

# Integrated Island Management Plans (IIMPs) for Lakshadweep Islands

## MINICOY ISLAND

*Submitted to*

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## 1. Background

1.1. As the island communities strive to raise their standards of living with increased connectivity and changing life style with threatened fragile natural ecosystem '*Integrated Island Management Plans (IIMP's) for Lakshadweep islands*' was prepared for the UT Lakshadweep Administration by Centre for Earth Science Studies. The preparation of IIMPs was in accordance with the guidelines provided in the Island Protection Zone (IPZ) Notification, 2011 of Ministry of Environment and Forests, Government of India (Enclosure-I).

1.2. The IIMP encompasses the existing and proposed developments, conservation and preservation zones, dwelling units including the infrastructure projects such as schools, markets, hospitals, public facilities, etc., The IIMP consists of a detailed spatial plan for all the development activities covering

- (i) the entire island area landward from High Tide Line (hereinafter referred to as the HTL);
- (ii) land area between HTL and Low Tide Line (hereinafter referred to as the LTL) which will be termed as the Intertidal zone;
- (iii) the lagoon area within the territorial water limit (12 Nautical miles or 20 km).

The activities permissible (see Annexure-I) and the no-development setback determination criteria (see Annexure-II) are as prescribed by the MoEF.

1.3. Majority of the listed information in the guidelines were collected from the islands during the different field visits. The digital data base on cadastral scale 1:4000 scale maps were utilized for mapping the different physical characteristics of the island. Locational information of the islands such as dwelling units including the infrastructural facilities was collected using Global Positioning System (GPS). Areas indicating the dwelling units including the infrastructure projects were mapped. The conservation and preservation zones were mapped separately. The entire island including the Lagoon aquatic area has been considered for the plan preparation. The data on coral reef classification of the lagoon waters mapped at eco-

geomorphologic level during 2007 utilizing the high resolution satellite imageries viz., IRS P6 LISS III/LISS IV Mx were used with limited field check-up and has an accuracy at 90% confidence level<sup>1</sup>. The entire field data were incorporated in ARC-GIS platform and IIMP is prepared in 1:4000 scale. Though the MoEF guidelines direct to prepare the IIMP in 1:10,000 scale, the final map is prepared in 1:4000 scale for better clarity of the plan, considering the smallness of the island. These maps once approved can also be enlarged at 1:2000 scales for each panchayat ward of the island for offering better clarity.

1.4. The major thrusts of IIMP in the islands are the conservation and preservation zones which are basically the major coastal habitats of the island ecosystems. The management of these habitats is based on well understood linkages among human activities and changes within a natural system. The known uses of the coastal habitats are classified as non-extractive, extractive and transformative. Non-extractive uses refer to activities such as recreation, research and education which do not involve removal of material from the habitats or do not have serious impacts. Extractive uses involve removal of renewable resources such as fish, ground water, mangrove wood, etc. Transformative uses (such as coral extraction, waste disposal without treatment, etc) result in negative changes in habitat characteristics and function. Sometimes there is a degree of overlap among the uses. The major coastal habitats of the island are coral reefs, sea grass beds, sand dunes, lagoons, sandy beaches, and the like.

In the islands the extensive coral reef formation is seen both inside and outside the lagoon waters. Normally coral reefs are present in the depths exceeding 1-2 m depth in the lagoons and are beyond the wave breaker zone. In the outer reef areas it is present up to 30 to 40 m depth. The biophysical survey of coral reefs conducted during 1999-2002 period by the Lakshadweep Administration has indicated presence of live corals in the ranges of 14% to 24%. The areas bordering the above zones are declared as buffer zones. The remaining areas can be called as Non-coral reef areas. Similar classification applies to sea grass areas also.

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<sup>1</sup>Bahuguna, A. and Nayak, S, 1998. *Coral reefs of the Indian coast – Scientific Note, Space Application Centre, Ahmedabad.*

1.5. In the IIMP weightage is also given for upgrading the physical and social infrastructure in the island. For social infrastructure there should be adequate primary health care facilities with a minimum of beds / high schools / primary schools / nursery schools / madrassas, safety in fire control and telecommunication of required standards. A general college / ITI with hostel facilities is possible in only one of the larger Islands. If on stilts and of 2 stories these could also double up as emergency / cyclone shelters. Primarily, existing provisions have to be upgraded in terms of land built space and facilities. Organized open spaces for settlement and neighborhood (ward) level parks / play grounds exist and are being upgraded often with built facilities / equipment for different resident age groups. The same applies to the island level sports ground.

1.6 In terms of physical infrastructure, potable water is generally in short supply in most Islands. Desalination plants fill up the gap in Kavaratti, Agatti and Minicoy. This facility is to be installed in all islands. For sewage disposal two pit flush septic tanks are in place. Oxidation ponds offer alternatives according to soil conditions. Solid waste disposal / management pose problems and alternatives to sea dumping / Incineration needs being explored. Electricity is generated through diesel. These needs being supplemented by alternate sources, of which solar panels and windmills are favored alternatives.

1.7 Demand for new private housing / households is not in the UT as the decadal growth rate has been and continues being well below the national average. In fact the bulk of the demand for new housing is in the government sector through standardized houses and at two storeys'. Private houses are being constantly upgraded and incrementally extended through permanent material and often at two storey's. In this scenario, households seek direct access from roads or common pathways. They seek better social / physical infrastructure, other amenities and better livelihood avenues. Also, as land is primarily with the community, home stay facilities are possible only through expansion of houses and not through new houses within the habitation zone. Even these should have the majority concurrence of the grama sabha before being processes.

1.8. The IIMP is thus prepared keeping in view the directions in the Notification dated 6.01.2011 issued by MoEF (Enclosure-II) and the order dated 11.05.2012 (Annexure-V) of the Hon'ble Supreme Court. The preparation of IIMP should be in the context of the Environment (Protection) Act, 1986 and the development of tourism shall be after considering its impact on the livelihood of the island population and other related vulnerability issues as per the directions of Supreme Court contained in Annexure-V. The following are the main components considered while preparing the IIMP:

- i. Land use zones strong on conservation / protection related issues so as to promote the sustainable development of the UT;
- ii. A supporting list of non-compatible / prohibited uses within each land use zone;
- iii. A simple set of building bye-laws and related development control regulations with provisions for building, fire safety, health, sanitation, etc.

1.9 The High Power Committee constituted as per the direction of Hon'ble Supreme Court (See Enclosure-III) have examined in detail the criteria for fixing the coastal setback area, i.e. '*No Development Zone*' (between High Tide Line and Setback line) where developmental activities are either restricted or prohibited. The objects of providing such a No Development Zone (NDZ) as provided in the CRZ Notification are the following: (Details in Annexure)

- i. Protection of life and property against erosion, storm surge and sea level rise due to global warming.
- ii. Protection of ecologically vulnerable coastal habitats, special, natural or scenic sites.
- iii. Ensuring public access to the beaches
- iv. Avoidance or minimising the cost of investment on coastal protection work and adoption of eco-friendly methods.
- v. Prohibition or regulating the different types of activities taking place in the coastal zone to maintain the balance between developmental goals and environmental objectives.

## **2. IIMP for Minicoy Island**

2.1 Minicoy is the second largest inhabited island in the UT of Lakshadweep. Minicoy is unique and has the social and cultural characteristics of republic of Maldives more than the other islands in the archipelago. The island is elongated with an area of 4.37sq km and island is about 1.6 km in the width at the broadest part. The important features of island are large deep lagoon of approximately 30.6 sq km in area and extensive coral reef on the south western side. Fish mass production is the flourishing industry that led to the establishment of canning factory. Besides the people are artistically talented and are engaged in the manufacture of house hold utensils.

### **2.2 Extent of Setback Area**

2.2.1. The coastal setback area is a '*No Development part of a Zone*', which refers to the strip of coastal area (between HTL and Setback line) where developmental activities are prohibited or otherwise restricted. The criterion by which the setback line is demarcated is outlined in Annexure-II. The no-development setback or buffer zone in the island is determined on the basis of its differential exposure to natural hazards, availability of free space and whether the island is habitation or non-habitation area.

2.2.2. The setback line for Minicoy is determined on a scientific basis by dividing the island into different segments as explained in Annexure-II. In the Minicoy island habitation area or developed area are mostly clustered on the southern and central part of the island compared to the northern part. Thus it is possible to have a different setback distance for the habitation and non-habitation areas. Based on the scientific approach as outlined in the Annexure-II a lesser setback distance is assigned for the habitation area, whereas the portion of the island which has sparse settlement or non habitation with more open space is provided with a broader setback distance as a conservation measure.

2.2.3. With the above approach the non habitation area or a sparsely settled area of the island on the northern part is provided a minimum setback distance of 35 m. The area which is thickly populated or habitated area is provided a minimum 25 m setback distance. The setback zones are demarcated in the Plan.

### **3. Highlights of Minicoy IIMP**

The IIMP in the island (see Map-1) is discussed on the matrix of uses of permitted / prohibited activities within the major landuse category such as lagoon, local habitation and non-local habitation areas. The present IIMP is proposed for the ten year period 2011-21. The plan can be revisited as and when required and accordingly updated. Even its perspective can be changed to beyond 2021. Some of the major aspects relevant to each of these categories are also highlighted below.

#### *3.1 Existing Land Use*

Minicoy is the second largest island in the Lakshadweep group. The pressure of the population in the island is medium in comparison to other islands. Physiographically, the shape of the islands resembles a crescent shape. The elevation of the island ranges from 2.0 to 3.0 above mean sea level. There is a long patch of land with an elevation ranging from 3.5 to 4.5 m above MSL. There is a large, deep lagoon of approximately 30.6 sq km in area and an extensive coral reef on the south western side.

Nearly 40% of the island area is covered by residential use with settlement clusters intermingled with rich growth of coconut grooves and other activities as seen on other islands. There is a jetty located on the western part of the island which led to the harbour area occupied with typical government offices and public facilities such as a hospital and post office. The existing road network covers nearly the entire length of the island. The western half of the Island is occupied with large pockets of open spaces with sparse vegetation. There are no defined green areas in the Island. In the Minicoy Island, out of the total land area of 440 ha, 311 ha of the

Island area falls under built up category while 109 ha is under open spaces and 20 ha is under roads and transportation (Master Plan of Lakshadweep Islands, 2025).

### *3.2 Existing Residential Area*

Major settlements are confined to the central part of the island. They are mainly coming under the survey plots 2A, 2B, 2C, 2D, 2E, 3A, 3B, 3C, 3D. The 2011 census report shows that the population of Minicoy is 10444. Minicoy shows a decadal growth rate of 24.96 for 1981-2001 census. Nearly 40% of the island area is covered by residential use with settlement clusters. Total no of households in Minicoy are 1583.

### *3.3 Existing & Proposed Conservation and Preservation Areas*

The conservation and preservation schemes of the island are the major ecosystem such as coral reef, lagoon water including the religious, cultural establishment, monument, major institution and natural resources of the island. Corals are the major ecosystem of the islands. Minicoy islands was also much affected by the bleaching event. Twelve percent of live corals are present in reef slope. The reef flat of eastern side consists of dead coral boulders. Coral growth in lagoon was seen in patches. Most of the corals seen in lagoon were *Porites* sp. New recruitments of corals are coming in reef slope. Minicoy Island has a deep lagoon of around 30.6 sq km in area in southwest, which is fourth largest lagoon within the inhabited islands. Lagoons provide good opportunity for fishing and tourist activities. Mosques / madrassas are the other conservation spots in the island. The other institutional conservation areas are lighthouse, jetties, school, tourism destination and fish landing centers in and around jetties.

### *3.4 Existing and Proposed Development Schemes*

All the existing and the proposed development schemes for the coming 10 years have been mapped in consultation with the Lakshadweep Administration (2011-21). The existing schemes has 426 government establishments such as Naval administrative office, AE office, Harbour departments, Indoor stadium, PWD store, Fire force station, Police station, Govt. press, IRB, National Information Centre, Indian Meteorological Department, Deputy Collector Office etc. While the proposed

development schemes are 39 in number which includes Bio mass plant, jubilee hall, light house, LPG godown, canning factory, slaughter house, slip way, museum, passenger hall / scanning centre, power house etc. All these are shown in IIMP. All the proposed development schemes are outside the setback zone or NDZ and are permissible activities.

### *3.5 Existing & Proposed Infrastructure Facilities*

The major Infrastructural facilities included in the plan are construction of new jetty, extension of existing jetty, cargo jetty, slipway , fisherman mini harbour, coast guard air strip, low landing platform, indoor stadium, construction of homeopathy hospital, construction of civil station, construction of state guest house, tuna canning factory, construction of jubilee hall, over head tanks, desalination plant, etc., Minicoy records the highest share of traffic between island and mainland. On the whole Minicoy recorded the third highest share in the total average passenger traffic by ship. There is a proposal for an airport in the island. At present there is only a helipad . In cargo traffic Minicoy records the third highest percentage share in total cargo traffic between island and main land.

### *3.6 Existing & Proposed Tourism (Resorts and Recreational) facilities*

The tourism sector has enormous potential in Minicoy since it has good transport facilities existing and proposed , between main land and also between the islands. The lagoon coast which is located near to the jetty bordering the island has a stable beach. In the south there are some tourist huts located adjacent to the helipad within a distance of 200m. The wide beach near to the tourist huts are a major attraction to the tourists. The beach tourism is allowed in an area where the beaches are traditionally accreting / stable, subject to conditions in annexure- II of LICRZ (1997).

- All tourism related project shall be based on carrying capacity of islands, which refers to the capacity of an ecosystem to sustain specified resource uses.
- The activity should not permit the destruction of corals.
- No construction of hard structures on the seaward side of the corals.

- No disposal of untreated sewage or effluent including the non biodegradable waste in to the lagoon water by the tourist related activity.

### *3.7 Coastal Protection*

Coastal erosion is a serious problem faced by the island. Compared to other island Minicoy lacks good protection structures. Seawalls were built with tetrapods many locations in the island especially in the lagoon side and near to jetty. Though these structures are effective in controlling the erosion, the beauty and accessibility of the beach is considerably compromised. Submerged artificial reef is an alternate scheme to protect the beach without compromising the beauty of the coast. Vegetative protection is another soft option.

### *3.8 Existing & Proposed Sewage Treatment*

As per the 2011 census data, Minicoy island has a population of 10444 persons i.e 15.65% of the total population of the U.T of Lakshadweep. The steadily increasing population, high gross residential density and ongoing development activities are resulting in a rate of sewage generation beyond the capacity of natural treatment and assimilation. Sewage treatment and disposal is inadequate or non-existent. Detailed studies need to be undertaken to identify the gap between sewage and solid waste collection and disposal and necessary mechanisms need to be developed.

### *3.9 Existing & Proposed Drinking water facility*

The static storage of fresh ground water in the Minicoy Island is 1.83 MCM and dynamic storage potential is 0.56mcm. The development potential of an aquifer is proportional to the quantum of dynamic storage that replenishes annually. The static storage, on the other hand is used to tide over the water requirement of such contingencies as drought. Thus low levels of static and dynamic storage potential of fresh ground water in Minicoy is a cause of concern and immediate intervention is required to limit the fresh water extraction from island groundwater lens to

sustainable yield. Rain water harvesting is already implemented in the island. To augment the drinking water facility a Low temperature desalination plant has been established on the eastern side of the island.

### *3.10 Non-conventional energy system*

At present power is mainly generated through diesel sets. Installed capacity has been increased from 5270 KW to 8120 KW and through this uninterrupted power supply is being provided in the islands. Diesels generator sets are highly polluting. Diesel has to be brought from the mainland in barrels. During the transport of diesel from the main land there is every chance of spillage and leakage leading to the pollution of land and groundwater. Noise and air pollution are also caused during the operation. The plant is located in the densely populated areas compounding the pollution effects on the people. There is a growing demand of power for fishery and tourism related industry. To meet the growing requirement of power in the island the administration is planning to bridge the gap through non-renewable energy systems.

## **4. Permission for Development Activities in the Different Land use Zones**

Based on the existing landuse pattern, the Minicoy island is broadly classified into three broad land use zones viz., lagoon zone, habitation zone and non- habitation zone. The lagoon zone is further divided into Preservation and Conservation Zone. This is basically a '*Prohibited Use Zone*' wherein the development activities are to be permitted and regulated only through the Administrator, bearing in mind the fragile eco-system to be protected and as highlighted in the IIMP. The habitation zone comprising predominantly the southern and central portion of the island is Regulated Development Zone (RDZ-I). This is a also '*Regulated Zone*' with a setback area, which has a no-development zone (NDZ) incorporated in the IIMP. Most of the islanders reside in this zone. Therefore the incremental and sustainable growth of the zone is to be undertaken in their interest with a control by the Panchayat / Grama Sabha for developments in Habitation plots / areas. The southern part of the island has potential to grow further on tourism front. The

Regulated Development Zone (RDZ-II) is less habitation area which is mostly on the northern part of the island which has mixed land use characteristics. This is a *Potential Development Regulated Zone* with a no-development zone (NDZ) incorporated in the IIMP Map. The population density of the zone is considerably lower than RDZ-I1 and therefore new land uses are infused for regulated development opportunities. Utilizing the different land use zones in the island a simplified Development Control Regulations (DCR's) and Building Bye-laws are provided in the Annexure-III. Permission of LCZMA, Lakshadweep Environment clearance and approval from the Island District Panchayat are to be obtained wherever applicable as provided in the Annexure- II.