

COASTAL AND MARINE ENVIRONMENTS IN BAHRAIN: ANTHROPOGENIC IMPACTS AND CONSERVATION MEASURES

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The Arabian Gulf is a semi-enclosed sea situated in the subtropical zone and characterized by low precipitation and high aridity. Biota in the Arabian Gulf inhabits one of the harshest marine environments due to marked fluctuations in sea temperatures and high salinities. Additional anthropogenic effects could arguably be critical for biodiversity and abundance of marine organisms inhabiting the naturally stressed environment of the Arabian Gulf, which is considered among the highest anthropogenically impacted regions in the world. Coastal development associated with intensive dredging and reclamation is increasingly contributing to the degradation of marine ecosystems. Pollutants inputs affecting coastal and marine environments of the Arabian Gulf include domestic sewage, brine waste waters, and effluents from petroleum and petrochemical industries.

This paper identifies valued ecosystem components (VECs) and their ecological goods and services in Bahrain, characterizes existing anthropogenic impacts influencing coastal and marine environments, and proposes measures that may contribute to the conservation of coastal and marine habitats in Bahrain.

Despite the limited land area of Bahrain, waters surrounding its islands support several VECs such as seagrass beds, coral reefs, mangrove swamps, and mud flats that provide important ecological goods and services. Seagrass beds are highly productive ecosystems that characterized by important ecological and economic functions. They provide food sources and nursery grounds for turtles, dugongs, shrimps and a variety of economically important marine organisms. Coral reefs are characterized by both biological diversity and high levels of productivity. They provide a variety of ecological services such as renewable sources of seafood, maintenance of genetic, biological and habitat diversity, recreational values, and economical benefits such as utilizing destructive reefs for creating land. Mangrove swamps are ecologically important coastal ecosystems that provide food, shelter and nursery areas for a variety of terrestrial and marine fauna.

However, these ecosystems are intensively subjected to human disturbance either by direct physical damage or by deterioration of the water quality resulting from increasing levels of pollution. The main anthropogenic impacts in Bahrain are reclamation and dredging, industrial and sewage effluents, hypersaline water discharge from desalination plants, and oil pollution.

Preserving and conserving genetic, species, habitat biodiversity in the marine environments are immediate priorities. Several measures could be applied to protect the biodiversity in Bahrain. Marine protected areas are widely recognized as an effective mean of protecting biodiversity. Several coastal and marine protected areas have been established in Bahrain. However, their effectiveness is restricted due to the lack of management plans.

Further integration of biodiversity into environmental impact assessment system in Bahrain is needed. This is of crucial importance as coastal and marine environments are the prime target for most developmental projects in Bahrain. Considering effects of dredging and reclamation on marine biodiversity in EIA studies and suggesting measures to avoid or reduce adverse impacts could contribute to conserve the sensitive and productive habitats in Bahrain.

Legal instruments and higher level environmental policies in Bahrain are contributing to preventing environmental degradation and conserving biodiversity. Incorporating biodiversity assessment into the legal system and implementing the Bahraini National

Biodiversity Strategy and Action Plan may contribute significantly into the enforcement of biodiversity conservation.

Monitoring and scientific research are integral part of any effort to reduce the loss of biodiversity. Developing necessary plans and mechanisms for population and habitat conservation require adequate knowledge and description of species. This could be achieved by promoting taxonomic research in the Arabian Gulf.

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