

Integrated Island Management Plans (IIMPs) for Lakshadweep Islands

ANDROTH ISLAND

Submitted to

Department of Science & Technology
UT Lakshadweep



Centre for Earth Science Studies

Thiruvananthapuram – 695 031

August 2013

CONTENTS

1. Background
2. IIMP for Androth Island
 - 2.1 Androth
 - 2.2 2 Extent of Setback Area
3. Highlights of AndrothIIMP
 - 3.1 *Existing Land Use*
 - 3.2 *Existing Residential Area*
 - 3.3 *Existing & Proposed Conservation and Preservation Areas*
 - 3.4 *Existing & Proposed Infrastructure Development Schemes*
 - 3.5 *Existing & Proposed Infrastructure Facilities*
 - 3.6 Existing & Proposed Tourism (Resorts and Recreational facilities)
 - 3.7 Coastal Protection
 - 3.8 Existing & Proposed Sewage Treatment
 - 3.9 Existing & Proposed Drinking water facility
 - 3.10 Non-Conventional Energy System
4. Permission for Development Activities in the Different Land use Zones

List of Annexure

- Annexure-I: Regulation activities in the islands
- Annexure-II: Fixing Setback Area in the Islands
- Annexure-III: Development Control Regulations (DCR's) and Building Bye-Laws*

List of Enclosure

- Enclosure-I: Guidelines for preparation of IIMP
- Enclosure-II: IPZ Notification, 6th January, 2011
- Enclosure-III: Notification dt. 16.05.2012 issued by the Lakshadweep Administration in terms of the Order of Hon'ble Supreme Court*

List of Maps

- Map-1: Integrated Island Management Plan (IIMP) for Androth island*
- Map-2: Land Utilization Map*

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-1).

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 level¹. 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.

¹Bahuguna and Nayak, 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-2) and the order dated 11.05.2012 (Enclosure-3) 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 Enclosure-3. 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-3) 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 Androth Island

2.1 Androth is the nearest to the main land with an area of 4.83 sq.km. It has an East-West orientation with no lagoon. The island is thickly planted with coconut trees, which yield the finest nuts available in the territory. The island occupies the whole interior of the atoll. Except at the northeast extremity the reef flat is exposed at low tide. The corals were blasted extensively and a breakwater has been constructed. Since the island witnessed the first success of Islam in the archipelago (664 A.D) and it contains the tomb of the Saint it has sanctified value. Due to absence of lagoon, there is sparse lagoon fishery in the islands. The islanders have specialized in octopus and dolphin catching. There are many artificially made hills in Androth and interesting myths and facts associated with each one. Androth also has small valleys, which are used as water retention plots where a variety of agricultural species are grown. The western side of Androth witnesses a unique phenomenon every year during and after monsoon. This area called 'Moola' has a block of shifting white sand, which keeps moving from the north to south.

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-III. 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 Androth is determined on a scientific basis by dividing the island into different segments as explained in Annexure-III. In the Androth island local habitation area spreads more or less uniformly throughout the island. There is no defined clustered settlement on any one side or part of

the island. Thus it is possible to have a uniform setback distance for the entire local habitation area. Based on the scientific approach as outlined in the Annexure-III a uniform setback distance is assigned for the habitation area. The sparse settlement or non-local habitation area seen on the central part of the island is also considered as conservation measure.

2.2.3. With the above approach the entire island is considered as a habitation area and is provided a minimum setback distance of 35 m. The setback zones are demarcated in the Plan.

3. Highlights of Androth 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, habitation and non-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

Androth is the largest island. It is 1062 meters at its widest point in the western part of the island. The extreme eastern portion is narrow with an average width of 412 meters. The island has a dense coconut plantation all over the island, which is uniform throughout, which yield the finest nuts available in the territory. This is the only island where the plantation has not intruded into the low-lying areas in the middle of the island, where rice was grown in olden days. There are few neem, papaya and breadfruit trees as well. The residential area scattered around almost all over the island. An upper 1 to 2m thick layer of disintegrated coral boulders are observed. Below this layer there is a compact but porous crust of limestone conglomerate. The thickness of the crust is about 0.3 meter. A bed of fine sand, which acts as permeable, layer through which there is constant filtration of fresh water underlies the limestone. Unlike the other Lakshadweep group of islands, Androth tends E-W and is surrounded by tidal flats and coralline beach. The

beaches are covered with boulders and pebbles on the open coast and sand and pebbles beaches on the northern side of the island.

3.2 Existing Residential Area

The settlement spreads throughout the island. The residential houses are concentrated within a small area with compounds adjoin one another. Settlement distributions are mainly coming under the Survey no.5b, 4c, 4b, 4a, 4d, 4a, 3d, 3c, 3d, 2c, 3d, 8b, 8c, 9a, 9b, 11b, 10c, 10b, 7b, 7c, 7a, 7d, 6d, 6c, 3b, 3a, 2d, 2b, 2c,1c and 1b as in the cadastral map of the island. The 2001 census reports that the population of Androth is 10720, with 5356 males and 5364 females. Androth has a steadily growing population. Androth showed a decadal growth rate of 17.52 for 1991-2001. The population density in 2001 is 2215/sq km as against 1419/sq km in 1991 and 810 sq/km in 1951. The literacy rate has increased from 63% to 84.74% to the total population for 1991-2001.

3.3 Existing & Proposed Conservation and Preservation Areas

The conservation and preservation schemes of the island are the major ecosystem such as coral reef including the religious, cultural establishment, monument, major institution and natural resources of the island. Corals are the major ecosystem of the islands. In Androth Island the coral growth on the reef flat is extensive. The western and southern side, reefs were in good condition compared to other sites. Androth reef were much affected by 1998 bleaching event but are now recovering fast. Androth is the only island amongst the inhabited island in the Lakshadweep group that does not have a lagoon. Due to the absence of lagoon the lagoon fishery is sparse. Mosques / Madrassa are the other important religious places in the islands. The other institutional conservations are lighthouse, jetties, school, tourism destination and fish landing centers in and around jetties are also demarcated as conservations zones.

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).

From the 144 government establishments such as Coast Guard Station, Harbour Departments, Indoor stadium, PWD store, Coastal Police station, Govt. Press, IRB, FCI Godown, Electricity Board, Post office, Solar plant, Employment office etc., while the proposed development schemes are 41 in number which includes Civil station, Dairy Farm, Desalination Plant, Slip way, Science Park, passenger hall, Poly Technic College, LPG Godown, Warehouse etc.,. All of the proposed development schemes are coming outside the setback line 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, construction of new air port, homeopathy hospital, civil station, desalination plant, etc. Androth records the highest share of traffic between island and mainland.

3.6 Existing & Proposed Tourism (Resorts and Recreational facilities)

The tourism in Lakshadweep Island could be developed as a priority by considering the existing infrastructure facilities and closeness between the islands. The beach tourism is allowed in an area where the beaches are traditionally accreting / stable, subject to conditions and also as listed 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

Seawalls have been built in many location of the island. Though these structures are effective in controlling the erosion, the beauty and accessibility of the beach is reduced. New environment friendly and tourism friendly measures can be thought of.

3.8 Existing & Proposed Sewage Treatment

As per the census data 2011, Androth island has a population of 11191 persons i.e 17.67% of the total population of the U.T of Lakshadweep. It is the largest inhabited island in the Lakshadweep group. The steadily increasing population, high gross residential density and ongoing development activities is 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.

3.9 Existing & Proposed Drinking water facility

The static and dynamic storage potential of fresh ground water in the Androth Island is 6.99 MCM and 1.68 MCM respectively both higher than the overall average of the inhabited islands. 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 comparatively high levels of static and dynamic storage potential of fresh groundwater in Androth need to be maintained and intervention is required to keep the fresh groundwater extraction from island lens to the sustainable yield.

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 through barrels. During the transport of diesel from the main land there is every chance of spillage and leaking 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 Androth island is broadly classified into two broad land use zones viz., lagoon zone and local 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 local habitation zone spreads throughout the island is *Regulated Development Zone (RDZ-I)*. This is a '*Regulated Zone*' with a setback area which is 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 northern and eastern part of the island has potential areas for beach tourism and related activities. There is no RDZ-II in the island. The population density of the zone is considerably lower on the central part of the island 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 is applicable as provided in the Annexure- II.