanal fishermen whose gear they regularly damage, and conflicts are common. The legal framework providing for fisheries management and development is weak in many states. Penalties for infringements are too low to act as an effective deterrent and encourage compliance by fishermen. Enforcement is virtually non-existent in most of the Region. Internationally accepted models for management have not been adopted, such as the principles laid down in the FAO Code of Conduct for Responsible Fisheries. However, some states are acting to strengthen the national legal framework through higher penalties, provisions for habitat/biodiversity conservation and clearly defined powers for management authorities and enforcement officers. National institutional structures lack the administrative and technical capacity to formulate and implement realistic and effective fisheries management policies and strategies. A generic problem throughout the Region is the lack of financial and material resources allocated to those authorities responsible for fisheries research, management and development. Weak systems for integrated planning and management have allowed rapid growth of unplanned settlements and increased pressure on coastal resources. Integrated management and coordination between ministries does not exist in most countries because of the strong sectorial nature of government. Institutional capacity needs to be strengthened in the areas of regulatory policy, fisheries management and environmental conservation. At the regional level greater cooperation between states in data sharing, research and management issues lead to improved and costeffective monitoring, control and surveillance (MCS). Indeed, research and management of transboundary stocks requires a regional approach. Greater harmonization of national legislative frameworks for fisheries and the environment, data collection, research and MCS operations and procedures would provide a better basis for costeffective management. A lack of awareness of the need for and benefits of effective fisheries management by stakeholders in the fisheries sector is a critical problem throughout the Region. Insufficient resources are allocated to human resource development in both the public and private sectors throughout the Region. Greater training opportunities for fisheries managers, fisheries scientists, and MCS personnel, personnel for maintaining shore facilities, extension services, cooperative staff and fishermen

are required. Access to affordable terms of credit is a major constraint for fishermen wishing to maintain their operations or equip themselves for entering new, less exploited fisheries. An exception is Yemen where the Cooperative Agricultural Credit Bank (CACB) operates a highly effective soft loan arrangement for fishermen. In the absence of other more amenable forms of credit, many vessels owners in Egypt and Sudan depend on fish merchants for loans to finance operations, gear, maintenance etc., often at high rates of interest. These loans are provided on the basis that the fishermen then sell their catch to the particular merchant. This 'informal credit system' often leaves the fisherman at a disadvantage with regard to pricing structure. Shore based facilities in the Region are relatively well developed in Egypt, Saudi Arabia and along Yemen's Gulf of Aden coast. Most artisanal catches are marketed fresh, chilled on ice. However a lack of ice machines, cold storage, fish processing and marketing infrastructure in many rural areas in Sudan, Somalia and Yemen's Red Sea coast limits the expansion of artisanal catches and often results in poor quality and, consequently, reduced earning potential for rural fishermen. Large stretches of Sudan's coastline are without even basic facilities. The lack of infrastructure, 1. Growth overfishing: a level of fishing in which young recruits entering the fishery are caught before they grow to an optimum marketable size; a level of fishing beyond that required to maximize yield (or value) per recruit. Recruitment overfishing: A level of fishing in which the adult stock is reduced to the extent that recruits produced are insufficient to maintain the population. Strategic Action Programme for the Red Sea and Gulf of Aden especially ice and road communications in Sudan has led to increased pressure on resources such as trochus, pearl shell and bêche-de-mer. Most of Somalia's shore facilities were destroyed during the civil war in the 1990s. Consequently fishing pressure on sharks has increased for the production of sun-dried meat and fins. Exports of fish products from the Region are small; only Yemen is a significant exporter. Saudi Arabia and Egypt are net importers of fish products. Although investment in shore infrastructure on Yemen's Gulf of Aden coastline has enabled a wide range of fisheries products to be exported, Yemen is currently suffering from the loss of its European market as a result of failure to comply with European fish quality and hygiene standards. Threats to the Region's coastal and marine habitats are posed by a number of

factors. These include habitat destruction due to coastal development, pond construction for shrimp and fish culture, mangrove destruction, damage to coral reefs through unsustainable fishing practices, removal of coral for the tourist trade, and physical damage caused by tourist divers. Overfishing, illegal fishing and non-compliance with national fisheries laws and regulations pose a significant threat to the longer-term sustainability of living marine resources. The Region is a major oil producer and transportation route for crude oil. The risk of oil tankers running aground and discharges from vessels, as well as continued oil exploration and oil terminal construction, pose significant threats to fisheries and coastal resources. Industrial activities and urban development pose threats in the form of industrial and urban pollution, waste disposal, surface and groundwater usage and saltwater intrusion to aquifers. Agricultural threats include increased sedimentation and run-off of pesticide and fertilizer residues. The Region requires assistance to address these problems. The emphasis for future assistance should be on greater management and control rather than stimulation of fishing activities. This will require training, equipment and finance for improved fisheries and environmental MCS. Improved infrastructure, especially in the form of cold storage and handling facilities, coupled with more assistance in improving quality control would result in greater utilization of fisheries resources and increased revenues from domestic and export markets.