

Ocean Sustainability- Artificial Coral Reefs in Oman

Oman's strategic location allows it to have one of the most beautiful coastlines in the world. With a coastline spanning across 2092 kilometers and bordering three environmentally distinct water bodies including the Arabian Gulf, the Gulf of Oman and the Arabian Sea, it has around 530 square kilometers of coral reefs, supporting over 100 species of coral reefs and 579 species of reef fish.

The studies related to coral reefs began in the 1980s due to the threatening effects of the Crown of Thorns starfish predation. Coral growth is seen in four major areas in the Sultanate according to the National Report On the State of the Marine Environment (2003). They can be found in the Musandam Peninsula; along the rocky shores, bays and islands in and adjacent the Muscat area; the straits, shallows and shores of west Masirah Island and some sheltered locations in Dhofar and the Al Hallaniyats. The Oman Cabbage Coral found in the south of Barr Al Hikman are considered to be unique as they form the largest continuous reefs in Oman, around thirty square kilometers in extent.



These reefs need certain conditions to thrive and are therefore scattered in other areas surrounding Oman due to absence of suitable substrate, seasonal upwellings of cold water, lack of flat surfaces for growth and irregular turbidity in the region.

Various effects threaten the coral reefs in Oman. Predation by the Crown of Thorns starfish particularly in the Damaniyat Islands, parrotfish predation, boring mussels, coral bleaching due to the elevated seawater temperatures, cancerous growth and diseases on corals and harmful fishing practices endanger the coral reefs in these areas. Steps to control the population of the starfish by the Ministry of Regional Municipalities, Environment and Water Resources began in 1999. The Damaniyat Islands are also Oman's only protected area due to the abundance of marine life and is classified as a natural reserve.

With the International Year of the Reef in 1997, the MRMEWR along with the Petroleum Development Oman began an artificial reef project in Mina Al Fahal with an aim to introduce artificial reef materials and structures in the seas to create breeding grounds for fish and reduce fishing pressure on natural reefs. Three modules were developed—two of scrap tyres and one of reinforced concrete pipe. A pipe module made of reinforced concrete pipe with scrap tyres was deployed and positive results were seen in seven months with a hard reef-building coral detected growing on the module. Due to the toxicity of the material in the tyres, they were not considered

for long term reef restoration. Various reef and underwater cleanups were also organized by the divers from MRMEWR and the diving clubs across the Sultanate during this period.

Divers from Ras Al-Hamra Aqua Club in 1997 noticed the pressure on the marine environment caused due to the anchoring of boats for recreational activities and went on to install permanent mooring bouys at several popular diving and snorkeling locations.



In 1998, with the help of the PDO and the Sultan Qaboos University, they gathered information from the Reefball Development Group in Florida to build artificial coral reefs in Fahal Island using large, perforated spherical shells made of chemically adjusted concrete known as “reefballs”, to rehabilitate the coral reefs. These shells weigh around 1.2 tonnes and over time becomes pH-neutral to allow coral growth on them. They also have a life expectancy of 500 years provided they adjust well with the Omani marine environment. Their initiative entitled ‘Pro-Creator’, short for Project Reef Creator allowed up to 2.5cm/month of rapid horizontal growth on the deployed reef balls which were confirmed during monitoring. Around 40 reef balls have been deployed to act as substrate for the marine growth till 1999.



Reef Check
OMAN

Moving to 2009, Biosphere Expeditions ran research and conservation expeditions in the Musandam Peninsula. They included a placement program to train Omanis in Reef Check techniques to become Reef Check EcoDivers and Reef Check Trainers. Reef Check Oman was then established in 2017 as a non-profit aimed at preserving the coral reefs in the Sultanate.

The Law of Live Aquatic Wealth (Royal Decree no.20/2019), was issued to protect, develop and monitor the living aquatic resources in the Sultanate. Keeping the value of the marine environment and its resources in mind, Oman also established a National Strategy for Fisheries 2040 to maintain the local marine resources.

A Mouj Muscat working with the Ministry of Agriculture and Fisheries, co-created a 40,000 square kilometers area of artificial reef to promote the growth of coral reefs in the year 2014. This project was built by world leading sustainable marine farm designers, Hae Joo using sixty 'Arab Marine Pyramids' along the Al Mouj Marina which according to reports is home to 25 species of reef fish.

In 2018, an agreement was signed with a Korean firm Hae Joo to create a breeding ground for coral reefs in the form of an underwater artificial reef farm, the largest of its kind in the Gulf, to be located in Wilayat Al Suwaiq. The Suwaiq Marine Farm Artificial Reef Complex project was valued at RO 2.65 million and would be beneficial to the local fishermen as well as promote eco-tourism and is expected to be completed this year.

The Ministry of Agriculture, Fisheries and Water Resources won the top prize at the Arab Scientific Society Organization Award ceremony held at Doha for the best project in the Arab world in the field of environment in 2020. They won amongst a total of 90 projects submitted from 13 Arab countries.

This year an agreement was signed to implement the second phase of an industrial coral reef project in the wilayat of Sur to increase the fish stock in the Sultanate.

With the help of the various policies by the government as well as the initiatives by individuals in Oman, the Ministry of Agriculture, Fisheries and Water Resources have implemented large scale artificial reef projects in 14 wilayats, with a total of 13,906 artificial reefs between the years 2003 and 2019. This has reinforced their commitment towards the UN Sustainable Development Goals, in particular SDG 14-Life under water.

References:

1. https://www.researchgate.net/publication/263735438_Status_Of_the_Marine_Environment_Report_SOMER_-_Sultanate_of_Oman_Country_Report_to_UNEP_Regional_Seas_Programme_ROME_Sea_Area_RSA
2. <http://www.eso.org.om/index/list.php?categoryId=303>
3. <http://www.artificialreefs.org/Articles/al-Fahal/al-Fahal.htm>
4. <http://www.reefball.org/album/oman/procreatorproject/monitoring/6years/>
5. <https://www.artificialreefs.org/Articles/PDO/pdo.htm>
6. <https://www.omanobserver.om/love-coral-reefs/>
7. <https://www.reefcheckoman.org/about.html>
8. <https://omanuna.oman.om/en/sustainability/sdg15-life-on-land>
9. https://www.researchgate.net/publication/284123597_Oman%27s_coral_reefs_A_unique_ecosystem_challenged_by_natural_and_man-related_stresses_and_in_need_of_conservation

10. <https://www.omanobserver.om/artificial-reef-transforms-marine-life-in-muscat/>
11. <https://www.omanobserver.om/artificial-coral-reef-to-boost-fish-output/>
12. <https://muscatdaily.com/Oman/389210/Artificial-reefs-project-wins-top-Arab-prize-for--environment>
13. <https://muscatdaily.com/Oman/390142/'Artificial-reef-farms-in-Oman-enhancing-ocean-sustainability'->
14. <https://muscatdaily.com/Oman/389474/Artificial-reefs-to-help-marine-life-flourish-in-Sur>