

Impacts Of Artificial Islands Construction On The Environment

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Artificial Islands and the Environmental Health of Marine Systems

The paper discusses the construction of artificial islands and their impact on the environment, threatening the health of the seas. An artificial island is a stationary hydraulic structure on an open water area (seas, lakes, rivers), built from bottom and coastal soils, natural and artificial ice, fragments of rocks, stone, etc., in a specific geographical location for a long-term and unlimited period or a specific period, and even based on different functions.

Man, not nature, creates artificial islands; artificial islands do not have the status of islands and do not have a territorial sea, an exclusive economic zone or a continental shelf. Based on the UN Convention on the Law of the Sea, the coastal state has exclusive jurisdiction over artificial islands, installations and structures in free waters and within its territorial space. Based on Article 60 of the Convention, if the construction of artificial islands is to be accompanied by changes in the environment, the rights of coastal countries on the continental shelf should not be infringed.

Over the past 40 years, many countries, particularly those that are experiencing a shortage of land for construction, have paid much attention to these marine projects. The first floating city was on display in 1975 in the Japanese city of Osaka. This project, which was named Aquapolis, consisted of four giant floating bases of stainless steel, an area of about one hectare and a height of thousands of meters. We see such artificial islands in Austria (Danube Island), Canada (Notre Dame Island in Montreal), Denmark (Peberholm Island), Hong Kong, and in recent years – in the countries of the Persian Gulf zone. Such buildings in many countries are used to develop infrastructure (airports, ports, highways), as well as to restore their native regions and create new tourist and living quarters. However, according to ecologists, the construction of such islands causes very serious damage to the marine ecosystem, a vivid example of which can be observed in connection with the artificial islands of the Persian Gulf.

The Persian Gulf and Its Ecological Vulnerability

The Persian Gulf refers to the seas on the hydrological, hydrochemical, and other parameters. The area of the bay is 239,000 km², it is connected by the Strait of Hormuz to the Indian Ocean, is located in a dry and hot zone. The water temperature in the south of the Persian Gulf in the summer

sometimes reaches 37 degrees Celsius. With increasing thermal irradiation, the rate of evaporation increases significantly and reaches 140 million litres per year. Despite the environmental and climatic difficulties, this region has a wide biological diversity. The Persian Gulf has more than 600 species living in the water, including 500 species of fish, 15 species of shrimp and five rare species of water turtle, as well as coral reefs, algae, thickets of hara and mangroves.

It is this diversity that turns the Persian Gulf into one of the rarest habitats of living things in the world. The Persian Gulf also has rich oil and gas resources, and therefore, the passage of 25,000 giant tankers a year causes serious damage to its environment. (Erftemeijer et al., 2012) In recent years, concerns over the ecological situation of the Persian Gulf have doubled due to the construction of artificial islands by some countries in this semi-open water area. The construction of artificial islands for entertainment and housing increases pressure on the ecosystem of this sea and puts its environment on the brink of disaster. Each project of artificial islands in the Persian Gulf may entail serious environmental consequences, but among them, the construction of artificial islands on the shores of the UAE, taking into account the massive volume of executive projects, has had the greatest environmental consequences.

Large-Scale Island Construction and Coastal Transformation

Serious work on the construction of artificial islands in the Persian Gulf began in 2001. The UAE government planned the construction of 325 artificial islands in the waters of the Persian Gulf. However, the depth of the tragedy became known after the construction of the first island. According to the performers, more than 1.5 billion square meters of sand and 87 billion tons of stones were mixed for this project, and one billion tons of stones were brought to the site to complete the project. According to experts, the construction of artificial islands in the first stages led to the destruction of coral reefs and coastal nests of aquatic turtles and the silting of clear waters of the bay. Since corals can filter seawater, when large coral banks disappear, the process of water filtration decreases, and the period of conservation of increased contamination in the waters of the Persian Gulf increases.

The average depth of the Persian Gulf is 35 meters, and the period of conservation of water is 3-5 years. The creation of artificial islands increases the period of conservation of pollution in the waters of the Gulf.

Iran has the longest coastal line in the Persian Gulf (about 1,280 kilometres) but has not yet built a single artificial island in the Persian Gulf. Meanwhile, in a number of Arab countries, including the UAE, which has a significant coastline with coral reefs, the construction of artificial islands is doomed to ruin the corals of this region. The damage from the destruction of coral reefs affected the coast and countries, including Iran.

Government Response, Environmental Criticism, and the Palm Projects

The reaction of the UAE authorities to criticism of the construction of artificial islands in this country, in turn, looks very strange. The Palm project, one of the first projects to create artificial islands in the UAE, responded to environmental protests that they did not damage the ecosystem, and most of the coral reefs in the area were killed before. The ecology of Dubai, especially in the place where the first island was created, caused enormous damage. The area was an excellent reservoir of marine nature, and although much damage to the local ecology has already been done, we can still take care of restoring the remaining fauna and flora. Unfortunately, the UAE authorities are not engaged in a serious study of the consequences of this devastating project.

It should be noted that the construction of artificial islands in the UAE encourages other countries, including countries of the Persian Gulf zone, to do so. For example, Bahrain plans to build two artificial islands, Amvaj and Diorat. Sharjah, in turn, said that she was building an artificial archipelago Astronomy. Also, the principality of Ras Al Khaimah is planning to build the island of Surayya or Saray, and The Pearl-Qatar is no longer merely a development plan. It is an operational artificial-island development with about 52,000 residents and 22,000 residential units. (United Nations Environment Programme, 2019) The ten-year ecological prediction was a source-period scenario, not a verified current outcome; its environmental mechanisms should be evaluated against current project and monitoring data. As a result, the more delineated parts of the coast will become shallow, and the morphology of the Persian Gulf will change. This will disrupt the general sea cycle that promotes water exchange and the deposition of the waters of the Persian Gulf and the Oman Sea, its natural direction (from west to east) will change, as a result, pollutants will not be removed from the Persian Gulf. Along with this, the construction of artificial islands harms the marine bed, spawning place and the habitat of marine animals and causes irreparable damage to the environment.

Certainly, any changes in the ecological structure of the region, in particular in deep and ancient seas, have negative consequences for the environment, primarily for flora and fauna, and this damage is the lost link in the chain of artificial island construction. Despite the fact that according to international norms, states can create artificial islands just in their regional waters, the insurance of the earth of the Persian Gulf is an issue that all nations of a particular water territory ought to satisfy, satisfying their commitments to actualize the understanding of the territorial association for the security of the marine environment. The agreement signed by all the coastal countries of the Persian Gulf, including the UAE, in 1978 emphasizes that the waters of the Persian Gulf are international. All states should respect this territory, and construction works that jeopardize marine ecology are prohibited. The 1982 Convention on the Law of the Sea gave special attention to the need to protect marine ecology during the construction of artificial islands. The failure to damage the ecology, living and mineral springs that exist on the seabed and in the bowels is considered the main prerequisite for the creation of these islands since, according to paragraph 235 of the 1982

Convention, states are responsible for the support and protection of marine ecology. Certainly, neglect of such responsibility is fraught with terrible consequences for the ecology of the whole world.

References

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