

NATIONAL MARINE PARKS

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ABSTRACT

There is an immediate necessity for the conservation of marine flora and fauna in the islands of Gulf of Mannar. The situation as it is to-day needs the establishment of a National Marine Park in the area. 20 islands surveyed during the years 1977-81 have revealed the extensive destruction of fauna and flora by human interference. The island system is unique in that it serves as a habitat for many endangered species like the marine turtles, the dugong, the ptychoderan *Balanoglossus*. Extensive destruction of the fringing coral reefs around islands has been noticed and it is imperative that this destruction should be totally stopped. The paper outlines measures for the establishment of a viable National Marine Park system in this area and also indicates the need for a national policy for establishing Marine Parks elsewhere along our coast.

INTRODUCTION

THE OBJECTIVE behind the conservation of nature is to ensure perpetuation of the living world and the natural resources on which all living things depend for their scientific and cultural values and the long-term economic and social advancement of mankind. This underlines the significance of conservation programme for the wise use of natural resources in areas where the plants and animals are of particular importance or where the area is well known for its historical, geographical, cultural or scientific importance. Apart from these considerations there is also a school of thought that the marine animals have a right to exist much as we would claim that right for man. And that right is an absolute one rather than a desideratum to be weighed relative to the right to existence of other creatures or human populations partially dependant on exploitation of that species. Today, there is world wide awareness among biologists about the conservation values. Several developed countries have enacted rules and regulations regarding exploitation of natural marine resources

and pooled their experience and mutual interests to establish international forums for effective implementation of conservation policies in respect of renewable natural resources. Thus we have today in many countries of the world, Marine Parks, Reserves and Sanctuaries with well defined objectives, rules and management systems in operation. In this context international organizations like IUCN and World Wildlife Society are rendering great service. In India which has endless varieties of very rich natural marine living resources the spectre of senseless and indiscriminate exploitation of living resources in the seas around leading to denudation of areas, destruction of habitats and total annihilation of rare animals and plants is looming large. Unless endangered species are protected and a pragmatic approach to exploitation is followed the situation will lead to total destruction and disappearance of many valuable marine animals and plants. Rapid industrialization, human settlement, intense fishing pressures in coastal zones, dumping of unwanted wastes, increasing pollution problems, extensive destruction and modification of marine habitats in the promotion of techno-economic advances, reclamation of coastal wetlands and deforestation of mangroves and unplanned tourism development are

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all activities which accelerate and accentuate the seriousness of the problem thus adding to the plethora of difficulties.

Realising the imperative need for an interdisciplinary approach in studying the problems of coastal area developments with due considerations for ecological problems, recalling the resolutions concerned with marine parks made by international gathering like First World Conference on National Parks, U.S.A., 1942 and Eleventh General Assembly of IUCN, Canada 1972, Second World Conference on National Parks, U.S.A., 1972 as well as those from regional meetings and symposia and recognising the usefulness of a net work of national parks and nature resources, man and biosphere programme concerned with promoting the conservation of areas and genetic resources through the establishment of a co-ordinated series of biosphere reserves, action has been initiated in India also to identify critical marine habitats and examine the feasibility of setting up National Marine Parks.

The present paper reviews the situation as it is today highlighting the essential need for establishing a National Marine Park in the Gulf of Mannar. As part of a team the authors have undertaken extensive survey of the islands in the Gulf of Mannar during 1977 to 1981 and made an indepth study of various aspects including an appraisal of human perturbations and interference to Marine habitats. The damage caused to the marine habitats by natural calamities occurring in this cyclone prone region has also been taken into consideration.

BACKGROUND OF SURVEY

As early as in 1953 the Madras Fisheries Department took cognisance of the fact that the collection and removal of the rare protochordate *Ptychodera flava* from Krusadai Island in the Gulf of Mannar will exterminate the

species and denude the natural habitat, if permitted uncontrolled. A restrictive order was issued banning collection of *Balanoglossus* from the island environs. In 1960, the Central Marine Fisheries Research Station expressed great concern about the indiscriminate butchering of the sea cow *Dugong* caught alive in the nets along the Ramanathapuram Coast and suggested legislative measures to stop exploitation of this unique mammal. As a follow up of this the Tamilnadu Government directed the Collector of Ramanathapuram to take punitive action against offenders. But the inadequacy of proper supervision and lack of facilities to the vigilance agency have left much to be desired in preventing clandestine operations. These are instances to show that the awareness was there. What was needed was a collective action at the regional and national level on a constructive basis to evaluate the magnitude of the problems, identify areas requiring immediate attention and set up agencies to prepare action plan for the implementation of conservation measures. The Government of Tamil Nadu being very much interested in the protection and proper conservation of its natural marine resources requested the CMFRI in 1976 for technical assistance in the critical appraisal of the problem of indiscriminate exploitation going on in the coastal areas of the state, particularly in the island ecosystem of the Gulf of Mannar.

CRITERIA FOR SELECTION

A team of the scientists of this Institute based at Tuticorin started conducting an elaborate scientific survey of the region between Tuticorin to Mandapam (08° 47'N - 08° 15'N Lat. and Long. 78°12'E - 79°14'E) wherein are situated 20 islands. Since this region happened to be a *unique one*, the zone ranks high in priority as the islands are 'one-of-a kind'. The area includes *sub-climax* and *transition* zones and other areas which are subject to natural changes

subsequent to natural disasters like cyclone havoc. There is a natural *diversity* where several habitat types and biotic associations are met with. The *criticalness* of this area is a vital point *viz.* important life stages of entire life histories of species depend on the area e.g. coral formation, breeding of reef associated molluscs, spore settlement and growth of economically important seaweeds.

The zone covers all habitats indicative of *inclusiveness*. The fringing coral reef area surrounding all the islands is *fragile* and the degree of threat is greater due to the proximity of mainland's coastal fisherfolk settlements and growing facilities for enabling easy accessibility. One aspect of the ecological criteria that would ultimately decide the eligibility and desirability of the area to be declared as conservation zone is to establish the *feasibility*. No doubt, these islands rank high in international and national value as evident from the voluminous mass of scientific information on the fauna and flora especially on fisheries in and around the area.

IMPORTANT FINDINGS OF THE SURVEY

In order to ascertain the feasibility, the project 'Island Survey' commenced on 1977 and was completed in 1982, in two stages. The first stage of study was a cursory one extending for a period of 3 months based on which a preliminary report was brought out by the Institute in 1977 itself giving some basic facts about the need for the creation of a National Marine Park in the Gulf of Mannar. Subsequently an indepth study of the ecological set up of the subtidal areas of the fringing reef upto 5 m depth as well as terrestrial fauna and flora of the islands was undertaken.

A detailed document based on the voluminous data collected and analysed was submitted indicating strong ground which warranted the creation of a National Marine Park in the Gulf of Mannar. More recently the Government

of Tamilnadu constituted a Committee on Marine Park establishment for delineating the marine park area in the Gulf of Mannar.

Apart from concentrating upon the specific objectives of the survey of islands, the scientists also gathered valuable information about other areas of interest for the development of marine fisheries and fishing industry.

Salient features of our above investigations and the suggestions offered thereof are given below.

1. The entire island ecosystem is unique in the east coast of India-not found anywhere else along the east coast. All islands surveyed show the existence of fringing coral reef formation, particularly on the seaward aspect almost as a continuous barrier, barring a few places. More than 90 species of corals of branching type and the boulder type are encountered. These harbour a rich variety of coral reef fauna and flora, typical and some rare species of gastropods like cowries, cones, volutes, murices, whelks, strombids and chanks. Special mention should be made *Cyprea talpa*, *C. tigrinus*, *C. caput serpentis*, *C. onyx*, *Comus amadis*, *C. textile*, *Strombus canarium*, *Murex adustus*, *Voluta lapponica*, *Murex haustellum*, *Cymbium melo*. All these are commercially valuable species and exploited all the year round. The disturbance caused to the habitats while removing them upsets the rhythm of their reproductive cycle.

2. The live, branching type corals of *Acropora* spp. and *Montipora* sp. are hacked and taken out for decorative purposes thus attenuating the growing surfaces. This results in decay of injured sections and subsequent gradual destruction of the fringing reef proliferation.

3. The split and wash of the coral reef, caused by the wave action and natural forces,

constitute a strong base for marine algal growth. After successive accumulation it also constitutes solid inner core for the island beach formation and growth of island land mass. These are scoured and collected by hundreds of fishermen for use in lime manufactures. Naturally this act weakens the island base.

4. Luxuriant growth of industrially important weeds like *Sargassum*, *Turbinaria*, *Gracilaria*, *Gelidium* and *Gelidiella* are being removed daily by about 500 fishermen from the shallow and intertidal regions surrounding the islands. It is estimated that about 5000 t are thus exploited annually. This creates imbalance in the ecosystem.

Because of the seine net operations and other net fishing activities going on, in and around the islands the beds of sea grass *Cymadocea* spp. and *Thalassia* spp. adjoining the islands are constantly disturbed and the grass are also destroyed. Extensive beds of these species of sea grass are located in this area and happen to be the only foraging grounds for the sea cow *Dugong*. The operations thus disturb the natural feeding and resting grounds of *Dugong* which is one of the rare mammals needing protection.

5. Indiscriminate fishing of *Dugong* by operating special wall net is going on almost daily capturing a few hundreds a year for the value of its meat. Although the activity is limited now for fear of legal proceedings, policing is very poor and needs stricter measures. Otherwise there is every possibility that these mammals would cease to exist in this area.

6. The islands possess gently sloping sandy beach of considerable expanse and these are found to be the nesting grounds for the sea turtles. With the help of islands based stake net operations and wall net operations fishermen catch the turtles coming ashore for laying

eggs and destroy potential stock. The fishermen also have an uncanny knack of spotting the areas where the laid turtle eggs remain concealed and dig them up. Thus the danger of depleting population of sea turtle in the zone looms large and constant interference by human agencies might result in this area becoming barren of turtle population.

7. Thoughtless chopping down of trees in the wooded interior in the islands has been going on. Stumps of trees like *Acacia* sp. and *Thephrosia* sp. are evident in the vast majority of islands. In some islands no trees exist now. This is not only not good for the safety of the islands, but also has been affecting the rhythm of arrival of migratory coastland birds for rookery.

8. Destruction of the mangrove vegetation lining the water front by fishermen is evident in all the islands. This process if allowed unchecked would denigrate the mangrove ecosystem biologically upsetting the growth of mangrove associated fauna and also drastically deprive the fishes and marine reptiles of the cool shady hideouts and resting places. These shady areas are also the nursery grounds for several lakhs of fry and fingerlings of milkfish, mullets and prawns which occur in this area. Further, removal of mangroves has also led to erosion in many places.

9. By far the most degrading activity that has been evident in all the islands surveyed was the quarrying of live and dead corals, particularly of *Porites* spp. and other boulder types. Since the right of removing coral blocks, to serve as raw material for large-scale industrial purposes, had been leased out by Tamilnadu Government extensive damage has been done by thoughtless removal of coral blocks over a number of years. The 'Symposium on Corals and Coral reefs' organised by the Marine Biological Association of India

in 1969 focussed attention (Mahadevan and Nayar, 1972) on the magnitude of exploitation (25000 t/year) and expressed the opinion that it was undesirable. This had its effect and the quarrying of coral stones was ordered to be stopped by the Government. But the system of monitoring and detecting illicit removal was found, during survey, as unsatisfactory.

Due to the operations carried on by industrialists in the earlier years one or two islands like Manauli east and Poovarasanpatti Theevu have been completely razed to the water level; what remains get exposed only during the low tides. In several islands it could be seen that fishermen were stealthily digging up stones from the islands interior (e.g. Puzhukunchalli Theevu) leaving behind craters and deep pits. Thus the entire process had been responsible for creating topographical changes in the islands which fact is bound to be reflected in future years on the nearby mainland coast also.

10. Intensive trawling for prawns by mechanised boats within the close range of the islands, perch trap fishing going on in the surrounding reef area and shore seine operations done with the islands as base are all permanent source of fishermen interfering with and disturbing the natural habitat.

Viewed objectively it may be mentioned that the damage done to the ecosystem of the islands is really alarming and it may be safely concluded that unless the area is brought under conservation the pristine glory of the reef system here would be lost. The conclusions drawn were clearly brought out by Silas *et al.* (1985) pleading for the immediate establishment of a National Marine Park in the Gulf of Mannar.

In this context pertinent points like zoning and principles involved, delineation of boundaries, developmental programmes, management, administration, policing, regulations,

recreational and educational facilities, biological supervision and reappraisal deserve strategic consideration so that the creation of Marine Park will yield desired results.

GENERAL CONSIDERATIONS

Marine Parks and Reserves are rightly becoming a very important subject of concern to many countries of the world. In addition to the above pleas for the National Marine Park in the Gulf of Mannar there are several other aspects, in other zones of our country such as the protection of unique plants, animals and fishes that are likely to disappear if sufficient care is not taken. At present barring the Marine Park in Pirotan Island; and a proposed one in Malvan area in addition to that off Mandapam - Tuticorin Coast proposed now other marine areas are little known. The concept is now an important aspect of UNESCO's Man and the Biosphere programme through the creation of biosphere Reserves which will fulfil such an important role in maintaining natural diversity. Integrated coastal area management and development programme of our country is at present engaging the attention of the Department of Environment of the Government of India. There is an urgent need, therefore, to identify areas of priority importance for ecosystem conservation and demarcation as reserves along the coast as well as estuarine areas. The recent focus on the mass nesting of the olive Riddley turtle along the Gahirmatha Coast of Orissa and along the other beaches on the east coast has drawn attention to the need for protective measures, as recommended by the recently concluded Workshop on Sea Turtle Conservation at Madras in 1984. It was considered necessary to include under the jurisdiction of Bhitarkanika turtle Sanctuary in Orissa other areas of equal significance so that the mangrove ecosystem and beaches can be protected to form a biosphere for Bhitarkanika-Gahirmatha area to benefit turtles, crocodiles

and other vulnerable species. In Tamilnadu, Point Calimere area is already a declared wildlife sanctuary for migratory birds. Similarly, areas in Lakshadweep, Suheli, Veliyakaran, Bangaram, Thinnua kara and Parali Islands need close study as possible reserve areas. Great Nicobar & Andaman Islands also rank high in our priority list for conservation of such animals as turtles, crocodiles, *Turbo* and *Trochus*.

Destruction of mangrove vegetation to promote recreational facilities and for establishing industrial units is a coastline challenge and policy makers will have to take this aspect into consideration. Commercial leasing out of estuarine zones of rivers by State Governments for quarrying of shells from the estuarine beds should be controlled by seeking advice from a National Committee on Parks to be set up. The example of Kali River estuary in Karnataka being exploited like this has shown how it is in conflict with other fishing interests.

Depending on the magnitude of problems and keeping in mind the values attached to promoting the rich cultural and traditional heritage of the coastal areas of different maritime States, long-term national level control with international co-operation is envisaged since creation of National Marine Park cannot be restricted to the domains of regional management alone. Keeping in mind the possibility of bringing contiguous interstates areas to be considered as a Unit. Uniform policies and guidelines have to be followed. The most important aspect is funding such projects. This should be best left to a Central Agency, free from the limitations of local budgetary

provisions. It is advisable that the Department of Environment is vested with this responsibility for overall management. Scientific research should be preserved as a part of the future set up in order to maintain data on environmental quality and interpret dynamic equilibrium. Several cadres of competent personnel should be trained for handling conservation programmes. The legislation imposed should be adequate and implemented carefully without conflicting with local people. It is ideal if educational and fisheries authorities co-operate since the interests of the educational institutions should also be kept in mind.

Considering all the above points of view an Advisory Panel as a Scientific Committee of ecologically oriented specialists, special interest groups, environmental lawyers and land use planners can be constituted to formulate long term goals, chalking out guidelines, determining research needs, defining function of each reserve/park/sanctuary, drawing up management programme, surveillance, advise on regional problems and evolve a National policy.

Pending finalisation of a National Policy atleast one National Marine Park has been set up in the Gulf of Kutch and two are in the anvil one in the Gulf of Mannar and the other at Malvan-Vegurla (Maharashtra Coast). In the symposium on endangered Marine Animals and Marine Parks held in India in 1985 and earlier to it at the Workshop on Sea turtles Conservation held in India in 1984 several valuable papers were presented based on which action plan for future implementation were also formulated and sent to the Government of India, Department of Environment. The time is appropriate for collective action.

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