

THE CORAL REEFS OF EGYPT

By

Tamer Monir Attalla (Ph.D)

Red Sea Protectorates – Natural Conservation Sector- Ministry of Environment

1- Overall Status of Coral Reefs in Egypt

The diverse coral reef ecosystems of the Egyptian Red Sea have evolved from the area's unique geological and bio-geographic features. In the north, the Red Sea rift system splits into the Gulfs of Suez and Aqaba which both have markedly different morphologies (Figure 1). The Gulf of Suez is a spreading rift but remains shallow, with an average depth of 30 m. The reefs of the Gulf of Suez are discontinuous fringing reefs along the western side, whereas the eastern side has much smaller broken up fringing and patch reefs. The Gulf of Aqaba is quite different as it is characterized by narrow fringing reefs and vertical drop offs due to its formation by a strike-slip rift system as the Arabian Peninsula has moved both in parallel and apart from Sinai. The Gulf is very deep, reaching a depth of 2000 m.



Figure-1: Egyptian coast of the Red Sea and location of the main cities

Inside and south of the Gulfs of Suez and Aqaba are extensive fringing reefs. Fringing reefs have formed on the Egyptian Red Sea coast as well as along the Gulf of Suez and Gulf of Aqaba, which extend from Gubal in the north to Ras Hedarba, at the border of Sudan. This fringing reef is not continuous because periodic flooding from wadis creates gaps in the reef,

resulting in soft bottom sharms or lagoons. Seaward extensions and the complexity of coastal fringing reefs are directly related to the nature and profile of underlying substratum as well as the force of periodical floods. Several submerged offshore reefs in addition to the fringing reefs that encircle more than 46 offshore islands are also found, forming rich coral reefs communities and precious natural resources in the region. The width of the fringing reefs range between 25-150m in the northern Red Sea, but may exceed 0.5 km offshore at reefs between Marsa Alam and Shalatein. The reef flats of the fringing reefs comprise some 1760 km² of the Egyptian Red Sea coastline with an average width of 250m. Seaward reef walls or faces have an average depth of 30m, which equates to a total area 492 km² of fringing reef in the Egyptian Red Sea. Patchy form reefs around the islands total 156 km² giving a total reef area of 733 km².

The monitoring of coral Reef in Egypt Started from 1998 in some site along the Coast of Aqaba Gulf and from 2000 until now at some sites inside and outside the Red Sea Protectorates. The distribution of coral reefs along the Egyptian coast also shows north-south variations in diversity and community structure. The average living coral cover on the Red Sea coast is about 50% in the non-sheltered area, while in sheltered area this average increase to about 80% of the reef area.

Coral reef fishes assemblages of the Red Sea are as varied as the reefs themselves. There are marked differences among areas in species richness, assemblage's composition and abundance of species. Information regarding the fish communities of the Red Sea is also limited. About 1400 species of fishes are known to occur in the Red Sea. The total number of reef fish found in the Egyptian Red Sea is 325 of which 17% are endemic species to the Red sea.

2- Threats

Corals reefs in Red Sea, like much of the rest of the world's reefs, are being degraded by a host of human and natural factors. Wind driven, waves, tropical storms, tides, temperature and salinity and outbreaks of COTs are consider as the natural impacts on the coral reefs in Red Sea, but the greatest threats generated by human activities are indicated to be pollution, sedimentation, unsustainable fishing activities, physical damage due to diving pressure, ship grounding and anchoring, sewage and wastewater disposal, increasing of costal developments.

2.1. Human Impacts:

2.1.1 Tourism industry impact on coral reefs

Tourism is currently the greatest threat to corals reefs in Egypt, yet is an extremely important economic activity. A recent survey established that 61% of the coral reefs of Egypt were seriously at risk from human impacts

2.1.2. Direct impact of recreational activities:

Damage by diving and recreational activities is due to combination of several factors: involvement of training of new uncertified divers and introductory courses, poor buoyancy control of divers. Divers encompass a small area so that number of divers per unit area within the site is high and corals at these sites are thus more susceptible to damage. Observations of the divers showed high frequencies of behaviors that potentially damage the coral reef in use. Divers were observed to contact the reef voluntarily and involuntarily with their hands, fins, and equipment. Some were observed breaking corals. Others, particularly divers under training, had contact with the sea bed raising sediment clouds that were observed actually dispersing and settling on nearby colonies.

2.1.3. Unplanned land use and intensive development:

Before declaration of Law 4 of Environment in 1994, filling of reef flats with sediment and shore dredging occurred extensively along the Egyptian coast of the Red Sea. Not only do these activities directly destroy the reef framework but the sediment in plumes can smother adjacent coral reefs, prevent new coral settlement by covering hard substratum with sediment and reduce light levels needed for coral survival. But after implementation of Law 4 of Environment in 1994 by Law 9 of Environment in 2009 which prohibits any activities that could change the nature of the shoreline even with the increase in number of hotels.

2.1.4. Damage from recreational boat anchors and grounding:

Over the last two decades, the number of tourism boats has increased sharply leading to increased damage to coral reefs from anchoring and boat groundings.

2.1.5. Dredging for Walk way and Marina:

Beaches are prime features for resort developers, but because they are scarce many coastal resorts located on rocky shores have created artificial walk way to reach the deep water for swimming and diving activities. In addition, building big marinas to occupied the large numbers of tourism boats and also to provide lots of facilities to surf this number of

boats such as gas and water supply. This activity destroys large areas of back reefs which by the way cause habitat loss and also slaughter in some beaches and deposition in others.

2.1.6. Fisheries impact:

Overfishing: It poses a threat to the coral reefs of Egypt as there has been an increase in reports of commercial fishing activity and also heavy trawling activities in the Gulf of Aqaba and poaching of fish in no-take zones.

Destructive fishing: There are reports of some unsustainable illegal fishing practices operating along the Egyptian Red Sea coastline including spear fishing, the use of closed mesh nets and sometimes dynamite or blast fishing. These practices remove key species in the food chain and also seriously damage coral reef habitats.

Shark and sea cucumber fishery: More recently shark and sea cucumber fishing have appeared as major additional threats to Egyptian reefs.

2.1.7. Oil Pollution:

Pollution from oil exploitation and industrial activities is another threat that comes from both exploitation and transportation of millions of tons of oil passing through the Red Sea.

2.2. Natural Impacts

2.2.1 Flooding

In Egypt, infrequent heavy rainfall causes flash floods from wadis, which temporarily increases sediment loads and reduce salinity levels in the area covered by the discharge plume

2.2.2. Damage of coral reefs due to Crown-of- thorns (COTs) outbreak and recovery:

Several series of COTs outbreaks have been reported in the Ras Mohammed National Park (Gulf of Aqaba) and Red Sea Protectorates, throughout 1998 to 2002.

2.2.3 Climate change:

Until recently, there was little evidence of impact on coral reefs of the Egyptian coast of the Red Sea due to the climate change.

3. Coral reefs conservation effort

3.1 Interventions

Policy makers in Egypt understand the need to protect environment in general and The Red Sea coral reefs, in particular, in order to sustain tourism in the future and are now making

concerted efforts to minimize the impacts of the threats mentioned above. Since 1936, Egypt always participates as party in the main international and regional conventions and agreements. Other numerous local ministerial decrees related to conservation of the coral reefs are established and implemented including: introduce closed fishing seasons during spawning periods of reef fishes, prohibit fishing or trading on ornamental coral reef fishes and sea cucumber, and curio trade in general, forbidding fishing of sharks, strengthen law enforcement, control oil pollution and solid waste, prohibit using anchors on coral reefs, ...etc.

3.2. Declaration of Marine Protected Areas (MPAs)

Policy makers in Egypt understand that the best approach to protect marine resources especially coral reefs in areas characterize with booming in tourism development, such as the Egyptian coast of the Red Sea, is declaring Marine Protected Areas (MPAs) along the Egyptian coast of the Red Sea. By 2020 20% of Egypt declared as protected areas (Figure 2). More than 80% of the coral reefs on the Egyptian coast are declared as MPAs. Based on the major sensitive habitats especially coral reefs, Egypt declared 6 MPAs since 1983. They include interconnected marine and terrestrial sectors based on conserving coral reefs and accompanying systems, marine ecosystem, mangrove bushes, marine islands and adjacent mountain and desert areas. They also serve as attractions for tourist seeking scuba diving and water sports in Egypt. These protected areas include: Ras Mohammed Protected area, Nabq, and Abu-Galum in South Sinai Governorate Gulf of Aqaba), and Elba, (the Red Sea islands), Wadi El Gemal and more recently Northern Islands Protected area in the Red Sea Governorate (Red Sea).

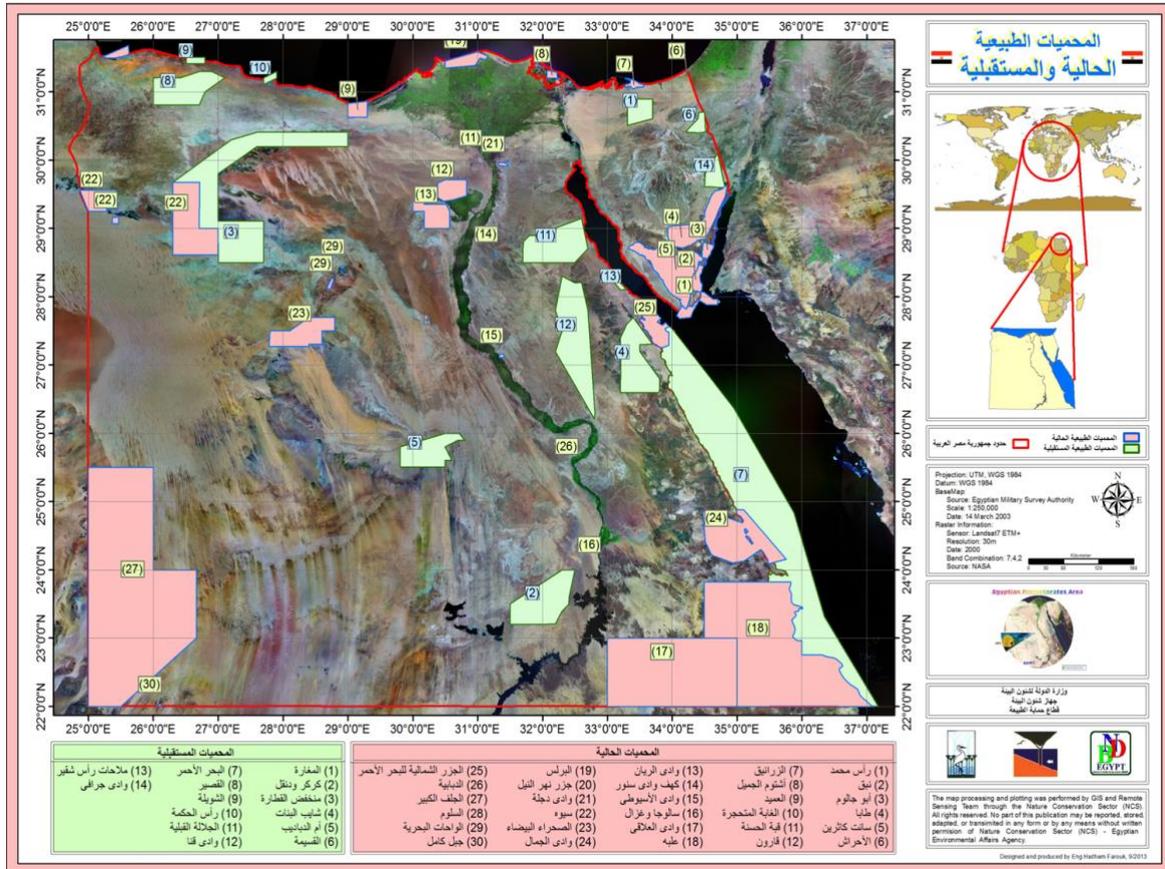


Figure (30) Map of Existing and future protected Areas in Egypt

3.3. Mooring installation program

The installation of mooring buoys, the management of the number of diving vessels using mooring buoys with respect to the number of dives per year is effective tools in reducing physical damage to coral reefs. In early 1997, the Hurghada Environmental Protection and Conservation Association (HEPCA) with financial assistance from the United States Agency for International Development (USAID) installed over 250 mooring buoys (including reef top pins) at popular local diving sites within the Red Sea Protectorate. This program has expanded in geographical scope over the years (over 1000 mooring buoys installed) and is now also supported by the Egyptian Environmental Affairs Authority (EEAA).

3.4. Awareness raising

Environmental awareness has increased in Egypt, due to activities of the EEAA, More and more, hotel owners and others involved in the tourist industry are aware of the fact that corals need to be treated with care and that failing to do so could undermine the very resource that most of the tourist industry is based on. Many workshops and conference done by Red Sea Protectorates to raising the public awareness to all the governmental agencies, diving centers and hotels.

3.5. Prevent of using the plastic bags in Egyptian Red Sea

Red Sea Governor announced banning the use of single-use plastic starting June 1st 2019, due to its serious environmental damages. the use of disposable plastic causes the death of hundreds of thousands of living creatures in the world.