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MARINE LIVING RESOURCES OF THE UNION TERRITORY OF LAKSHADWEEP —

An Indicative Survey With Suggestions For Development

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22. SUGGESTIONS FOR ESTABLISHING A NATIONAL MARINE PARK IN LAKSHADWEEP

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INTRODUCTION

A marine park is a reserve and should be managed along sound ecological principles and should serve many relevant purposes such as habitat and species preservation, scientific research, recreation and financial gains (Ray, 1975). The deteriorating coastal and marine habitats due to many natural and man-made factors have generated a tremendous awareness among developing and developed countries in nature conservation and ecodevelopment. The marine and coastal habitats of India are also facing environmental crisis (Pillai, 1983, 1985) from many aspects and the worst affected habitat in this country seems to be coral reefs and reef resources. Proposals are in vouge to establish marine parks and preserves along the coast of India such as Gulf of Mannar (Silas *et al.*, 1985) and Malvan, Vengurla coast of Maharashtra (Quasim, 1980). First Marine National Park in Inida came into existence in Gulf of Kutch in 1980 (Rashid, 1985). Silas *et al.* (1985) have discussed in detail some theoretical aspects of selection and management of large marine preserves and parks. In this short communication some of the problems and prospects for establishing some coral reef reserves in Lakshadweep to generate scientific interest, additional income as well as conserving the endangered habitats (Pillai, 1985) are discussed.

Background: The Lakshadweep is mainly of coral origin and constitute 11 major islands (Kavaratti, Kalpeni, Agatti, Androth, Amini, Kadmat, Kiltan, Chetlat, Bitra, Bangaram and Minicoy) and a few submerged banks and reefs such as Veliyapani, Cheriyapani Pitty (Bird Island) Pitti 1 and Pitti 2 and Suheli. Coconut and tunas form the mainstay of the economy of these islands. In addition the minor and ancillary resources from the reefs are also exploited. Mining of calcareous sand which amounts to several thousand tonnes in the lagoon for starting small scale industry has been suggested. Since the islands have no infrastructure and raw material for starting any major or minor industry the greatest potential for additional income generation for Lakshadweep is the development of tourism (Anon, 1986). The islands with their palm fringed sandy shores, the crystal clear logoon with corals and coral fishes, the cultural heritage and the blue-waters around are potential paradise for tourists. These islands have been rightly known as Coral Paradise of India. However, development of tourism to a large scale in Lakshadweep is a matter to be decided on national policy. The establishment of marine parks in some of the islands can certainly serve the cause of tourism.

NEED FOR A MARINE PARK IN LAKSHADWEEP

All Lakshadweep islands are of coral origin and some of them like Minicoy, Kalpeni, Kadmat, Kiltan and Chetlat are typical atolls. The corals and associated fauna and flora form the most dominant marine benthic community in these islands. As already pointed out by Pillai (1985) and also discussed elsewhere in this publication the reefs and reef associated organisms of Lakshadweep in general are fast deteriorating due to natural and man-made causes. In many atolls like Minicoy, Kavaratti and Kiltan, mass mortality of corals due to human interference is severe. The terrestrial habitats have also undergone drastic changes due to total destruction of natural vegetation, mining of lime stones and sand stones for the preparation of lime and construction of houses; all natural corollary of expanding settlement and population pressure. The overall result is that the terrestrial and marine habitats of Lakshadweep are fast changing. It is imperative that conservation measures have to be urgently implemented in some of these

islands to preserve and protect these critical habitats for scientific, cultural and economic purposes. Selection of coral preserves and establishment of parks in and around some of the islands may serve this purpose. Lakshadweep can still boast of being the richest coral growing area around the Indian subcontinent, but it needs protection urgently. Establishment of marine parks and reserves can generate an additional income to the territory, if and when further development of tourism is effected.

Basic requirements for Marine Parks and preserves

Ray (1975) discussed in details the criteria to be observed in site selection, some of which are presented below and an attempt is made to evaluate the existing conditions in some of the islands in Lakshadweep.

a) Since a marine park basically should serve both recreation and education, the site selected should have existing or potential for infrastructure development.

b) The area should be deep enough to facilitate SCUBA and skin diving and should be safe for auch activities.

c) The benthic communities should be rich and varied for observation.

d) The climatic condition should be suitable for operation during a large part of the year.

e) The area should be "ecologically stable" in the sense that drastic natural changes though unpredictable should not bring forth cataclysmic changes in the ecosystem.

f) The area available should be sufficient enough and should be accessible for surveillance and eco-development, if necessary.

Suitability of Islands

Since most of the islands are relatively small and now thickly populated the land is scarce for any major development. This can, to a certain extent, put constraints on living quarters and tourist resorts. The marine habitat should be rich and varied. Inspite of these basic difficulties there may be more than one island in the archipelago to establish a marine park or national reserve. It may not be possible to apply the various criteria for selection with equal priority to all islands, since the priority will shift according to the purpose and function of the proposed park.

During the recent (January-March 1987) marine living resources survey of the islands by the CMFRI, Scientists paid some attention to examine some of these aspects in the various islands based on which the following islands were identified.

Minicoy: Minicoy has a vast and relatively deep lagoon The northern tip of the island is uninhabited and very narrow where once the Leper colony existed. The tuna fishery by traditional pole and line with live-bait is famous. Minicoy lagoon once had a luxurient growth of corals but today there is mass mortality due to human interference (Pillai, 1983). The lagoon looks barren since corals are very few. Further, imposing conservation measures on lagoon fishery and other minor resources will tell upon the tuna fishery. This is a place where user-conservationist conflict can reflect. Social and cultural problems are peculiar to Minicoy when compared to other Lakshadweep islands.

The adjacent Wiringili Island on the leeward reef flat is uninhabited and is a panoramic site with vast sandy lagoon stretching infront. However the present paucity of marine fauna in the lagoon as well as practical problems that may crop up in imposing conservation measures may be a major constraint for Minicoy.

Kavaratti: It is the Headquarters of the Union Territory and as such has got more credence. But recent survey has shown that the lagoon is mostly depopulated of corals. Land and other aminities may not be available. Existing tourist accommodation facilities include family huts and bathing huts. Further, shipping service to Kavaratti is more often than to other islands. The Headquarters of the local fisheries department at Kavaratti can get involved in the development and management of the Park. But the deteriorating environment and

anticipated developmental activities in tuna with other developments in the lagoon may not improve the natural condition of the lagoon.

Chetlat Island: In the northern Lakshadweep, Chetlat Island is one which still preserves the natural habitat to an extent in the lagoon. Exploitation of fishes and other marine organisms is limited. The lagoon has a luxuriant growth of corals. But the major problem is the shallow nature of the lagoon which gets partially exposed at low tide. Diving and swimming facilities are limited. Further' the island needs many more infrastructural facilities for tourists.

Kadmat: The beach is sandy. It is a typical atoll. The lagoon is deep enough for diving and swimming. The growth of corals is relatively profuse. Already family huts, honeymoon huts and youth hostels are available for the tourists. This island has many amenities that can be developed. Exploitation of living resources is not very severe. Regular tuna live-bait fishery is absent except when fishermen from Amini come to collect a few. Kadmat has potential and infrastructure that merit consideration for the establishment of a Marine Park.

Kalpeni: This island also is a typical atoll with relatively rich lagoon. The growth of coral is very good. At present there exists little living facilities for tourists. The advantage with Kalpeni is that it can serve as a central place from where conducted tours to nearby uninhabited Tilakkam, Pitti, Cheriyam and other places could be arranged. The area-wise coverage for the marine park and reserve will be much more in this island. The entire island along with the nearby uninhabited banks and islets can be declared as a marine sanctuary or park with the administrative nucleus at Kalpeni. It is also understood that the interference from local people in the lagoon habitat is not of a severe magnitude.

The above facts indicate that each of the islands considered has certain merits and demerits and priority should be given only after due consideration of administrative and practical aspects.

CONSTRAINTS AND PROSPECTS

User - conservationist conflict: The reefs and reef resources of Lakhadweep are the mainstay of local people for construction material, fish and other food items. It is true that the local administration has banned the exploitation of corals and lime stones for construction work in these islands. Live corals are also not permitted to be removed except for scientific purposes. The local people seem to have traditional rights of exploitation of live-baits from the lagoon. The traditional tuna fishery of Lakshadweep chiefly thrives on the availability of live-baits which are caught from the lagoon. Imposing restrictions on the live-bait fishery can trigger user conflict and hence needs a critical study, especially in islands like Minicoy. A high level committee including the representatives of the local people should examine this traditional rights of exploitation before a park is established in any of the inhabited islands.

Demarkation of zones for fishing, exploitation, diving, scientific studies and replenishment without disturbance is likely to confront practical difficulties since the area available in each island is small. However, in a national marine park and preserves such demarkation of zones is a must for its successful management. These aspect needs careful consideration before proposals are made for the establishment of a marine park.

Priority on criteria for selection of sites: The physiography, fauna and flora, environmental condition, infrastructure available, developmental feasibility, economic viability and socio-economic conditions of the island should be given due emphasis in the final choice of the park.

Scientific value: Since the corals and coral associated fauna of most of the Indian waters are fast deteriorating due to many reasons it is imperative that we should carefully preserve some areas in Lakshadeep for scientific research

and protection of the habitats. The economic viability and gains alone should not be criteria.

MANGEMENT ASPECTS

Ecodevelopment : All efforts should be made to protect and propagate the natural atoll vegetation which is fast disappearing from almost all atolls It is worth trying planting of trees like *Calophyllum inophyllum*, wild betham, *Thespesia populnea*, bread fruit (*Artocarpus incissa*) and screw-pines along the beaches that may provide shore protection to an extent, rather than introducing further exotic plants from the mainland.

It was observed that introduction of sea grass from Kavaratti to Chetlat lagoon was very successful by a local man. The introduced grass has established well in many square meters. This should be tried in places where there is a lack of seagrass bed in the lagoon. It will enhance productivity and, will form excellent forage ground for lagoon fishes and turtles. Further, they act as effective sediment trappers and prevent silt transportation upstream by erosion of the shore by wave action into the lagoon.

Restoration of the deteriorating and micro- and micro-habitats in the lagoon and reefs should be attempted. Enrichment of lagoon corals may be possible if hard substratum is provided at sites where there is least interference from silt. This will favour the settlement of planula larvae.

Even in small islands, total preserves of several square meters of area should be selected upstream and left totally undisturbed which should help in the propagation of species by natural ways. There should not be any involvement of wanton ecological disturbance at the selected zones. Since establishment and management of Marine Parks and reserves in this country is a new concept few persons may be trained abroad for the effective management.

Display stones, markings etc. should be effectively displayed. Strict surveillance should be observed to assess the research needs and modifications required.

Financing should be from the central authorities and Lakshadweep Administration can manage it.

The Tourism Development Corporation should have an active role in this.

Regulations : Effective implementations of certain regulations will become necessary in the effective scientific management of a marine park and reserves. Dredging in the lagoons should be avoided as far as possible. If dredged the soil at any cost should not be deposited in the lagoon or on reef flats (eg. Minicoy, Kiltan where this has resulted in death of corals in large areas). Blasting of the reef flats should be stopped.

Collection of corals and other reef organisms from the reserves should be restricted and certain zones may totally be banned (Regulations already effected by Administration). Sport fishing should be banned in the lagoon habitat and explosives and use of poisons should never be allowed. Sport fishing by tourists on a minimum level may be allowed in reef front only. Anchorage damage, diver damage, reef walking, turning of corals boulders etc. that can cause damage to marine denizens in the park should be minimised. At any cost collection of aquarium fishes and bait fishes for economic purposes should not be allowed in the reserved zones. All efforts should be made to protect the lagoon shores from sea erosion and subsequent sediment interference (already effective). Introduction of animals of economic importance and aesthetic value in the habitat may be done after careful assessment of the species interaction.

Construction activities along the near shore areas and lagoon in the reserves should be minimised.

The most important problem in all the Lakshadweep islands is the lack of hygiene on the beaches. Clean beach is a *sine qua-non* for the development of tourism. Sanitary conditions should improve and a public

awareness has to be created among the local people against polluting beaches.

Preparation of Red data book on endangered species as well as threatened species in the habitat should be done and strict surveillance against their exploitation made.

Only some general guidelines are presented above and the *Modus operandi* and functional viability of the various aspects need careful assessment and implementation.

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