

Ecological and Environmental Issues in the Context of Lakshadweep's Development

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Abstract: *The spectacular natural beauty of Lakshadweep is related to its location in the open sea fringed by large lagoon and a coral reef ecosystem. Because of this coral reef ecosystem, the ecology of this group of island has become distinctly different from that of other islands and it is very much vulnerable fragile. The coral reef ecosystem protects the islands from sea erosion by breaking the sustained wave action and considered the life line for the continued existence of the islands. The coral reef ecosystem is intrinsically hardly but it can be damaged or destroyed by major physical onslaught on it or by different kind of pollution, caused by the acceleration of diverse economic activities necessitated to sustain the growing human and cattle population of the islands. Thus, to sustain the natural beauty and also the very existence of the islands in its natural form, the ecosystem has to be protected by all means and in this context the developmental activities have to be so planned and formulated that they cause minimal damage to the island's ecosystem and the pollution of environment both on the land mass and sea around. The lagoon is also susceptible to influence both from the sea and the land. The major threats to the lagoon and pollution are sewage pollution, use of detergents, pesticides and fertilizers which causes eutrophication excessive use of propeller boats and speed which causes turbidity, dumping of plastic and other waste in the lagoon tourism related damages. The above suggestions can to reduce the imbalance of the ecosystem in Lakshadweep.*

1. Introduction

The coral island, known as Lakshadweep, lies irregularly scattered on the Arbin sea about 220 to 440km off the Malabar coast between 8° and 13° North latitudes and between 71° and 74° east longitude. Lakshadweep is the tiniest union Territory of India with an area of only 32 square kilometers. It consists of 36 island of when ten islands are inhabited. Besides are island named bangaram has recently been developed only for tourist. The other islands are very small in areas and uninhabited islands. The inhabited island are Andrott, Amini, Agatti, Chetlat, Kadamat, Kalpeni, Kavaratti (Head quarters of Lakshadweep), Kiltan and Minicoy. Because of the geographical isolation and for administrative convenience, the islands have been classified into four group forms a tehsil. The four tehsils are respectively named as, Andrott, Kavaratti and Amini. Out of the ten inhabited islands each of the islands Minicoy, Kavaratti, Agathi and Amini are treated as urban and the rest are considered as rural.

The spectacular natural beauty of Lakshadweep is related to its location in the open sea fringed by large lagoon and a coral reef ecosystem. Because of this coral reef ecosystem, the ecology of this group of island has become distinctly different from that of other islands and it is very much vulnerable fragile. The coral reef ecosystem protects the islands from sea erosion by breaking the sustained wave action and considered the life line for the continued existence of the islands. The coral reef ecosystem is intrinsically hardly but it can be damaged or destroyed by major physical onslaught on it or by different kind of pollution, caused by the acceleration of diverse economic activities necessitated to sustain the growing human and cattle population of the islands. Thus, to sustain the natural beauty and also the very existence of the islands in Its natural form, the ecosystem has to be protected by all means and in this context the developmental activities have to be so planned and formulated that they cause minimal

Damage to the island's ecosystem and the pollution of environment both on the land mass and sea around.

Features of ecosystem and Environment in Lakshadweep

- Lagoons
- Fish resources
- Corals and reefs
- Biodiversity
- Medical plants
- Climate conditions
- Pitti or bird sanctuary

The island of Lakshadweep are deprived of many a creation of nature. Birds like the omnipresent elsewhere crow are not find in kavaratti. Even in the resent past pitti has been delivered a sanctuary where no human interference is allowed this has done in the light of the close relationship between terns and the life of the island. When we have a close look at the formation of the islands geo-logically. It is said that the island have been formed to the deposition of dead corals and the classification of the guand-droppings. That way it is believed that the tens have been playing a vital role in the formation of the island.

1) Lagoon

A lagoon is the shallow body of water separated from a larger body of water by barriers of islands or reef. Lagoons are commonly divided into coastal lagoons and atoll lagoons. They are also identified as occurring on mixed sand gravel coastline. Coastal lagoons are highly productive ecosystems.

2) Fish resources

Marine fishery is the one of the core economic activity in Lakshadweep. The fishing in Lakshadweep was worked since the beginning of human settlement but in the original fisheries come into existence in islands around 1960. The water around the islands in very productive. Period between October and march is considered as the best season for fishing and more than 75 percentage of total quantity of

annual fish harvesting is done during period fishing operation during monsoon is hazardous.

3) Corals and reefs

Lakshadweep archipelago consists entirely of coral reef. The coral diversity of Lakshadweep is second only to that of the Andaman and Nicobar Island. The coral reef around the Lakshadweep islands has been adversely effected from time to time by global climatic factors. Corals represent the health status of the ecosystem. Any activity in the land, reef and lagoon and sea will have effect on the population of the coral. Accumulation of coral is continuing even now. The exposed coral rock erodes into white coral sand adds to the formation of land

4) Biodiversity and Medical plants

The warm tropical climate and high relative humidity are conducive for good plant growth. The vegetation of the islands is described as strand coral. Absence of the hills and river system s coupled with shallow soil severely limits the variety of plants that can grow in these islands, yet nearly 400 species of plants have been reported from these islands.

Inter planting medicinal herbs under the trees can be a better option to improve economic returns and ecological environment. In various places, medicinal trees in cooperated in home gardens improve the diversity in the fringe areas. Development of appropriate technique for raising medicinal trees in agro forestry and other farming system will help in conservation of many species.

Reasons for Ecological and Environmental issues in Lakshadweep

- Human settlement
- Fishing activity
- Coconut husk retting
- Air pollution
- Degradation of aquatic ecosystem
- Tourism
- Coral degradation
- Lack of awareness
- Water pollution
- Solid waste
- Soil Erosion
- Waste Disposal

1) Human settlement

Kavaratti, the administrative head quarters of the island. Andrott and Minicoy are three largely populated (out of ten inhabit anted island) and relatively more developed islands in Lakshadweep and have become the focus of various economic activities.

2) Fishing activity

Marine fishery is one of the core economic activities in Lakshadweep. In the forgoing mention has been made of excessive sedimentation and sediment transport which exert pressure on the marine environment of the island. The distributing effect of intensive fishing activity on marine habitat, particularly, the marine habitats near lagoons.

3) Coconut husk retting

In view of the significantly important position that the coconut production enjoys in the island's agriculture, both in terms of quantity and value the growth of coir industry has an immense potential. The raw materials for the manufacture of coir are the coconut husk. Retting of coconut husk in saline water through bio-chemical process is practiced in India to produce clear fiber of light golden colour free dirt which are further used for manufacture of various kinds of coir product.

4) Air pollution

Through the pollution potential of biomass grassfire is relatively low, it do produce air-borne emission such as SO₂, NO₂ and CO₂ though at a reduced level compared to coal or hydro carbons. The land requirement for storage of biomass and plant is also relative high. The predominant source of air pollution in the islands is diesel generations for power production. The main sources of increased noise level are the diesel generator based power plants. The indicative values show that the noise levels during day and the permissible limit for residential area.

5) Degradation of aquatic ecosystem

Increased transportation leads to increasing oil pollution of lagoon due to spillage white handing. The discharge of soak pit effluent and disposal of coconut piths will add to the nutrient enrichment process in the lagoon waters, leading to eutrophication This enhances the algal bloom, which will compete with corals resulting in coral mortality.

6) Tourism

The tourism sector has good potential for not only creating employment opportunities but also earning foreign exchange. In Lakshadweep, nature is at its colorful and pristine best. As an archipelago, the islands have a land area of 32 sq Km surrounded by 4200 sq Km of lagoon. It is the one of the most spectacular tropical island systems of the world. Though the islands are near the equator, the climatic temperature is usually much lower than that of the neighboring mainland. Even though the beauty and peace of these islands make these a haven for tourists, yet, the restrictions imposed on the entry of visitors and the remoteness of the islands from the mainland coupled with inadequate means of communication, have led to only a modest level of tourism related activities for the economy of the territory. Indiscriminate sport fishing, collection of ornamental fishes, lobster etc. scuba diving, reef walking, unrestricted movement of motorized boats, Anchoring of boats, spillage of oil etc. will lead to coral reef destruction.

7) Coral degradation

During the few decades there has been rapid development on there islands which has resulted in degradation of coral colonies on the reef floats as well as in lagoons.

8) Water pollution

Water covers 70% of the Earth's surface and makes up over 60% of the human body. Water pollution affects marine ecosystems, wild life health and human well-being. The leaching of diesel oil occurs in powerhouse compound further to spillage and leakage from oil storage barrels. The

conception of water containing fuel oils or their derivatives is reported to be carcinogenic on a long-term basis.

9) Solid waste

The garbage and other solid wastes will be too large a quantity in island tourism where all most all edible and non-edible things are imported. The discharge of raw or partially treated sewerage will have deleterious effects on water quality and biological systems. The organic wastes would cause nutrient enrichment in lagoon waters leading to eutrophication. Plastic containers and carry bags thrown in the lagoon and beaches smother living corals and cause sore to the eye respectively.

10) Soil Erosion

The thick canopy of coconut palms that covers almost every inch of the Waste Disposal islands, breaks the kinetic velocity of the rainwater. There is a thick growth of grasses and shrubs especially where there are no coconut trees and this provides adequate ground cover to neutralize the beating effect of rain drops. Coastal erosion by the sea ways is quite prevalent. Unfortunately coastal or wetland vegetation like that of mangroves elsewhere, which offered very effective wave breaking system, is generally absent in this islands.

11) Waste Disposal

Lack of appropriate facilities for safe disposal of human waste results in serious pollution of coastal waters around beaches, reefs and lagoons. The influence of the market economy has resulted in the increased use of non-degradable plastics, bottles and metal-based equipment and industrial effluents/oil spills resulting in problems associated with disposing of them when they become unusable. These wastes can result in serious health and pollution problems choking the ecosystem.

12) Coral degradation

During the past few decades there has been rapid development on these islands which has resulted in the degradation of coral colonies on the reef flats as well as in lagoons.

2. Suggestions

The ecology of the Lakshadweep Island compares not merely the land mass, but the continuum of the ocean, the reef in the shape of atolls, lagoons shores and the land mark. The deep seas are hot to innumerable varieties of flora and fauna, like most other oceans. The reef and the lagoon, however offer the uniqueness to the ecology of these islands, primarily due to the corals and the inhabiting polyp. For the protection of lagoons, here provides some suggestions they are following.

1) Sea shore Protection

The coastline of the island of Lakshadweep is subject to erosion and accurate as a natural phenomenon, besides due to human interventions. Production of the waste is necessary and is in principle, supported by the provision of the constant regulations.

The problem of coasted erosion, which is quite widespread in Lakshadweep, is covalently being tackled through laying

a mesh of concrete tetra pods, which restrict areas to and enjoyment of the beaches besides looking ugly. A more appropriate solution recommends is through cultivation of sea and though coasted forestry.

Lagoons and corals represent the health status of the ecosystem. Any activity in the land, lagoon, reef and sea will have an effect on the population of the corals. Dredging in the lagoons, building Jatties, collection of shingles, boulders, sand, movement of boats, will have directly impacts on the coral reefs.

2) Protection of the coral reef and the lagoons

The lagoons and atolls of I are home to a under variety of organism, lobsters, sponges, echinoderm, turtles, tuna and fishes and birds. These are in a delicate equilibrium with human beings and their related activation. Any plan for development of these islands needs to take into account the fallout on the biodiversity too. The strategy for this purpose would consist mainly of the protection of corals and document their diversity and impact of any departmental activities on the corals, listing of all bio resources, which include flora and fauna and recording of their diversity, frequency and density protecting the habitant of migratory birds, educating the local people about the importance of ecological issues and in listing their support in conservation activities, and encourage the indigenous system of medicines and developing an action plan for growing medicinal plans for local use. The creation of a bio-recourse Board for Lakshadweep and planning and monitoring is suggested.

Protection of the coral reef too deserves high priority in Lakshadweep coral reefs along with fringes of mangrove and sea grass bed environment constitute the natural protective mechanism for the ecosystem of this islands. Above all, coral reef provides Lakshadweep its unique identity, threat to the coral reef ecosystem cum from natural as well as manmade phenomena. It is necessary to develop monitoring mechanism for the former and for the latter peradventure measures in relation to server age discharge, solid waste disposed chemical pollution and over exploitation of sea life including fish marine invertebrates.

3) Disaster Management

Lakshadweep has been identified as susceptible to a variety of natural disaster this includes and flood slow and predictable hazards such as drought and coral bleaching, Sudden but unpredictable hazard earth quake and tsunamis besides other disaster management such storms, epidemics cyclones etc.

4) Modernization of Administration

The scattered nature of the island and the difficult means of island communication in Lakshadweep cell for innovation administrative arrangement. In the interaction of departmental needs with the inhabitant of the various island need to be arranged through video-conference system on a regular basis Government officers themselves need to be completely computerized and internet connection through internetworking compel e-government should be promoted.

5) Conduct Research study

To conduct in death study about the status of the coral and the lagoons. This has to be initiated by the Department of Environment and Forest and Depart of Science and technology.

- There has to be strict ban on the disposal of non-biodegradable toxic materials like plastic and batteries bottles etc.
- There should be a comprehensive plan to enforce stop page of disposal of pollutant by ship and pollutant from the island.
- People have to be made and one of the laws which pertain the protection of and corals. There is a popular misconception that coral debris shingles are dead remains and can anyway is disposed of as these do not contribute to the equilibrium of the coral reef or lagoon ecosystem. This calls for more intense awareness programmes which the Department can initiate in every island
- The building materials Board has to become more active in supplying building materials at subsidized rate for the public.
- Conduct environment and awareness programmes on Corals, wild life and lagoon conservation
- Training and awareness creation in eco-friendly tourism

3. Conclusion

The lagoon is also susceptible to influence both from the sea and the land. The major threats to the lagoon and pollution are sewage pollution, use of detergents, pesticides and fertilizers which causes eutrophication excessive use of propeller boats and speed which causes turbidity, dumping of plastic and other waste in the lagoon tourism related damages. The above suggestions can to reduce the imbalance of the ecosystem in Lakshadweep.

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