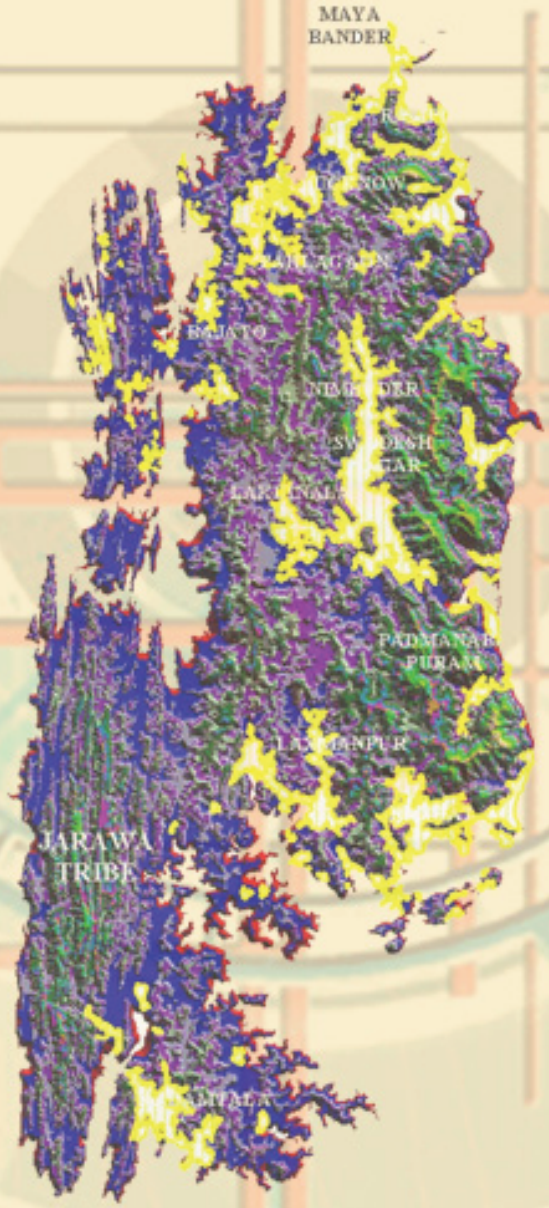
MASTER PLAN FOR MAYABUNDER

DELINEATION AND CONCEPT



TOWN AND COUNTRY PLANNING UNIT
ANDAMAN PUBLIC WORKS DEPARTMENT

MASTER PLAN FOR MAYABUNDER

DELINEATION AND CONCEPT

Town and Country Planning Unit

Andaman Public Works Department

June 2009

CHAPTER NUMBER	TITLE	PAGE NO
1.0	INTRODUCTION	1
1.1	NEED AND IMPORTANCE OF MASTER PLAN	2
1.2	AIMS AND OBJECTIVES	3
2.1	APPROACH	3
3.1	DELINEATION OF PLANNING AREA	6
4.1	DEVELOPMENT ISSUES	13
5.1	POPULATION FORECASTING	16
6.1	DEVELOPMENT STRATEGY	17
7.1	DEVELOPMENT CONCEPT	19

MASTER PLAN FOR MAYABUNDER

1.0 INTRODUCTION

1.0.1 The history of Andaman & Nicobar Islands also known as Emerald islands or Shaheed and Swaraj islands has a primitive history dating take to 2nd century A.D. These groups of islands played a major role during the colonial periods of Indian history. With the habitation of tribal people, the islands witnessed gradual process of urbanization through subsequent habitation of islanders, patriots and settlers from the mainland. Except the name of PORT BLAIR as the capital of Andaman and Nicobar islands other settlements and places are less known to the people of India. There are several settlements and islands in this group which gradually show signs of urbanizations. With the declaration of Port Blair as an international terminal and efforts taken by the Government of India, these groups of islands are likely to come to more prominence in future years.

1.0.2 Towards guiding future development of the Andaman and Nicobar islands, the State Development Report 2006 was prepared which was followed by the Coastal Area Assessment Report by Equations and the Ecological Sensitive Architecture Report by Expert Committee constituted by Ministry of Urban Development India. Realizing the complexity and interrelationships of issues, and the need to have an integrated approach towards sustainable regional development, the Town and Country Planning Unit of Andaman Public Works Department (APWD) had taken the lead role in initiating the preparation of Master Plan for Mayabunder and its environs.

1.0.3 Mayabunder with a population of 3182 (2001 Census) is District Headquarters of North & Middle Andaman region. Mayabunder Sub Division is characteristic in terms of its beaches, dense forests, large tracks of agricultural fields intercepted by hilly terrain. The real challenge in the preparation of the Master Plan for Mayabunder comes from the basic issue of guiding physical development in future along with considerations for sustainability, minimum ecological footprint and carrying capacity within the broad framework of environmental conservation. Towards preparation of Master Plan for Mayabunder this report focuses on Concept Development after analysing various issues at macro and micro level.

1.1 NEED AND IMPORTANCE OF MASTER PLAN

1.1.1 The need for preparation of Master Plan for Mayabunder in general is regulating developments both in terms of control as well as to promote. The plan will also focus on prevention of incompatible land uses, encourage growth in an orderly manner and ensure regulated traffic movements. Importance of Mayabunder as one of the tourist spots in the Mayabunder Sub Division requires upgradation of all tourist facilities like transport, accommodation and facilities related to hospitality sector. Mayabunder also has to become sustainable in terms of economic development through eradication of unemployment in the region. These call for certain pro-active decisions to make Mayabunder a stable and sustainable entity. At the same time this region popularly known as "food bowl" of Andaman Islands with a total of 28% under agriculture and 29 % under forest needs to keep the ecological foot print to the minimum. Such a complex situation throws challenges in promoting economy and a suitable strategy is required to guide it towards sustainable development.

1.1.2 This can be done only when a statutory instrument like Master Plan is prepared. As per the ANI Town and Country Planning Regulation (1994), no development of land shall be undertaken or carried out in planning area by any person or body (including a department of government or the administration) unless permission for such development has been obtained in writing from the Town Planner. The importance of Mayabunder Master Plan is felt as a sequel to its status as a sub division of Andaman District in Mayabunder Tehsil, showing emergence of several developmental issues. It is likely under such circumstances development in and around Mayabunder may get accelerated without any kind of regulation or order. Hence the need and importance.

1.1.3 Master Plan lays down the space requirements for the coming years judiciously by allocating the land for the use of various purposes such as residential, industrial, commercial, recreational, public and semi-public, etc. It also proposes macro level network of roads, street pattern, and traffic circulation taking into account of the present and the future requirements. The plan also identifies areas required for preservation, conservation and development of historic, architectural, ecological interest and educational research. The Master Plan also forms the basis for all concerned infrastructure building agencies of the Union Territory and the local

governments including the Mayabunder panchayat in formulation of their future programmes and projects. Development Regulations incorporated as part of the Master Plan serve as a tool for realizing the plan objectives. Violations of the provisions of development regulations are like the violation of any other law.

1.2 AIMS AND OBJECTIVES

1.2.1 Master Plan for Mayabunder and environs aims to develop it into self sustaining community with all the socio economic development to result in the enhancement of quality of life. Simultaneously the plan also aims to conserve and preserve the existing ecologically fragile environment. The main objectives of the Master Plan for Mayabunder are:

- Transform the Mayabunder & environs town towards self reliance and as a sustainable entity.
- Increasing the economy through optimal use of tourism industry along with its inherent capacity as a centre of food production and distribution.
- Regulating new physical entities and activities considering its potential as a growth centre, to absorb them.
- Encouraging orderly spatial development in tune with the ecological footprint and carrying capacity of the Mayabunder Tehsil.

2.1 APPROACH

2.1.1 Evolving a development concept is an important stage as it guides the formulation of required development policies and strategies for future. Having collected required preliminary, primary and secondary data about Mayabunder an extensive visual and reconnaissance survey was undertaken as a first step to record unbiased, first impression about planning issues. **The untapped picturesque bounty of beaches, guest houses, busy and unregulated commercial streets, the deplorable condition of fishing settlements, and certain stretches of beaches, pollution of land and some beach fronts, blighted areas in certain pockets of settlements, well designed and maintained government buildings, deserted and passive harbour rarely used, similarly used helipad, busy moving people for their trade and commerce,**

pleasant array of school going children do create a strong positive and negative images of Mayabunder and environs.

2.1.2 The second step was convening of a public hearing with elected representatives, executives and government officials to discuss various issues requiring consideration in evolving a strategy for sustainable development. While the proceedings of the meeting oriented towards accelerated development by exploiting tourism and fishing, the limitations in terms of terrain and availability of land for development and accessibility from other parts of the island was analyzed that retard such a development. Stress was laid on capitalizing on the "Aiyara" fish catch and up gradation of a full-fledged fish landing jetty with facilities for marine food processing and cold storage. The representatives felt that restoration of the practice of passenger and cargo vessels to touch Mayabunder en-route to Port Blair will help to develop the settlement. A major issue pointed out during the meeting was scarcity of water supply which at present is augmented through limited springs in the Karmatang area and the need for a sustained supply of water resources. Coupled with this the issue of proper disposal of solid and liquid wastes was stressed. Members also stressed the importance of Mayabunder environs as a "food bowl" of Andaman Islands and required a strong connectivity to other parts.

2.1.3 The third step towards concept development is a detailed analysis of land use that would help to evolve a physical plan. Examination of the land use of the region reveals that there is a contiguous development of land from Mayabunder towards South West upto Pudumadurai and South East direction towards Karmatang. While Mayabunder is fully developed in terms of various land use zones with no forest or water body, other settlements indicate presence of these. Secondly the entire development in the region is based on the presence of Andaman Trunk Road which acts as the life line and termed as "Spinal Cord" of Andaman Islands as mentioned in the Regional Study prepared by the Ministry of Urban Development in 1987. The only exception is the settlement of Tugapur which is observed to develop on a secondary road network branching off from ATR. The land use also reveals that the developments are linear like "ribbon" on both sides of ATR except in those areas where they are intercepted by forests.

2.1.4 Next to Mayabunder the abutting settlements of Pokhadera and Lucknow show intense land developments. With limitations brought by the sea on the south in certain directions, Mayabunder has already come under pressures of further development. The density of 85 persons per hectare is more than the recommended density of 45-75 persons per hectare for small towns as per UDPFI guidelines for such terrain areas. The density suddenly decreases to 12 persons per hectare in the adjacent village of Pokadera and to 4 persons per hectare in Devpur and Lucknow. It is as low as two persons per hectare in other settlements in the environs. Therefore the development concept should address the spill over impact in the adjoining settlements. Thirdly the land use analysis reveals that forest lands are dominant with as much as 37 percent in Danapur to a maximum of 70 percent in Pudumadurai. Analysis also reveals that lands under water body are prevalent with as much as 6 percent (157.9 hectares) in Tugapur to as high as 13 percent (31.5 hectares) in Webi.

2.1.5 The fourth step revolves around understanding of the strength, weakness, opportunities and threats by making SWOT analysis. From the three steps already completed the analysis is done.

The strength and opportunities of Mayabunder region are:

- Picturesque environmental setting including a land form as a catalyst to augment tourism.
- Endowment of untapped marine resources and forest produce.
- Possibilities to identify and conserve cultivable lands to make the region a 'granary' for the agricultural produce towards sustenance in terms of food.
- High literacy rate of 73% and per capita income.

The weakness and threats are stated below:

- Contiguous narrow and linear strip of land between sea and reserved forest preventing efficient compact urban development.
- High degree of inaccessibility not only from the mainland but from within the islands coupled with poor transportation network and facilities.
- Prevalence of habitation in the forest lands.

- Limited infrastructure and community facilities coupled with rising unemployment.
- Limited carrying capacity throwing challenges in terms of sustainability.
- Poor quality and state of housing stock especially in the government sector and fishing community.

2.1.6 From an understanding of these four steps it becomes imperative to demarcate a spatial entity beyond Mayabunder and hence delineation of planning area for close examination of issues is called for. As observed already with a density of 84 persons per hectare (vide Table.1), Mayabunder cannot intensify further. The future population of the settlement needs to be distributed in the environs keeping in view-accessibility, availability of vacant lands and ecological importance. Delineation of planning area as an important spatial planning exercise is done based on certain specific parameters. These are discussed subsequently. Having delineated the planning area as the fifth step, specific development issues and strategies are discussed. Simultaneously the population projections for the delineated area for the planning period ending 2029 are forecasts scientifically. The last step is to arrive at a development concept that will form the basis for the prospective Master Plan.

3.1 DELINEATION OF PLANNING AREA

3.1.1 Mayabunder Tehsil is the largest in terms of area (1348 sq.km) compared to Diglipur and Rangat of North & Middle Andaman District. It has six Panchayats of which Rampur, with all seven villages and Pahalgaon with only four villages which are continuous abutting Mayabunder and Aves Island 3.5 km., away across the sea have been taken up for consideration (Table No. 1, Map No. 1). Delineation of planning area as mentioned already is an important step to discuss more specific issues of Mayabunder environs. It is done on the basis of trends in the existing development and potential for future growth to make Mayabunder environs sustainable. Delineation has been done after analyzing the settlements under various parameters. The settlements adjoining Mayabunder have been analyzed based on certain indicators, as follows:

- Residential area to total settlement area
- Forest area to total settlement area

- Available urbanisable area to total settlement area
- Density of population
- Percentage of primary workers to total workers
- Availability of community facilities around Mayabunder (within 15 km.)
- Proximity to Andaman Trunk Road (within 5 km.)

A total of twelve revenue villages in the two Panchayats and Aves Island were initially taken up and examined. The following is the list of thirteen revenue villages taken up for consideration.

Table No. 1 List of Revenue Villages in Mayabunder environs.

Sl.No	Name of the Revenue Village	Area (in ha)	Total Population (2001)	Density (persons/ha)
1	Aves Island	15.90	2	Neg.
2	Danpur	108.56	592	5
3	Devpur	123.37	450	4
4	Karmatang	622.27	1201	2
5	Lataw	79.26	179	2
6	Lucknow	176.43	686	4
7	Mayabunder	37.70	3182	84
8	Pahalgaon	856.53	1326	2
9	Pokadera	150.73	1840	12
10	Pudumadurai	607.92	391	1
11	Rampur	430.25	765	2
12	Tugapur	1051.41	1733	2
13	Webi	253.84	476	2
	TOTAL	**4514.17**	**12823**	**9**

Source: Census of India – 2001

MASTER PLAN FOR MAYABUNDER

Map No. 1 Mayabunder And Its Environs

3.1.2 Of the above villages considering their population (more than 500), urbanisable vacant and other lands (more than 35 %), percentage of non-primary workers to total workers (more than 50 %), and considering the spread of water body (more than 30 %), eleven villages have been selected for inclusion in the planning area. These are –

Mayabunder	**Pokadera**	**Danpur**	**Rampur**
Lucknow	**Lataw**	**Devpur**	**Karmatang**
Webi	**Phaelgaon**	**Tugapur**	

Of these, Tugapur though the percentage of primary workers is 70% considering its population (1733) and towards preservation of water bodies (6%) and agricultural lands (37 %) it was considered for inclusion. The revenue villages proposed for inclusion in the planning area is shown in Map No. 2.

3.1.3 Among the remaining villages Avis Island though 3.8 kms from Mayabunder across sea with a population of "two" and filled with forest area 83% and Agriculture 17% is omitted from the proposed planning area. Pudumadurai considering proximity factor 22.8 kms from Mayabunder with forest area of 70% and agricultural land 19% was not considered for inclusion.

3.1.4 Development strategies evolved in any Master Plan have a bearing on the manner in which the land is put to use and hence land use zoning becomes an important component of the plan. In order to arrive at a development concept it is essential to study the pattern in which land is put to use at present within the proposed planning area. Some of these aspects are already covered in para 2.1.3.

3.1.5 Specific land use analysis of the proposed Mayabunder Planning Area (provided by the Town & Country Planning Unit of the APWD) covering eleven settlements reveal that Agricultural lands 37% (1458.18 hectares) and forest lands 27.5% (1085.25 hectares) and constitute a major share. A striking factor is the category of other lands aggregating to 19.4% (764.46 hectares) which needs close examination for proper utilization in future. These along with vacant lands 3.1% (121.50 hectares) can absorb all the future expansion requirements of Mayabunder. Except Mayabunder (40%) the lands under residential use is very low and is approximately 8 %. About 20% of lands under Institutional and Public use in Mayabunder indicate concentration of

government and private institutions which requires examination for balanced distribution.

3.1.6 Mayabunder is the only one settlement which has one percent of primary workers. Adjacent settlements like Pokadera, Lucknow, Danpur and Pahalgaon have less than 20% primary workers. All the remaining settlements have predominantly agricultural base. Tugapur has more than 70% of primary workers. This requires close examination for improving the economic base of the region through secondary and tertiary sectors. Finally two settlements viz. Tugapur and Webi have substantial area under water bodies with 57.9 hectares and 31.5 hectares respectively can be considered for some of the tourism activities. The tabulated land use distribution in various sectors is shown in Table No.2.

MASTER PLAN FOR MAYABUNDER

Map No. 1 Mayabunder And Its Environs

Table No. 2 Land Use Distribution – Mayabunder Planning Area (Proposed) - 2008

Sl.No	Name of the RevenueVillage	Total Area(ha)	Land Use (ha)								
			Residential	Commercial	Public	Industrial	Vacant	Agriculture	Forest	Water	Others
1	Danpur	108.56	18.91 (18.2)	0.66 (0.6)	1.02 (1.0)	0.00	1.61 (1.6)	38.58 (37.1)	36.70 (35.3)	0.44 (0.4)	6.08 (5.9)
2	Devpur	123.37	8.96 (7.3)	0.53 (0.4)	0.61 (0.5)	0.00	5.70 (4.7)	93.63 (76.6)	9.65 (7.9)	0.24 (0.2)	2.92 (2.4)
3	Karmatang	622.27	17.07 (2.9)	0.20 (0.03)	10.73 (1.8)	0.00	0.24 (0.04)	390.31 (65.4)	135.95 (22.8)	26.81 (4.5)	15.16 (2.5)
4	Lataw	79.26	9.09 (11.8)	0.74 (1.0)	1.69 (2.2)	0.22 (0.3)	1.55 (2.0)	60.55 (78.7)	0.00	1.24 (1.6)	1.77 (2.3)
5	Lucknow	176.43	28.84 (16.8)	0.28 (0.2)	4.19 (2.4)	2.06 (1.2)	7.59 (4.4)	47.43 (27.5)	75.54 (43.9)	3.49 (2.0)	2.74 (1.6)
6	Mayabunder	37.70	95.86 (40.1)	6.08 (2.5)	47.82 (20.0)	0.00	35.27 (14.8)	3.76 (1.6)	0.00	0.00	50.00 (20.9)
7	Pahalgaon	856.53	12.62 (1.5)	0.86 (0.1)	2.35 (0.3)	0.00	3.13 (0.4)	64.40 (7.9)	88.63 (10.9)	8.04 (1.0)	635.68 (77.9)
8	Pokadera	150.73	28.30 (19.6)	0.64 (0.4)	4.21 (2.9)	0.31 (0.2)	44.55 (30.9)	40.61 (28.1)	13.42 (9.3)	0.70 (0.5)	11.60 (8.0)
9	Rampur	430.25	22.82 (5.6)	0.27 (0.1)	1.33 (0.3)	0.00	0.00	246.14 (60.4)	114.96 (28.2)	8.32 (2.0)	13.60 (3.3)
10	Tugapur	1051.41	22.41 (2.2)	0.66 (0.1)	3.73 (0.4)	0.15 (0.02)	21.55 (2.1)	381.08 (37.4)	509.54 (50.1)	57.91 (5.7)	20.78 (2.0)
11	Webi	253.84	15.19 (6.2)	0.20 (0.1)	1.19 (0.5)	0.00	0.27 (0.1)	91.64 (37.4)	100.82 (41.2)	31.50 (12.9)	4.07 (1.7)
	TOTAL	**3890.35**	**280.13 (7.1)**	**11.16 (0.3)**	**78.92 (2.0)**	**2.76 (0.1)**	**121.50 (3.1)**	**1458.18 (37.0)**	**1085.25 (27.5)**	**138.74 (3.5)**	**764.46 (19.4)**

Source: Town and Country Planning Unit-APWD

N.B: Figures in brackets indicate percentage to total area

4.1 DEVELOPMENT ISSUES

4.1.1 The SWOT analysis at a macro level identified certain issues in terms of Mayabunder region. The predominant ones are topography, accessibility, tapping of marine resources, strengthening agriculture for sustenance in terms of food, limited infrastructure development and carrying capacity. These require further examination which can give a clue to evolve a development concept aimed at sustainability.

4.1.2 TOPOGRAPHY: Analysis of landform and topography reveal that the identified planning area is surrounded with forests on all sides except Mayabunder which is surrounded by sea on West, North and East. These forests on the south rise to an altitude of 101 metres above MSL and slopes towards sea on West, North and East directions. With an average width of 0.75 kms of urbanisable land it becomes challenging not only to harvest surface runoff from the southern hillocks but also to properly plan for zoning of land use. The Andaman Islands located in the region of Seismic Zone – V and Mayabunder by virtue of its size and location with sea on three sides is subjected to a higher degree of vulnerability. Intensification of development has to be thought of carefully. Dispersal may be considered in the rest of the region, which is characteristic of ribbon development.

4.1.3 ACCESSIBILITY: The greatest and prime factor for development and progress of any region is its accessibility in terms of transportation network and mode of travel. Though Mayabunder is only 245 kms from Port Blair linked by the ATR (Andaman Trunk Road) it takes 10 hours after negotiating the ferry services and cutting across the Jarawa sector. By sea it is only 85 Nautical Miles (153 kms) and it takes a gross time of 8 hours. Limited link service from Port Blair to Mayabunder is an issue. Helipad is not affordable for most tourists and is subjected to weather condition, which restricts tourist movement. All these discourage easy access and retards not only trade and commerce but also tourism accelerated development. Risk perception among tourists to reach tourist spots like RamNagar Beach, Curtbert Bay Beach, Karmatang Beach, Interview Island, North Reef Island and other Turtle nesting grounds and Mangroves prohibit movement of tourist and flourishing of tourism industry. In terms of intra island connectivity Mayabunder is located off the ATR branching at Lucknow and hence is a dead-end despite lovely beaches. Tourism movement up to Karmatang (Beach) via Rampur through narrow road is limited

which again is a dead-end. Tourism movement to Interview Island and North Reef Island which are wild life sanctuaries is minimal because of connectivity to middle Andaman. At a micro level most of the settlements have pucca road of 3 kms stretch except Tugapur which has 7 kms of length. The secondary network of roads has not developed to establish easy and faster connectivity. While connectivity by bus and road transport is adequate, accessibility by boat is highly restricted. All these point to the fact that physical development in and around Mayabunder is likely to be limited in the immediate future.

4.1.4 UNTAPPED ENDOWMENT OF RESOURCES: Marine resources and exploitation of the fishing catch especially with the unique variety of 'Aiyara', in the existing fish landing jetty is limited. It is to be borne in mind that the fisheries department and the State Development Report 2006 have observed, hardly 12% of the estimated potential in fishing industry is harnessed. The by passing of Mayabunder by shipping vessels from Kolkatta on their way to Port Blair has contributed to decline of tertiary sector of employment and mobility of tourists. Fortunately with as much as 37% of lands (1458 hectares) under agriculture in the surrounding region, the resource can be tapped. Mayabunder environs with limited urbanisable land along with restrictions brought by sea, hilly terrain and reserved forests needs to go for agricultural revolution in the surrounding region both in terms of mechanization and encouraging to certain extent high value, low volume crops. This will further enhance Mayabunder region as a centre of food production and a granary for grains and vegetables. Similarly this region with as much as 27.5% of lands (1085.25 hectares) under forest needs consideration to convert the natural asset for economic benefits. With the sanction of forest department plywood and timber industries can be integrated for economic sustenance. Except Mayabunder all the eight settlements have substantial extent of land under hilly terrain. The soil condition needs to be tested and converted as an economic asset either by cultivation or as a building material.

4.1.5 AVAILABILITY OF INFRASTRUCTURE: The proposed planning area of Mayabunder enjoys basic education facilities as evidenced from the high literacy rate of 72.7%. Within the proposed planning area there are two senior secondary schools and six middle schools. The Gender Disparity Index has improved to 0.876 in 2001 in the Mayabunder Tehsil, indicating attainment of women in overall human development as per the Statistical Handbook 2005-2006 for ANI. The public hearing

demonstrated this and there appears to be a demand for higher education facilities for the Tehsil area in sectors like arts, science, engineering, forestry and marine biology with reservations for women. Basic medical facilities are available in Mayabunder region. There is one main hospital (30 beds) and three sub centres within the proposed region along with three veterinary sub centres. Communication facilities in the form of post office are provided by one at Mayabunder and one branch office at Pahalgaon. Piped water supply and Electricity are available within the proposed planning area. In the case of tourist infrastructure, accommodation at reasonable rates and good inter modal transport facilities are necessities for improving economy. Except for the government guest house at Mayabunder and rest houses at Kalighat and Kishorinagar nearby accommodation facilities are rare. This itself is an inhibiting factor for tourists to stay. Boarding and hospitality sector is also not very promising. All the tourist's attractions in terms of beaches, wild life, flora and fauna do not call for elongated stay. This may call for innovative tourism attraction for extended stay to capitalize on tourism industry.

4.1.6 POOR QUALITY OF PUBLIC SECTOR HOUSING STOCK: Physical and visual survey of Mayabunder revealed number of tenemental housing stock with indigenous architectural style in the government sector, in poor state of maintenance, negligence becoming an economic liability. Some of them could be rehabilitated and most of them had to be re developed. It is also observed that the fisherman colony on the sea shore had turned out to be a 'coarse grain' in the environment and needs to be rehabilitated not only for well being of fisherman families but also retrieve the beach towards 'fine grain' which is environmentally sensitive.

4.1.7 ENVIRONMENTAL: As mentioned already environmental degradation is observed on the sea shore through residential wastes and garbage's thrown by the limited number of tourists. "Clean Sea and Clean City" programme is a must. Environmentally sensitive programmes are required for Mayabunder environs. The observations during the public hearing about prevalence of habitations deep into reserved forest need serious consideration. Encroachments in all forms require serious consideration and rehabilitation needs to be considered for environmental protection.

5.1 POPULATION FORECASTING

5.1.1 The physical strategies for the Master Plan needs to be conceived over time and space which has a direct bearing on the population at the end of the plan period. This is followed by the space requirement and land use allocation to solve the issues identified earlier. This Master Plan period is 2009 to 2029, and the estimated population for the plan period is arrived on the basis of growth trends and assumptions over the consequences of the planned development for the future. The population and its growth in Mayabunder and the revenue villages proposed for inclusion in the planning area are shown in Table No. 3.

Table No. 3 Population and its Growth

Sl.No	Name of the settlement	Population in 2001	Growth Rate % per annum (1991 – 2001)
1	Mayabunder	3182	2.53
2	Other Revenue villages in the Proposed Planning area	9248	3.55
3	Mayabunder Planning Area	12430	3.46

Source: Census of India – 2001, 1991

It is seen from the above table that the annual population growth of the region during 1991 – 2001 is 3.46%. It is also observed that there is a declining growth rate for the AN Islands which is attributed to the public policies that prevail in the islands and limitations of the islands in terms of connectivity to the main land. Mayabunder suffers this disadvantage even more. However with the kind of sustainable development policies and programmes for a stable economy for the plan period ending 2029, it is reasonable to assume that the growth rate will not further get reduced and will be of the order of 2.5% to 3.5%. On the basis of this assumption, the projected population for 2029 is estimated based on different methods. These projections are indicated in Table No. 4.

Table No. 4 Population Projections for Proposed Mayabunder Planning Area

S.NO	METHOD	YEARS		
		2011	**2021**	**2029**
1	Arithmetic Progression	16154	19879	22859
2	Geometric Progression	16926	23756	31858
3	Incremental Increase	15452	18474	20892
4	Linear Progression	16926	23756	31858

Thus it is projected that the population of Mayabunder Planning Region will range from 0.21 lakhs to 0.32 lakhs. The land use requirements and allocation have to be worked out for highest estimate of 0.32 lakhs.

6.1 DEVELOPMENT STRATEGY

6.1.1 Population forecasts for the proposed Mayabunder Planning Area is estimated to be 0.32 lakhs by the end of 2029. Mayabunder village with a population of 3182 (as per 2001 census) has already reached a density of 84 pph and further intensification of development and containment of population is to be discouraged. The remaining villages with the present population of 8918 (as per 2001 census) have to absorb the anticipated increase and get distributed in the eight villages. Approximately 20000 population will get distributed in the remaining ten villages taking into consideration availability of urbanisable and vacant lands and community facilities and proximity factor.

6.1.2 Development issues discussed earlier on various aspects like topography, accessibility, infrastructure, housing and environment lead to the following observations:

- Mayabunder by virtue of its form and size, surrounding seas located in Seismic Zone-V, vulnerability from sea and limited availability of land for future development cannot continue to be the Administrative “Hub” and such functions needs to be phased out.

- There is a need to identify a settlement at a strategic location to serve as an administrative and institutional hub.

- Towards making Mayabunder sustainable in terms of economic development and provide for employment opportunities, industrial activities based on forest and fishing has to be considered, at preferred locations.

- Though commercial activity is observed in the main streets with heterogeneous mix up of related land uses, for future requirement such activity needs to be regulated and provided for such commercial activity. It may also take care of the tourism sector.

- Since more than 20000 population are to be provided with housing, there is a need to identify more than 22 hectares of additional land (assuming a density of 90 persons/hectare) within the proposed planning area. Availability of land is very much restricted and they could be spread out in more than one location. Mayabunder, Pokadera, Lucknow, Devpur and Tugapur are the five settlements which have vacant lands for development. The linear form of Pokadera with fish landing jetty and coastal stretch is not conducive for mass housing and hence other four settlements may be considered.

- Water supply in the region is acute and a more stable solution to tap underground as well as on ground water is to be contemplated. Webi and Tugapur settlements which have 31.5 hectares and 57.9 hectares of land spread in water could possibly be tapped to solve the problem. These two settlements could also support marginal back waters tourism activities.

- The region with as low as 0.1% of land (2.76 hectares) under industries, requires promotion of forest and fishing industries for economic sustenance and as such areas are to be identified for the same.

6.1.3 The strategy discussed here along with observation will provide a basis for development concept for the proposed Mayabunder Planning Area.

7.1 DEVELOPMENT CONCEPT

7.1.1 Mayabunder has the smallest population compared to other settlements like Diglipur and Rangat but commands the largest Tehsil area of 1348 sq.km. This peculiarity is because of lands under reserved forests in the Tehsil. The development spread is unplanned and heterogeneous as seen in the main commercial street. However urban architecture and form is more legible because of large scale developments under public sector.

7.1.2 While Mayabunder is fully urbanized in terms of land use, the adjoining settlements of Lucknow, Pokhadera and Tugapur show less urbanisable land and more vacant lands offering scope for expansion. The density of development can be limited in Mayabunder and it could develop to accommodate tourism facilities. Any spill over of development could be regulated in the three settlements mentioned above. Considering the contiguous settlements, topography, street network and population spread it is seen that Mayabunder region is a typical example of RIBBON DEVELOPMENT, with ANDAMAN TRUNK ROAD as the LIFE LINE. With 3.46 percent growth rate between 1991 and 2001 in Mayabunder Planning Area the projected population is roughly 0.32 lakhs. While this by itself is not a challenging issue, the floating tourist population with an annual growth rate of 6.4 % per annum, for the island supported with positive steps taken by tourism department may throw certain challenges in terms of tourist accommodation and development of hospitality sector.

7.1.3 All these call for a concept that is realistic to take care of all advantages of ribbon development and reduce or avoid all disadvantages of ribbon development. Accepting this ribbon development as an inevitable factor, the future development can be regulated by a corridor identified for specific developmental activities which will "absorb" the future demand both in terms of population and infra structure. Conceptually these could be the **"hubs"** along the corridor. The concept of "Urban Corridor" along the ATR will take care of all planning issues in the next twenty years.

7.1.4 ADMINISTRATIVE - INSTITUTIONAL HUB: While it was mentioned that Mayabunder has the disadvantage of being cut off during times of natural disasters, it is logical to shift administrative functions to a safe and vantage zone. With the declaration Mayabunder as a sub division and it will have to accommodate more

administrative function, buildings and infrastructure. For this purpose "Lucknow" 4 kms from Mayabunder is considered ideal. First it is at the junction, where ATR takes a diversion to Diglipur across Austin Bridge. From here the road traverses as a cul-de-sac to Mayabunder. Secondly it has a rising topography on the South East where forest lands begin. Hence Lucknow is proposed as an administrative and institutional "HUB". All the existing administrative function in Mayabunder has to be slowly phased out and shifted. A massive "Adaptive Reuse" programme of government buildings could be contemplated to accommodate some of the tourism facilities, within Mayabunder in safe zones.

7.1.5 COMMERCIAL HUB: Next to Mayabunder, Pahalgaon (population – 1326) has an appreciable extent of land (0.86 hectare) under commercial area, perhaps because of its proximity to Tugapur, the location between forest lands and long stretch of ATR within it. Next to Mayabunder it can absorb more commercial activities not only of the region but also for the likely tourism demand.

7.1.6 RESIDENTIAL HUB: It was already mentioned that the dilapidated public sector housing stock both in Mayabunder as well the surrounding region call for rehabilitation programme. However the future growth of population needs to be absorbed beyond Mayabunder which is saturated."Pahalgaon" has 638 hectares of vacant and other lands apart from water bodies and forest which could possibly absorb all the future residential development along with commercial activities as mentioned in 7.1.5. The presence of ATR could be taken advantageously to link residential areas. Similarly Tugapur with 42 hectares of vacant and other lands could also absorb additional residential developments.

7.1.7 TOURISM HUB: Tugapur located at a distance of 16 kms and Webi located at a distance of 8 kms from Mayabunder are characteristic in terms of water bodies and parcels of urbanisable lands. Tugapur with an extent of 57.91 hectares and Webi with an extent of 31.60 hectares under water bodies with prominent estuaries lend themselves for back water tourism. Karmatang at a distance of 15 kms from Mayabunder has characteristic beaches, which needs to be linked by a drive way to attract tourists. This could absorb sea – based tourism activities. Thus TUGAPUR WEBI AND KARMATANG will be identified as "TOURISM HUB" to enhance and absorb any tourism related activities. In addition Mayabunder needs to be discouraged

in terms of administration function. It has the advantage of potential tourism activities. Hence safe zones can be identified to absorb tourism activities.

7.1.8 INDUSTRIAL HUB: Development issues point out that tourism; agriculture and industry are the three major sectors which need to be concentrated for economic sustenance of this region. Hence it is necessary to "exploit" both forestry and fisheries activities to be absorbed in the proposed "Industrial Hub". Mayabunder and environs have minimal industrial land use and activity. Towards economic sustenance exploiting fishing industry, in terms of fish landing jetty's, provision for sea food processing, cold storage and marketing facilities are required. Simultaneously timber and plywood industries and traditional wood crafts to attract tourists are to be planned. Since Lucknow is identified as an administrative hub, Lataw at the function of ATR for forestry and Pokhadera for fishing industries respectively could serve as industrial hubs.

7.1.9 TRANSPORT NETWORK: As mentioned earlier inter island connectivity from rest of the islands and safe and faster connectivity in the region of Mayabunder is an issue. The helipad which is used for administration purpose and occasionally by civilians needs a strategy for its optimal use. The existing boat jetty in Mayabunder requires up gradation in terms of future tourist population. An "express driveway" to Karmatang from Mayabunder by upgrading the present may serve as a tourist attraction. The connectivity between helipad, boat jetty and a new bus terminal needs serious consideration.

7.1.10 The development concept as shown in Map No. 3, focusing on regulated corridor development and identified functional hubs will form the basis for preparation of the Draft Master Plan.

MASTER PLAN FOR MAYABUNDER

Map No. 3 Concept Plan