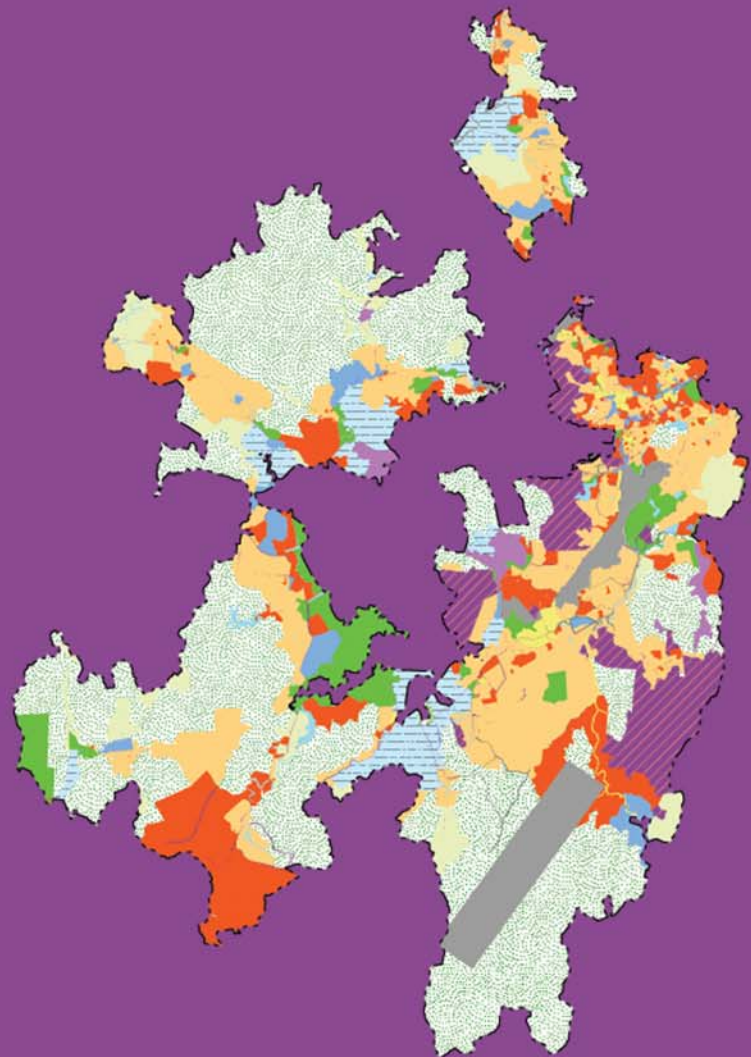




DRAFT MASTER PLAN FOR PORTBLAIR PLANNING AREA - 2028



TOWN PLANNING UNIT
ANDAMAN PUBLIC WORKS DEPARTMENT

VOLUME I
THE STUDY



MASTER PLAN FOR PORT BLAIR PLANNING AREA – 2028

Draft Report

January 2009

VOLUME I

THE STUDY

Town Planning Unit

Andaman Public Works Department

FOREWORD

Emerald islands more popularly known as Andaman and Nicobar Islands on the eastern side of India has a history dating back to 2nd century A.D., as a land of primitive tribes. The islands played a major role during the colonial periods of Indian history. What started as a penal settlement before India's independence, these islands witnessed urbanization with tribes, islanders, patriots and settlers from the mainland. The earliest and fastest growing settlement in these islands PORT BLAIR, named after the British Colonel, serves as the catalyst for the growth of the islands. Port Blair with a population of 99,984 (as of 2001) and extending over an area of 17.74 sq.km., has exhibited signs of haphazard development along with problems of urbanization. The emergence of Port Blair and the surrounding islands as a tourist spot, coupled with all issues and challenges of the ecologically fragile environment throws many challenges for future development.

Several planning efforts had been undertaken in the past in guiding the future development. The Outline Development Plan for Port Blair prepared by the Town and Country Planning Organisation, New Delhi in 1994, State Development Report prepared by National Institute of Public Finance and Policy in 2004, Andaman Islands Coastal Area Assessment Report by Equations, Ecological Sensitive Architecture Report by Expert Committee constituted by Ministry of Urban Development, Government of India, and Sustainable Development of Tsunami Affected Areas Report by School of Planning and Architecture, New Delhi have all studied the problems and potentials of the ANI and Port Blair. They have brought out the issues confronting the development and have suggested several recommendations.

Realizing the complexity and interrelationships of the issues concerning development, and the need to have an integrated approach towards sustainable urban development, the Town Planning Unit of the Andaman Public Works Department (APWD) has taken the lead in preparation of a Master Plan for Port Blair and its environs under Section 6, Chapter III of the Andaman and Nicobar Islands Town and Country Planning Regulations 1994. The School of Architecture and Planning, Anna University Chennai was entrusted with the task in the year 2006.

To evolve a most appropriate physical development strategy with the aim of developing Port Blair and its environs into a self sustaining entity, the consultancy team studied the development issues, their causes and consequences. The conceptual proposals were presented to the Coordination (Integration) Committee and the Advisory Council during May 2007, which were widely accepted. Thereafter, detailed field investigations were carried out and sectoral analysis were made in order to detail the conceptual proposals. To translate these into realities, an effective zoning and land use plan is conceived with appropriate development regulations. These were also presented to the Coordination (Integration) Committee and the Advisory Council in April 2008. The suggestions of the committee have been incorporated in this report and the same is submitted for inviting objections and suggestions from any person and to every local authority to make representations or suggestions as per Section 7 (1) and (2) of Chapter III of Andaman and Nicobar Islands (Municipal) Regulations 1994. After duly considering all objections, suggestions and representations received the final Master Plan will be prepared and submitted to the Administrator of ANI.

It is hoped that the proposals envisaged as part of this draft report which is presented in two volumes (volume I containing the study part and the volume II containing the development proposals) would meet the aspirations of the people and enable Port Blair to achieve sustainable growth taking into account, the fragile ecology of the region.

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ABBREVIATIONS

AMD	--	Andaman Marine Drive
ANI	--	Andaman and Nicobar Islands
APWD	--	Andaman Public Works Department
ATR	--	Andaman Trunk Road
B.O.D.	--	Biological Oxygen Demand
C	--	Commercial
CAA	--	Constitutional Amendment Acts
CBA	--	Continuous Building Area
CZM	--	Coastal Zoning Management
CRZ	--	Coastal Regulation Zone
DC	--	Defence and Cantonment
ECCE	--	Early Childhood Care and Education
EIL	--	Engineers India Limited
EWS	--	Economically Weaker Section
FAR	--	Floor Area Ratio
FAST	--	Foundation for Aviation and Sustainable Tourism
GDI	--	Gender Disparity Index
HDI	--	Human Development Index
HPI	--	Human Poverty Index
HTL	--	High Tide Line
I	--	Industrial
IED	--	Integrated Education for Disabled
JNNURM	--	Jawaharlal Nehru National Urban Renewal Mission
MES	--	Military Engineering Services
MR	--	Mixed Residential

NEERI	--	National Environmental Engineering Research Institute
NIOT	--	National Institute of Ocean Technology
ODP	--	Outline Development Plan
PBPA	--	Port Blair Planning Area
PBMC	--	Port Blair Municipal Corporation
POS	--	Parks and Open Spaces
PR	--	Primary Residential
PSP	--	Public and Semi Public
SR	--	Special Reservation
SWOT	--	Strength, Weakness, Opportunities and Threats
TC	--	Transportation and Communication
UDPFI	--	Urban Development Plan Formulation & Implementation
UNDP	--	United Nations Development Programme
WAPCOS	--	Water and Power Consultancy Services (India) Limited

1

THE PAST & THE PRESENT

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THE PAST & THE PRESENT

1.1 EVOLUTION OF SETTLEMENT

1.1.0 Bay Islands more popularly known as Andaman and Nicobar Islands (ANI) are the large land forms though there are lesser known islands and islets named after persons who spotted them, visited them, managed them or colonized them. The primitive inhabitants of the Andaman and Nicobar Islands have been partly nomadic and lived by hunting and fishing. Anthropological studies reveal there are four Negrito tribes viz., the Great Andamanese, the Orige, the Jarawas and the Sentinelese, in Andaman group of islands and the Nicobarese and Shampen, the two Mangoloid tribes in the Nicobar group of islands. There are reports of the Chinese and the Malay pirates visiting these islands in their canoes to capture these natives for their slave trade. Yet the Aborigines undisputedly occupied these islands for countless generations, though several people from outside attempted to colonise these Islands.

1.1.1 The history of the islands could be broadly divided into the following distinct periods; i) 2nd Century A.D to 16th Century AD : Stray incidents of Warfare, Slavery, bonded labour and looting ii) 1789 A.D : Establishment of settlement at Port Blair iii) 1792 A.D Shifting of the settlement to North 1796 A.D, its closure iv) 1796 and 1858 A.D : Incidents of ship-wrecks v) 1858 A.D : Setting up of the penal settlement at Port Blair vi) Japanese occupation of these islands and advent of Netaji Subash Chandra Bose vii) Earthquake in the Ross Island in the year 1941 which made the Japanese to flee from the islands, and viii) Post Independence period with developmental activities.

1.1.2 Vinayak Damodar Savarkar, great Indian freedom fighter opined that the name Andaman is derived because of their egg shaped appearance (Anda means egg in most Indian languages). Some historians say that the name Andaman relate to the Ramayana hero Hanuman while some pirates thought that Hanuman came from these islands, which in course of time became Andaman. The East India Company planted its roots in the mainland and felt the necessity of a safe harbour on the east of Coramandel Coast. Lord Cornwallis, the then Governor General of the East India Company, commissioned Lieutenant Archibald Blair in December 1785 who sighted port Cornwallis, now called as Port Blair. In 1789, it was decided to develop the settlements in the Andaman Islands, thus the regions surrounding Port Blair started developing.

1.1.3 With the end of British Raj in India in 1947, these islands became an integral part of India. Even before India could obtain full Independence the last British Chief Commissioner W.K. Patterson had handed over charge to Inam-ul-Majid, an Indian officer of the Indian Civil Service, who is credited for having launched the co-operative movement. The co-operative societies or the Panay-Hanay for the local people are great

social move. Swayed by communal feelings he planned to immigrate nearly 600 Muslim families from East Bengal for permanent settlement here for which reason he was transferred and replaced by A.K. Gosh of the Indian Civil Service. He formed an Advisory council for him, resettled 2000 Bengali refugees, strengthened the Bush police and successfully conducted an expedition to have contact with Shompens, a hostile tribal group and above all realizing the low sex ratio encouraged mixed marriages, resulting in the development of a very heterogeneous society.

1.1.4 A.K. Gosh was replaced by S.N. Moitra another I.C.S. officer, who could be the first person to have concentrated on the physical development of Port-Blair. Besides beautifying the City of Port Blair, he was responsible for carrying out the projects started in the First Five Year Plan. He constructed roads, introduced inter-island ship traffic, inaugurated the first bus service and also introduced mobile health services to different inhabited islands with a “Ship Hospital”. He planned the visit of Dr. Rajendra Prasad, the first President of Republic India. He brought Port Blair and the island on the wheels of a major socio-economic reform making the island an inseparable part of Indian union.

1.1.5 The Municipal Board Regulations for Port Blair came into effect on 18th June 1957. The opening up of Air-Traffic between Calcutta and Port-Blair in 1963 and the starting of the All India Radio Station, the same year are remarkable achievements. Under the State Re-Organization Plan, the Andaman and Nicobar Island was accorded the status of a Union Territory, with effect from 1st November, 1966.

1.2 ADMINISTRATION AND GOVERNANCE

1.2.1 The history of administration of the islands starts with of Lt. Colonel, Lokanathan, being appointed as the Chief Commissioner by Netaji representing as the Chief of Provisional Government of free India. The Union Territory of Andaman and Nicobar islands, after India’s political freedom, was awarded the status of part-D state. For administration purposes the Union Territory has been divided into two Districts i.e. the District of Andaman and District of Nicobar. Andaman District has been divided into five tehsils while Nicobar into two tehsils. The sub division of the islands and the tehsils under each of them are indicated in Table 1.2.1.

Table No. 1.2.1 ANI - Administrative Districts, Sub-Divisions & Tehsils

DISTRICT	SUB-DIVISION	TEHSILS	AREA (IN SQ.KM)
Andaman	Mayabunder	Diglipur	884
		Mayabunder	1348
		Rangat	1098
	South Andaman	Port Blair	145
		Ferrargunj	2992
Nicobar	Car Nicobar	Car Nicobar	129
	Nancowry	Nancowry	1824

1.2.2 The Union Territory is a separate parliamentary constituency to look after developmental activities and assist in the administration. The Lieutenant Governor is the Chairman-cum-Administrator of the Pradesh Council. The Member of the Parliament and Chairman of the Port Blair Municipal Board are its ex-officio members. There are 26 more members on the Council of which four Councillors are elected to assist the Civil Administration. There are five Community Development Blocks in the Andaman and Nicobar islands other than Port Blair, which is the only urban settlement. The villages in the islands are served by 44 Nyaya Panchayats, which dispense justice to the people. The Port Blair Municipality has been divided into eleven wards for administrative purposes. The Municipal Board for the town of Port Blair consists of Chairman, Senior Vice-Chairman, Junior Vice-Chairman, eight elected members and four nominated members.

1.3 PHYSICAL FEATURES AND CLIMATE

1.3.1 Andaman and Nicobar islands of the Indian Ocean is situated between Irrawady Head in Burma and the Achin Head of Sumatra. Significantly the islands lie on the borders of the Eurasian Plate and Indo-Australian Plate which of late have shown signs of movement. The Andaman group of 325 islands on the north and the Nicobar group of 24 islands on the south (total 349 islands) are separated by the Ten Degree channel. These islands are bounded by the 10⁰N and 14⁰N latitudes as well as 92⁰E and 95⁰E longitudes. The North Andaman, the Middle Andaman, the South Andaman and the little Andaman are the major significant islands of the group. The Andaman Islands stretches approximately for 464 km. in length between North and South with an average width of 24 km. in the East - West direction. Map No. 1 and 2 indicate the location of island with mainland and Port Blair in Andaman and Nicobar islands.

1.3.2 These islands also lie within the seismic zone of South East Asia (Earthquake belt) and they have been experiencing earth tremors at frequent intervals. As per the India Meteorological Department the islands are covered under Zone V, which is seismically most active region where earthquakes of magnitude 8 or more could occur. The earthquake that occurred on 31st December 1881 is the worst in the history. The TSUNAMI that struck the island in December 2004 left a major scar in the history of the island.

1.3.3 Geologically the islands are composed of thick Eocene deposits, sedimented on Pre-Tertiary Sandstones, Shales and Lime Stones. In these, sedimentary rocks have intruded basic and ultra basic rocks. Calcareous sandstones and sand rocks occur frequently interspersed with Intercalate clays and conglomerates. The intercalated clays are susceptible for erosion and give birth to serrated ridges in this region. Soils are original on the hill tops and ranges whereas along the sea-coast and valleys transported soils are found. The sandy soil along the coast consists of Shingles and Corals. Lower slopes of valleys have Clayey Loams. The soils vary from heavy clays to clay-loams, gravely loams, and sandy loams. These soils have low moisture retention capacity. Humus, an organic matter is lacking even in forest areas. With regard to minerals the surveys so far conducted reveals that the region has no deposits.

1.3.4 Andaman islands in general and Port Blair in particular is located south of Tropic of Cancer and the region is surrounded by warm seas. The climate of this region is classified as Warm and Humid. The temperature is in the range of 25^oC to 30.5^oC. The high temperature along with high relative humidity gives rise to high perceptible temperature and sultry weather. But this type of weather is tempered with pleasant sea breezes. Relative humidity is high throughout the year reaching maximum of 79 % during the North West monsoons. The maximum temperature recorded at Port Blair is 32^oC. The average annual rainfall is around 300 to 350 cm. Rainfall is received both from the South-West and North-East monsoon. May and June are the rainiest months and April is the warmest month in this region. It is observed that it is only the South-West monsoon that brings in most of the rainfall. During May-June, onset of the monsoon and in September-October withdrawal of monsoon is observed. The North East monsoons beginning in November continue till the end of February. March is observed to be the driest of the months. This transitional period is nonetheless disturbed by cyclonic storms which may be accompanied by thunder showers. Most of the storms experienced by the mainland and this region around Port Blair originate in Bay of Bengal. Occasionally storms originating in China Sea reach these parts of the islands and have some impact.

The water drains out rapidly because of steep slopes and sandy as well as loamy soils. Resultantly fresh water supply is scarce. South Andaman particularly has Ghats on the

east and west. During dry season the streams either do not have any water or only a trickle of water. However, the streams in the South Andaman where Port Blair is located are somewhat perennial because of continuous and heavy rainfall.

1.3.5 With an average temperature of 28⁰C and an exceptionally high rainfall around 350 cm. and active monsoon disturbances these islands are naturally covered with evergreen forests. The evergreen forests cover nearly 78% of the total areas of these islands excluding urbanised areas like Port Blair, Diglipur and Mayabunder. Along the coasts, vegetation is of mangrove type. Along the valleys typical tropical evergreen forests are present with scrub forests on the summits. Hardwood, Cane wood, Plywood, Matchwood, Cane and Resins are valuable gifts of Andaman forests with occasional occurrence of Glades and Bamboos. Andaman is called as “gold mine of timber”. Padak, Kukku, Chulgam, Marble wood, Satin wood, Pynma, Bombway, Choei, Lalchim, Pongyet, Thitmin, Mouha, Khaya, Gangraw, Didu and Gurjan are some of the principal timber wealth in the forests of Andaman. Padak is the best known timber for its variety of colours and grains and is not found anywhere in India. The fauna and the animal life in South Andaman include Elephants, King Cobra, Indian Cobra, Black Woodpecker, Lion tailed Monkeys, water Lizard, estuarian crocodile, Green Sea Turtle and Andaman Island Snake to mention a few.

1.3.6 The town of Port Blair, the administrative head quarters of the Union Territory of the Andaman and Nicobar Islands, is situated at the South East coast of South Andaman at a distance of 1248 km. from Kolkata, 1184 km. from Chennai and 570 km. from Rangoon. Port Blair, is characterized by undulating and rolling topography compared to relatively large valleys as seen in Diglipur and Betampur region in the north. Erosion has played no less role in producing ruggedness of relief. Changes in sea level are observed in some places.

1.4 DEMOGRAPHIC CHARACTERISTICS

1.4.1 Andaman Islands remained abode of Aborigines, and the Negritoes in seclusion, until the end of 16th century. At the end of the 18th century and with the formation of penal settlement in 1858 there began an influx of people, mainly from different parts of the Indian mainland, East Pakistan (Bangladesh) and Burma (Myanmar). After independence refugees from East Bengal and South India started settling here. From planning and demographic point of view the people can broadly be classified as: 1) The Aboriginal Population, 2) the Refugees, 3) the Early Settlers and 4) the New Settlers. These people in the island and Port Blair indicated here reveal the complex culture of this society.

1.4.2 Port Blair town shows an upward growth trend from the year 1951 onwards. The population of Port Blair was 49,634 in 1981 with decennial growth rate of 89%. In 2001, the population increased to 99,984 due to developments in trade and commerce, construction activities by various governmental organizations and increased tourism activities. The present population of Port Blair town is estimated at 1,23,504. While population of the island shows an increase, the decennial growth rate of both Andaman district and Port Blair shows a decline. The population growth trend at the district and town level was 105% and 80% in 1961 and mere 27% and 33% in 2001. The growth trend of the town in comparison with the district shows a steep increased trend till 1961 (due to thrust in trade and commerce) and thereafter declined to 33% in 2001 due to out-migration outside Port Blair and to mainland.

1.4.3. Compared to National density of population of 221 persons per Sq. km, the UT of Andaman and Nicobar Island has only 23 persons per sq.km. The density was 4 persons per sq. km in 1951, 8 persons per sq. km in 1961, 14 persons per sq. km in 1971, 23 persons per sq. km in 1981, and 43 persons per sq. km in 2001.

Table No. 1.4.3 Population, Sex Distribution and Density in Port Blair

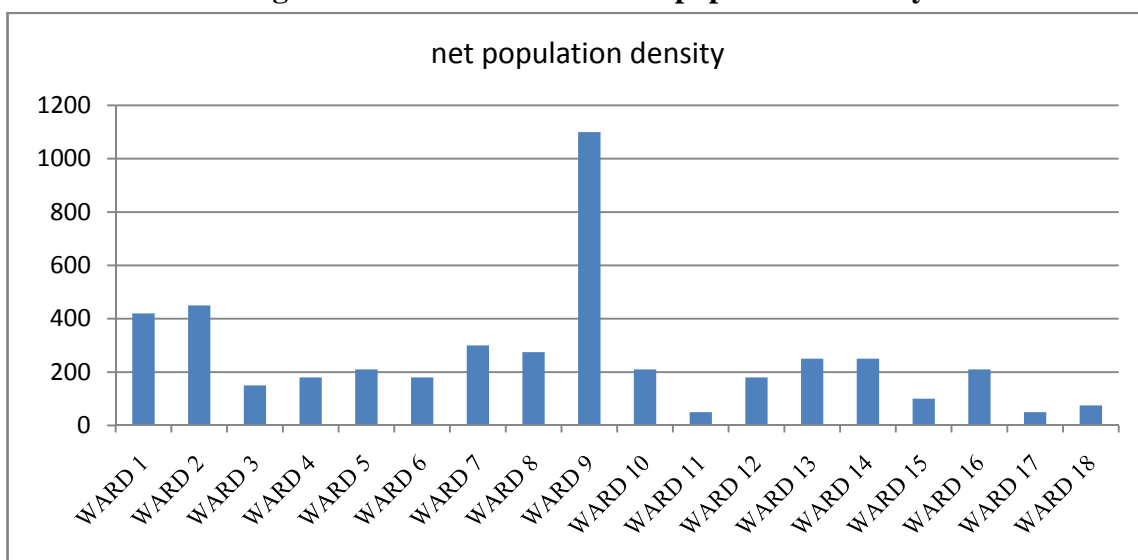
WARD NUMBER	POPULATION - 1991			POPULATION - 2001			GROSS DENSITY (PPH) 2001
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	
1	4701	3812	8513	2926	2445	5371	103
2	2763	1942	4705	4890	3367	8257	258
3	3635	2890	6525	3482	2933	6415	50
4	5336	4364	9700	3811	3324	7135	125
5	3564	2757	6321	2533	2129	4662	72
6	958	629	1587	2433	2038	4471	60
7	1824	1115	2939	3278	2727	6005	200
8	3715	3041	6756	2656	2285	4941	137
9	6672	4783	11455	2984	2564	5548	97
10	1791	1325	3116	5185	4232	9417	59
11	7424	5914	13338	2856	2339	5195	22
12	---	---	---	2613	2117	4730	75
13	---	---	---	2342	1820	4162	149
14	---	---	---	2693	1997	4690	66
15	---	---	---	1953	1700	3653	34
16	---	---	---	2435	1724	4159	88
17	---	---	---	3444	2680	6124	24
18	---	---	---	2859	2190	5049	19
Total	42383	32572	74955	55373	44611	99984	56

The density of Port Blair town was 52 PPH in 1991 and 56 PPH in 2001. The density has not shown appreciable increase during 1991-2001 in view of increase in the town area from 14.41 sq.km to 17.74 sq.km. The number of wards has also risen from 11 to 18 during this period. A comparative statement of ward wise distribution of population in 1991 and 2001 is shown Table 1.4.3.

1.4.4. The distribution of population at ward level indicates that the population is highest at the northern portion of the town in areas like Aberdeen, Haddo, which constitute the oldest parts of the town. After 2001, it is observed that parts of south adjoining Garacharma, Brickgunj and Dollygunj show higher densities. The gross density pattern of wards range between 258 PPH (ward no: 2) to as low as 19 PPH in outlying areas (ward no.18) and it is also seen from the table 1.4.3, that more than 12 of the 18 wards register less than 100 PPH. Variations in density can be attributed to the fact that in many of the wards sizable extent of lands are under defence or Airport Authority of India and also the unsuitable terrain.

1.4.5 The net density pattern which includes residential areas alone again varies like gross density. In most of the wards it is seen that Gross density is directly correlated to the net density, except in ward no.9, where nearly two third of the ward area is observed to be under defence lands and the net density is as high as 1109 PPH due to number of defence quarters. Needless to say that these defence areas has number of residential buildings. Out of the remaining 17 wards except for five i.e., wards 3, 11, 15, 17, and 18 all others have already reached a net density of 200 PPH. Even these five wards indicate that they comprise of agriculture and forest lands. Analysis reveals that densities are high and seen growing along the major roads in the same direction of urban expansion in south towards Garacharma, Dollygunj areas. Secondly, it is also observed that non-availability of land for development poses constraint for future development of the town. Figure 1.4.5 Shows the net population density in Port Blair.

Figure No. 1.4.5 Ward wise net population density



1.4.6 Sex ratio of Andaman Islands is reported to be 846 which is low compared to the mainland figure of 933. The Port Blair has recorded a sex ratio of 806 in the year 2001. The sex ratio is higher in the town of Port Blair because of large number of male workers who have migrated in single from the main land for better job opportunity. However at the same time those government employees who have come and settled with their families have been responsible for a gradual increase in sex ratio over time as indicated in Table 1.4.6.

Table No. 1.4.6 Changing Sex Ratio in Port Blair

YEAR	1971	1981	1991	2001
SEX RATIO	560	708	781	806

1.5 SOCIO-CULTURAL FACTORS AND ECONOMIC STRUCTURE

1.5.1 Since independence major changes have occurred with the consistent implementation of Five year plans by the Government of India. With the thrust on education and tribal welfare programmes, the community has become more literate and economic generation through specific occupations to support modern way of life is noticed. In today's context Port Blair accounts for high literacy rate compared to the Union Territory's level. The literacy rate of Port Blair has increased from 69% in 1991 to 77% in 2001. As per census 2001, 81% of the males are literate while female literacy rate stands at 72%. Port Blair town and surrounding region indicate high literacy rate because of its administrative importance and accounts for large number of government employees. In Port Blair, wards 2, 3, 4, 10 and 17 account for higher literate population compared to other wards.

1.5.2 Socio culturally, the population of Port Blair and the surrounding regions presents a heterogeneous mix. The Hindus dominate with 64% followed by Christians 24%, Muslims 8%, and the rest from other religions. People from all parts of the mainland are seen here and hence Port Blair is generally known as miniature India. Leaving the six dialects of the Nicobarese mentioned earlier, on date there are about thirty language groups amongst the population of Port Blair. The main groups are Hindi, Bengali, Malayalam, Tamil, Telugu and Nicobarese.

1.5.3 Occupational structure of Port Blair and the surrounding regions reveals that in the beginning, economy of the island was mainly dependent on agriculture, fishing and timber based small scale industries. In Port Blair, 60% of the workforce is employed in the tertiary sector and most of them are placed in the government sector. Agriculture in the island and specifically South Andaman is dependent entirely on rainfall and the scope of irrigation is limited. However the State Development Report for Andaman and Nicobar

Islands 2006 suggests that there is still scope for medicinal plant growing, cultivation of spices and coconut, improvements in horticultural products and flora and fauna of ethnic communities. Early settlers have developed paddy farms in South Andaman. Other important crops are coconut, fruit, condiments and spices. Occupational structure of total workers distribution as per 2001 census shows an alarming percentage of 63% as non-workers, 36% as main workers and 1% as marginal workers. The State Development Report – 2006 indicates a declining trend of workers productivity with 30% population below 25 years of age, and per worker value of output from 1996 to 2002. The worrisome fact is virtual stagnation of per capita income in the island. However the consoling factor is that during 2001-02 the per capita income was Rs.15,703/- which is higher than India's figure of Rs.12,203/-. Similarly the minimum wage rate in the islands has increased from Rs.27/- during 1992-03 to Rs.100/- during 2002-03. Table 1.5.3 provides the occupational structure showing the distribution of working and non-working population.

Table No. 1.5.3 Occupational Structure

CATEGORY	MALE	FEMALE	TOTAL	%
Main Workers	30,183	5,202	36,385	36
Marginal Workers	1076	280	1,356	1
Non – Workers	24,114	39,129	63,243	63
Total Population	55,373	44,611	99,984	100

1.6 SHELTER AND BUILT ENVIRONMENT

1.6.1 The town of Port Blair as a symbol of urbanization is an amalgam of various land uses catering to the various expectations and aspirations of contemporary community. The total Municipal area is 17.74 sq.km., of which only 6.45 sq.km of land is under residential use. With a population of 99,984 the gross density works out to 56 PPH and net density works out to 148 PPH in Port Blair Municipal Area.

1.6.2 Unlike the towns on the main land of India, where residential areas in a town occupy 45% to 55% of total town area, in Port Blair the residential area occupies only 36% of the town area as of 2008. This phenomenon is due to the fact that 32% percentage of land is occupied by defence, forest, agriculture, water bodies, and intricate road network within the municipal limits. Survey reveals that while wards like Aberdeen, Haddo on the north require residential areas, recently, Delanipur, Junglighat, Dairy farm and Lambaline are emerging as large residential areas on the western periphery. Since land is scarce and not readily available, encroachment on government land and forest lands are observed. Residential areas within municipal limits lack community recreational spaces and related

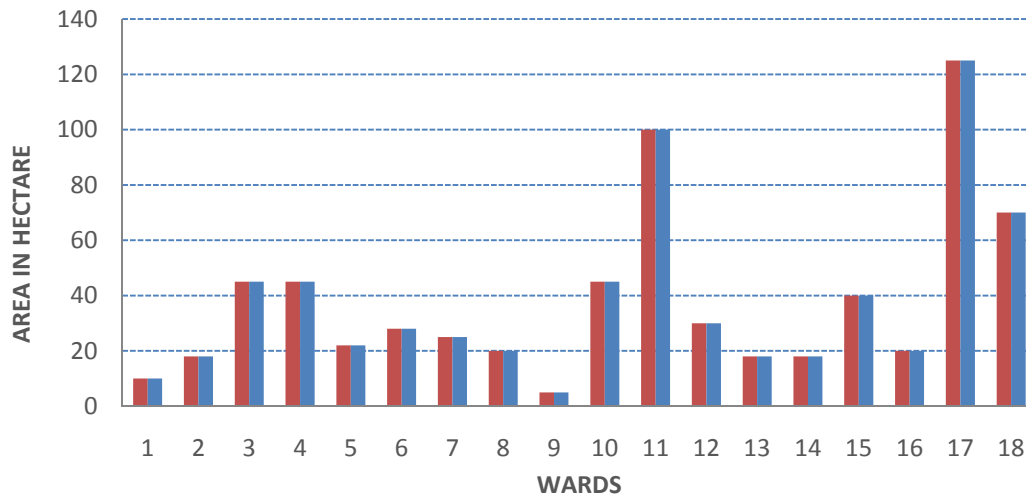
civic amenities. The least popularity of cinema theatres in Port Blair indicates that the people are satisfied with other sports and cultural facilities. Recreational area occupies only 1 % of town area which indicates the contended life style of the people. Considering the future demand and tourist a large recreational area is a necessity. Public and semi public areas occupy 9 % with a concentration of government offices and institutions. Comparative analysis from 1981 to 2006 indicates substantial growth under this zone. In the surrounding regions outside Port Blair, Bamboo flat on the North, Dollygunj, Austinabad and Garacharma on the South West account for large residential areas.

1.6.3. The household survey conducted in the year 2007, reveals that majority (i.e 78 %) of the housing in Port Blair is owned followed by 13 % under government and as such rental accommodation is not popular (9%). However in surrounding regions of Port Blair rental accommodation is available with a substantial percentage 25% to total housing stock. Most of the people in the town of Port Blair live in individual types of houses (81%) indicating a preference to such form of development and less popularity of flats or apartments which constitute 3% of total housing. At the same time, apartments are emerging in the surrounding region which is of the order of 9%. The average plot size in Port Blair and environs is around 60 sq.m with a built up area of 50 sq.m accounting for 73% of total residential accommodation. Even today the town of Port Blair indicates a preference for single storied housing which constitutes 84% of total housing and most of them remain as primary residential area.

1.6.4. Residential dwellings in Port Blair predominantly use celcrete or hollow blocks (55%) as load bearing members followed by bricks which is 20%. It is observed that in the outlying areas around Port Blair hollow blocks manufacturing industries are existing and are coming up. Timber as a partition is used in some of the houses accounting for 15% of total housing. The most popular roofing material is galvanised iron sheets which accounts for 51% because of its lightness, easy transportation cost and quick erection possibilities. Around 21% housing, especially the government housing use reinforced cement concrete as roofing material. Thatch is not popular and perhaps restricted to the tribal reserves. Continuous building as a typology is restricted to certain areas like Aberdeen, Haddo and Junglighat accounting for 14.5% of total housing.

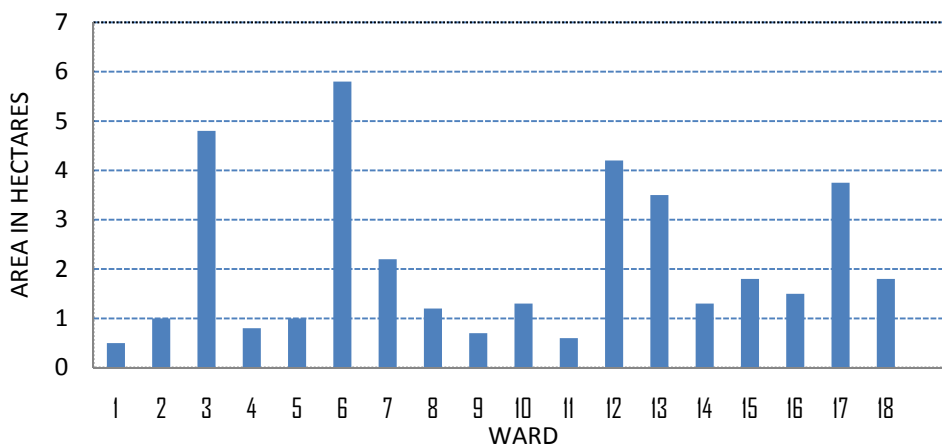
1.6.5. Figure 1.6.5 indicates the distribution of residential areas in the wards of Port Blair. It is seen that Wards 3,4,10,11,17 and 18 consisting of areas in Haddo, Junglighat, Lambaline, Nayagoan, Dudhline and School Line account for large spread of residential areas. The phenomenon is due to the presence of defence housing and apparently large extent of wards themselves.

Figure No. 1.6.5 Ward wise Distribution of Residential Areas



1.6.6. Morphological evolution of the built environment in the Island and Port Blair in particular indicate an informal, organic growth with colonial histogenesis and sporadic developments of building activities continuously. Commercial requirements of the community and people indicate a sporadic distribution, organically developed to meet the demands of the people. Unlike the towns of the mainland where it is possible to discern a central business district (a western concept) in the oldest part of the town, Port Blair remains an exception. The only “possible” commercial hub i.e. the Aberdeen market in the central area of town is characterized by mixed land uses, including residential areas. Linear, sporadic, discontinuous, strips of commercial activities are observed along most of the major roads which are wide. It is also observed that there is no distinct segregation of wholesale and retail activities. The existing commercial activities, shops and business premises have reached a stage giving little possibilities for expansion. Figure 1.6.6 gives an idea of ward-wise distribution of commercial areas in Port Blair.

Figure No. 1.6.6 Ward wise Distribution of Commercial Areas



1.6.7. From the table it is seen that ward nos. 3 (Delanipur), ward no 6, ward no 12 (Aberdeen), ward no 13 and 17 (Dudhline) have substantially more areas (more than 4 Hectares) under commercial land use which are the oldest parts of the town as well as outlying (presently developing) areas showing signs of decentralized development. It is also observed that linear strips of commercial areas in the frontage of prominent streets not only contain residential settlements behind them, which are invariably on slopes but also make the commerce and business premises easily seen and accessible. The low rate of commercial activities (2 % of total town area) suggests the need for improvement. The sporadically distributed commercial activities also results in spread of environmental impacts throughout the town.

1.7 TRAFFIC AND TRANSPORTATION

1.7.1 The principle modes of transportation within the Union Territory are roads and waterways. During 1982-83 the total road lengths in the islands was 695 km., which increased to 733 km. during 1987-88 and to 850 km. at present. South Andaman, where Port Blair is situated accounts for 281 km. length and the town has 65 km. within it. Apart from the land transport and vehicles, ships, boats, steamers, ferries are available for inter-island transportation and for mainland, Indian Airlines and several private airline services link Port Blair with Chennai, and Kolkata. It is estimated that about 25,000 passengers, 40,000 kg of mails and 500 tonnes of freight exchange between Chennai and Port Blair, through air service alone. The ship services carry 1.25 lakh passengers and 1.1 lakh tonnes of Cargo every year. Fore-shore services carry 2.5 lakh passengers and 35,000 tonnes of cargo every year.

1.7.2 Within the town of Port Blair, due to its organic growth, terrain and topography meandering road pattern is observed. The form and pattern resembles open order settlement and the roads are very steep (more than 1:3) and plain in certain regions. Map.3 shows the predominant road network in Port Blair. The plots and sites on steep slopes make accessibility difficult. Traffic congestion and bottlenecks are observed on several roads due to location of government workshops and private automobile workshops and garages all along the road margins reducing effective width of roads. Several road junctions in Aberdeen, Clock Tower, Haddo, Sports complex and others need immediate attention. Most of the roads are subjected to encroachments and these roads have reached saturation point beyond their carrying capacity. The total area under roads is 133hectares i.e. 7.5% of total area which is more than the desired norm of 5 to 6%. This is mainly due to the hilly terrain and rolling topography.

1.7.4 The existing air-port is a civil enclave and is with the Defence. It is located at the heart of the town, surrounded by hills on both sides and has limited scope for expansion. It has a uni-directional run-way. During adverse weather condition, the run way gets

inundated and results in disruption and delay of flights. However, recently it has been declared as an International Air Port by Government of India. The Air Passenger traffic has increased to 130% from November 2005 to November 2006 for Port Blair. Air link is observed to be most popular between the island and mainland.

1.8 PHYSICAL INFRASTRUCTURE

1.8.1 At a macro level the islands have no major water sources. Even with urbanization of certain areas, in the absence of any perennial rivers or streams and with a saline and brackish ground water, treated and protected water supply becomes a challenge. The main source of water for drinking purpose and domestic consumption is through collection of rainwater in natural reservoirs and small check dams and wells. The main water sources for Port Blair within South Andaman are indicated in table 1.8.1.

Table No. 1.8.1 Port Blair - Sources of Water Supply

SL.NO.	NAME	STORAGE CAPACITY (MLD)
1.	Dilthaman Diggi	0.20
2.	Jawahar Sarovar	2.70
3.	Lambaline Diggi	0.70
4.	Nayagoan Diggi	1.17
5.	Dhanikhari Reservoir	18.20
	Total	22.97

1.8.2. The water supplied to Port Blair and its environs are treated at the four locations mentioned in table 1.8.2 with their capacities. Treated water from these plants is distributed to various parts of the city and sub-urban areas, through pumping stations. The four main pumping stations are: (i) Police Hill pumping station, (ii) Buniyabad pumping station, (iii) A.I.R. pumping station and (iv) Dairy Farm pumping station. Map no.4 shows the sources of water, location of treatment plants and pumping station. Water supply to the town is provided by Port Blair Municipal Corporation (PBMC) and to the rest of the areas by the Andaman Public Works Department (APWD) mainly through lorries. At present the total demand of water for Port Blair urban areas is estimated as 21.74 MLD. But the present daily supply is 17.79 MLD, leaving a short fall of around 3.95 MLD. The APWD has projected that the shortfall will increase to the level of 12.18 MLD by the year 2020. The water supply to the consumers is on alternate days only. Further the duration of water supply varies between localities ranging from 20 minutes to 60 minutes. Water tariffs for domestic supply are heavily subsidized being Rs.18/- per month. Tariff rates for religious institutions are treated as domestic connection, while for commercial, establishments, institutions, Government Departments it varies.

Table No. 1.8.2 Location of Water Treatment Plants

LOCATION	CAPACITY LITRES / DAY	TYPE OF FILTRATION
Lambaline	16,031	Rapid sand filtration
Dairy farm	2,992	Slow sand filter beds
Garacharma suburb	1,816	Slow sand filter beds
Dilthaman tank	6,00,000	Slow sand filter beds

1.8.3 Underground sewerage system is not available at present in Port Blair because of the challenges posed by topography constraints. Systems of individual and combined septic tanks are popularly in use in areas like Prem Nagar, Sweepers colony. The traditional conservancy system is still in vogue and practiced. Owing to the average yearly rainfall of 350 cm. and topography of Port Blair and its environs drainage forms an important issue. Sewage treatment is decentralised in most of the residential areas and dealt within the sites of government organisations or institutions.

1.8.4 Out of the total 18 wards in Port Blair, Mohanpura is considered to be most problematic with an intricate network of drains. These drains flow directly into Bay of Bengal at various outlets. The main drainage originates from Goal Ghar and following the existing terrain, falls at Phoenix Bay carrying all the discharge of the subsidiary drains on the eastern and western sides of the trunk drain. The present Airport complex and surrounding areas also drain into Bay of Bengal. The outlet drains of Mohanpura are at Phoenix Bay and the Airport region near Corbyn's Cove. Wards 6 and 8 have problem of drainage congestion and stagnation owing to non-functioning of drains. All the above point to the fact that effective treatment of sewage is necessary before draining into sea in order to conserve marine ecosystem. Considering the volume of sewage generated in the town (12.5 MLD) more sites for disposal are required.

1.8.5 Since there are no separate sewer lines at certain places, the sewage joins the natural drainage system and is let out on to sea. Garbage refuse in places like Haddo and commercial areas clog the drains at slopes which are gentle or relatively flat. The carrying capacity of most of the drains is much less than the average rainfall and hence the drains overflow and inundate adjoining areas leading to environmental hazards. Houses built on steep slopes have cut through the terrain for a flat base and thus reduce the natural flow of rain water. After the Tsunami 2004, invasion of sea water in flat areas has turned into a problem.

1.8.6 With the constitution of Port Blair Municipality in the year 1967, the responsibility of solid waste collection and disposal rests with the municipality. The municipality

employs about 1150 workers, who collect about 50 metric tonnes of garbage per day. Garbage is collected in Port Blair town at 68 locations through door to door collection system. However segregation of garbage into degradable and non-degradable has not been achieved. The garbage is collected by 10 garbage trucks (Hydraulic Tipper Trucks) and 2 Dumper placer Trucks (with the facility of Mechanical placement). Each truck has a carrying capacity of 4 to 5 cubic meters and runs twice a day.

1.8.7 Brookshabad is the place where segregation of garbage is done and plastic are disposed off through a plasma pyrolysis plant located there. Bio-medical waste segregation is given importance, by separating them at generation points. Waste disposal at wharfs and Dock yards are not properly handled. It has been gathered that the garbage from the ships are currently thrown into the sea directly without collecting them in polythene bags before disposal. Garbage thrown by tourists and dwellings on the coast into the sea are brought back to beaches on coastal stretches by the waves. Corbyn's cove beach is a standing example. Garbage cans are collected by the tipper trucks. It is also ascertained that some of the stretches within the city do not have daily collection of garbage leading to spillage and causing environment degradation. It is also observed that where door to door collection of garbage is not there, they are dumped on the nearby empty grounds in plots acting as breeding grounds for insects, flies and mosquitoes. Solid waste management in the Island and Port Blair in particular is not satisfactory and require environmental considerations and sensitive solutions.

1.9 SOCIAL INFRASTRUCTURE

1.9.1 South Andaman including Port Blair can boast of 22 pre-primary, 54 primary, 24 middle, 16 secondary and 24 senior secondary schools. In addition 1 industrial training institute, 2 polytechnic, 1 teacher training institute, 1 B.Ed., college and 1 government college are located in Port Blair. Higher education facilities are available as indicated in the table 1.9.1. Schools are spread throughout the island and it is observed that there has been no substantial increase or expansion of this facility. Education is provided free in Andaman and Nicobar Islands. It is highly subsidised with free text books and uniforms to all tribal students, and to students of poor families. Free travel concessions are provided to students attending schools beyond 4 Km. of their residence. The Teacher's Training Institute at Port Blair provides two year instructions at undergraduate level to primary school teachers. Computer education is provided to girls under the social welfare scheme. The State library at Port Blair is well established with more than 83,000 volumes.

Table No. 1.9.5 Higher Education Facilities in South Andaman

SL. NO.	FACILITY	NO. OF INSTITUTION	ENROLMENT OF STUDENTS	TEACHING STAFF
1.	Industrial Training Institute	1	192	8
2.	Teachers Training Institute	1	123	17
3.	Polytechnic	2	407	40
4.	Teachers College (B.Ed.)	1	139	18
5.	Government Arts / Science College	1	2039	98

1.9.2 As far as Port Blair is concerned, compared to the region of South Andaman, though educational facilities are adequate in terms of number and quality, the distribution is not rational in terms of accessibility. The student-teacher ratio has improved to 19:1 in 2006. Concentration of prime and important educational institutions in Port Blair points it as an important educational centre apart from being the administrative centre. As mentioned earlier the education department is setting up “Ashram Schools” for tribal settlements, with free boarding and lodging facilities. Considering the fragile nature of environment in the islands, school education policy may have to sensitize students on Environmental Education and Sustainable Development. Similarly, sensitization of the community and younger generation of students towards Forest education, focusing on conservation, preservation and forest resources. With all the efforts to improve education at all fronts, it is observed that the tribal people are not able to cope up with the mainstream of island students. The dichotomy needs to be socially dealt with.

1.9.3 It is observed that Educational facilities are adequate as per the UDPFI guidelines. The island authorities have taken up lots of efforts in strengthening the education so far through several other schemes. Early Childhood Care and Education (ECCE.), Improvement in Academic Inputs, Community Participation, Science Education, Integrated Education for Disabled (IED), Adult Education, Sarva Shiksha Abhiyan, Computer Education, Enhancement of Merit Scholarships and Upliftment of Rural and Tribal Education are some of the schemes. However after the Tsunami 2004, accessibility and mobility of teachers and students had a setback.

1.9.4 Port Blair and environs witness the presence of health institutions from the highest level to the lowest level, with good strength of support staff. In spite of certain constraints, demographic indicators of the Union Territory present a very good picture of

health facilities available. The following tables 1.9.4 (a), 1.9.4 (b), 1.9.4 (c) show the demographic indicators, health institutions available in South Andaman and man power in health sector during the year 2005 respectively.

Table No. 1.9.4 (a) Demographic indicators – South Andaman (2005)

SL.NO	INDICATOR	VALUE / 1000 PPL
1.	Birth rate	17.81
2.	Death rate	3.41
3.	Infant mortality rate	17.33
4.	Total fertility rate	1.9
5.	Institution delivery	88
6.	Couple protection rate	58.16

Source: Island wise Statistical Outline – 2005, Directorate of Economics & Statistics

Table No. 1.9.4 (b) Health Institutions – South Andaman (2005)

SL. NO.	INSTITUTION	TOTAL NO.
1.	Hospital	1
2.	Community Health Centre	1
3.	Primary Health Centre	4
4.	Urban Health Centre	5
5.	Sub Centre	26
6.	Dispensary	2
7.	Total Bed Strength	565

Source: Island wise Statistical Outline – 2005, Directorate of Economics & Statistics

Table No: 1.9.4 (c) Manpower in Health Sector – South Andaman (2005)

SL. NO.	HUMAN RESOURCE	TOTAL NO.
1.	Doctors	90
2.	Nurses / Midwives/LHVs	269
3.	Para Medical Staff	1002

Source: Island wise Statistical Outline – 2005, Directorate of Economics & Statistics

1.9.5 The 450 bedded General Hospital at Port Blair is the only referral hospital for the entire territory. This hospital has emergency treatment facilities for patients, ambulance

services, and tele-consultation / online services. All the Primary Health Centres have a minimum of 10 beds each and Community Health Centres have a minimum of 50 beds and diagnostic facilities. The Sub Centres are located approximately at 5 Km. and Primary Health Centres at 10 km. distance. In addition, there are eight Homeopathy Dispensaries and one Ayurvedic Hospital in and around Port Blair. It is observed that modernization of equipments and increased staffs are required to improve health care. All health facilities are provided free of cost including investigation, treatment, medicines and diet. The occurrence of AIDS and HIV +ve cases, cause concern requiring special attention. About 301 cases of HIV +ve have been detected till 2006. With the increasing population and tourist population, and declaring the airport International, locals as well as foreigners require a super speciality hospital, considering its proximity to South East Asian countries.

1.9.6 Health care facilities are comprehensive and adequate for the animals and live stock in the surrounding region of Port Blair. There are three Veterinary Hospitals, four Veterinary Dispensaries, seven Veterinary Sub-Dispensaries, one Veterinary Poly Clinic, two Disease Investigation labs and fifteen artificial insemination centres and sub centres. Though most of these are concentrated in Port Blair, they greatly benefit the entire South Andaman Island.

1.9.7 A broad list of community facilities discussed here for Port Blair surrounding region include Postal service, Telecommunication, Mass Media, Banking, Co-operatives and Social Welfare. There is one head post office at Middle point, and thirteen sub-post offices distributed in South Andaman. There are nineteen telephone exchanges with 29,442 telephone connections. There is one telegraph office. Around 187 public call offices are available in the South Andaman. The South Andaman region has more than 304 telephone extensions and 679 long distance (STD/ISD) public call offices. Local pay phone and faxing facilities are available. As for Mass Communication is concerned there are two Doordarshan transmission centres and one Radio transmission centre in Port Blair.

1.9.8 The Banking and Co-operative sectors are good and fairly distributed. There are two nationalized banks, eleven commercial banks, twenty three commercial bank branches and twelve co-operative bank branches. It is seen that 573 societies have been registered.

1.9.9 In terms of social welfare facilities, South Andaman has five Balwadi centres, sixty one crèche centres and five craft centres. Womenfolk greatly benefit from these. South Andaman region has 265 fair price shops regulated by the civil supplies corporation, 10 cater to the local towns requirement. Though four cinema halls are available the patronage is limited. Facilities that are concerned with law and order are adequate. South Andaman has six police stations, one police outpost, 7 fire stations to take care of law and safety of the people in the region. However, the Community facilities such as Kalyana Mandapams and Community Halls are not adequate for the population.

1.10 RECREATION AND TOURISM

1.10.1 Emerald Islands or Bay Islands more commonly and popularly known as Andaman and Nicobar Islands is an archipelago of 572 islands. These islands covered with dense evergreen forests with exotic flora and fauna, sandy beaches, meandering coastline, mangrove lined creeks, ferry services and unpolluted fresh air are sure to produce a life time memorable experience. Town of Port Blair is strategically located in South Andaman and connected to other tourist spots with an international air-port. Detailed analysis of tourism sector reveals that the emerald islands have a potential in the future. Tourism is bound to generate employment, developmental activities, foreign exchange, and improve economy.

1.10.2 Some of the most important Inter Island destinations are:

- **Ram Nagar beach:** A sandy beach located at Diglipur Island is connected by two daily boat services from Port Blair twice a week.
- **Barren Island:** This land of live Volcano is located at 135 km. from port Blair. It is about 3 km. diameter, half a kilometre from shore, dramatically rises from the sea. Can be visited on boat vessels.
- **Cutbert Bay Beach:** Located 20 km. away from Rangat tour's bazaar has a seasonal turtle nesting ground from December to February. Rangat town is 170 km. from Port Blair, is linked by Andaman Trunk Road, also has Panchavati water fall and Amkunj beach.
- **Long Island:** the sea surrounding this island is frequently visited by dolphins and it is connected by boat four times a week from Phoenix Bay.
- **Karmatang Beach:** It is located at 240 km. by road and 136 km. by sea from Port Blair, in the town of Mayabunder. Turtle nesting grounds and Mangrove Creeks are its attraction.
- **Viper Island:** The first jail for freedom fighters of India was built by Britishers here and was abandoned after building the cellular jail at Port Blair. In the gallous atop a hillock was hanged Sher Ali, who killed Lord Mayo, Viceroy of India in 1872.
- **Neil Island:** More popularly serving as the Vegetable bowl of Andamans, is 36 km. by sea and is connected by boat from port Blair 4 days a week. It has the beaches at Lakshmanpur, Baratpur, Sitapur and the natural bridge formation on the sea-shore.
- **Havelock Island:** It is 50 km. by sea from Port Blair near Neil Island and has the Radha Nagar Beach, Vijayanagar Beach, Seasonal Snorkelling and Scuba Diving facilities.

- **Red Skin Island:** Located South West of Port Blair and approached from Wandur jetty, this island has the large Mahatma Gandhi National park, and offers breath taking view of Coral Marine Life.
- **Jolly Buoy Island:** Located beyond the Red Skin Island, this place offered a breath taking view of Coral & Marine life. It can be best viewed with the help of the Glass bottomed Boats, that take you ashore.
- **North Cinque Island:** Exactly south of Port Blair are the North Cinque Island and South Cinque Island linked by the irresistible sand bar. North Cinque Island has a wildlife sanctuary and journey to it is memorable for its under water coral gardens.

1.10.3 Some of the most important Intra Island Tourism destinations in and around Port Blair include:

- **Cellular Jail:** Located on the North East of Port Blair town was completed in 1906 and is a National memorial. It derives its name for its individual cells for the solitary confinement of our freedom fighters and prisoners. The Government of India have taken efforts to maintain and landscape the entire campus which attracts lots of tourists.
- **Chatham Saw Mill:** Located on the North of Port Blair and in the Chatham Island is this Asia's largest saw mil. It is approached from Port Blair through a bridge over stretch of water.
- **Ross Island:** It was the Original Capital during the British regime and this tiny island (0.6 sq. km. area) is 10 minutes journey from Port Blair. The island houses the ball room, Chief Commissioner's house, Government house, Church, Cemetery, Hospital, Bakery, Press, Swimming pool and Troop barracks all in extreme dilapidated condition reminiscent of bygone British era.
- **Corbyn's Cove:** The coconut farmed beach is 7 km. from Port Blair. Tourist facilities like hotel, restaurant, bar, changing room are available near the beach. Historical Japanese bunkers can be seen here. Snake Island is nearby and it is recommended for scuba diving.

1.10.1. In addition to these, Port Blair has a City Aquarium, Andaman Water Sports Complex, Son-et-Lumiere shows at Cellular Jail, Marine Museum, Zoological Survey of India Museum, Forest Museum and Science Centre. Haddo area accommodates Mini Zoo. Chidiyatapu, 25 km. by road from Port Blair as the southernmost tip of South Andaman is an ideal picnic spot for sun-sets. Sippighat, 14 km. by road from Port Blair, and Collinpur sandy beach 36 km. from Port Blair are suitable for swimming. Madhuban, 75 km. by road and 20 km. by ferry from Port Blair is a suitable area for trekking. The Island

authorities and Tourism department organises Festivals, Cultural Shows, Shopping Mela, apart from package tours and conducted tours. The predominant season is observed to be December to March.

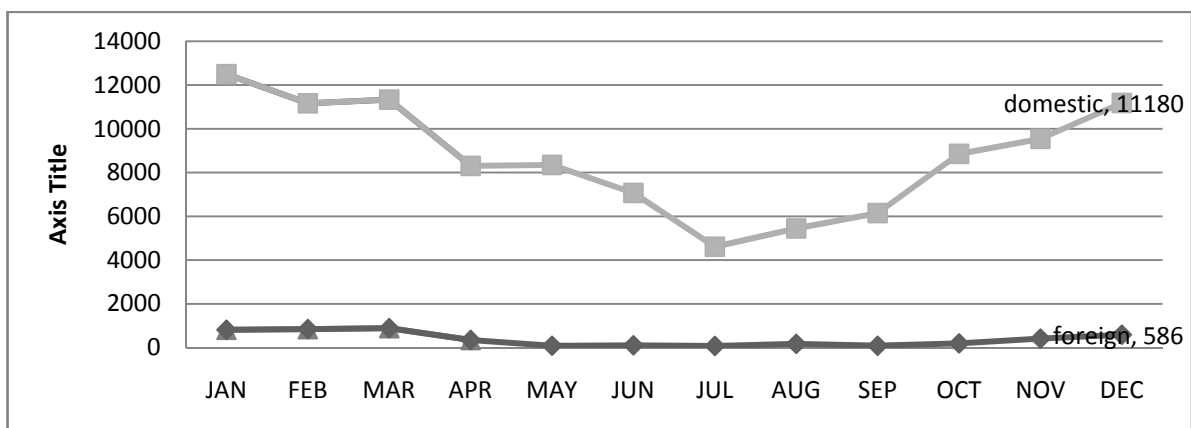
1.10.2. Tourist accommodation facilities are available both from the government and private sector. The available facilities are listed in Table 1.10.5. The average occupancy rate of organized accommodation has hardly reached 65%. The peak tourist volume in January (2004) was 13,309. The peak occupancy rate records 2667 beds as against available 2837 beds (94%). Tourism has not reached its full potential in generation or acceleration of economy in the Island though it offers vast scope for development. The Figure 1.10.5 indicates seasonal variation of tourists' arrival in 2004.

Table No: 1.10.5 Tourist Accommodation Facilities

SL. NO.	TYPE / CATEGORY	NO OF COMPLEXES	AVAILABLE BED	TARIFF RANGE IN RUPEES
1.	Private hotels affiliated to state tourism department	16	900	350-3650
2.	Government accommodation affiliated to state tourism department	19	586	150-2000
3.	Budget accommodation affiliated to state tourism department	45	1351	50-900
	Total	80	2847	

Source: Sustainable Development of Tsunami affected areas – Report by SPA, Delhi.

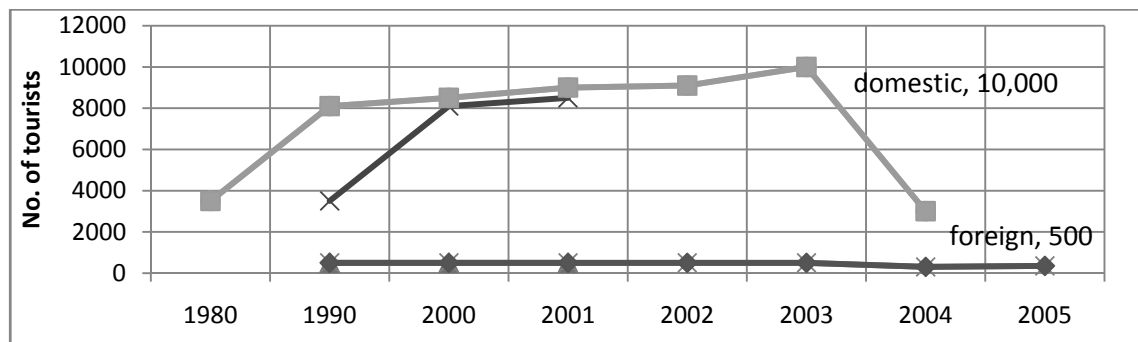
Figure No: 1.10.5 (a) Trends of Monthly Seasonal Variation in Tourist Arrival- 2004



Source: Sustainable Development of Tsunami affected areas – Report by SPA, Delhi.

Similarly the trend of domestic and international tourist's arrival, year wise is given in Figure 1.10.5 (b). From the figures 1.10.5 (a) and (b), it is clearly seen that the peak season for tourists' arrivals is December and January months with appreciable arrivals during October – November and February - May months. All eight months in a year can be taken for optimizing tourism potential in the islands. The annual growth rate of tourists has been 6.4% during 2000 to 2004. The overall growth rate from 1980-2004 has been 30.4%. There is a remarkable decline after December 2004, due to the worst Tsunami that struck the island in this period.

Figure No. 1.10.5 (b) Trends of Domestic & International Tourist Arrival



Source: Sustainable Development of Tsunami affected areas – report by SPA, Delhi.

1.10.3. Travel agencies recognized by Directorate of Tourism are observed to be adequate. Travel guides are restricted to only Cellular Jail and Ross Island, but are missing in rest of the places especially in places of Nature Tourism. The available tourist accommodation is inadequate at present. For projected period by 2026, it will face acute shortage. Choice of tourist accommodation, boarding facilities to suit all categories of tourist are satisfactory at present. However tourism sector needs to be sustainable and revision of policies especially in forms of private investments has to be considered. At the same time a set of regulatory mechanism is required to manage tourism activities.

1.11 ENVIRONMENT

1.11.1 Earlier in this chapter, in section 1.3 on physical characteristics and climate, some of the attributes have been discussed in terms of the islands' location, climate, topography, flora and fauna. Here, environment in its holistic sense with a focus on biodiversity and peculiar eco-systems of the island are discussed. These islands are rich in both terrestrial and marine eco-system. According to the State Forest Report, 84.42 % (6964 sq. km.) is the forest cover. Of total forest area, 42 % is under 'very dense forest', 34 % in 'moderately dense forest' and 8 % in 'open forest cover'. Open forest generally spread adjoining urban areas like Port Blair.

1.11.2 Government of India's National Forest Policy 1988 lays emphasis on preservation of ecology and natural resources. Out of 87 % of Notified Forest Area, 35 percent is under

Tribal Reserves, which are the home of six aboriginal tribes. The island has 96 Wildlife Reserves, 9 National Parks, and a Bio-Reserve which occupy an area of 1969 sq. km. The forest policy provides for adequate strategies, for management administration, conservation and protection of the fragile eco-system. Given this over-all perception of the environment, urbanization of areas, like Port Blair require a deep concern in terms of giving physical development guide lines.

1.11.3 Before drawing up the guidelines for future development, at the secondary level, a study of existing eco-system is essential. Eco-system in Andaman can broadly be divided into Forest Eco-System, Marine Eco-System and Urban Eco-System. Forest Eco-System can be further sub-divided into Evergreen eco-system and Semi-evergreen eco-system. Similarly Marine Eco-System can be further sub-divided into Mangrove eco-system, Coral reef eco-system and Sea grass and sea weed ecosystem. The Urban Eco-System can also be sub-divided as Plantations, Urban areas, Cultivable lands, Scrub lands and other areas.

1.11.4 A brief study of the flora and fauna in the island and region around Port Blair reveals that though the wild-life is rich, with variety, most of them are becoming endemic. Fresh water animals numbering 100, terrestrial animals numbering 2100, and marine animals numbering 2900 are characteristics to the island. The endemic mammals include Common Dolphin, Dugong, Crab Eating Macaque, Wild Pig, Blue Whale and Sperm Whale. In addition Estuarine Crocodile, Andaman water monitor, Reticulated Pythons, Green Turtle, Hawksbill Turtle, Leatherback Turtle and Olive Ridley Turtle are included. In the case of birds, White Bellied Sea Eagle, Osprey, Nicobar Pigeon, and Andaman or Grey Teal are some of the species which have become endemic. Details of eco-system are shown in Table 1.11.4.

1.11.5 Apart from the biotic environmental factors, a detailed study on biotic and man-made environmental issues is a pre-requisite for suggesting development plan for Port Blair. Major issues to be discussed here include changes in Hydraulic cycle, impact of Watershed, Natural Hazard considerations, Quarrying pollution, and Deforestation. In addition, review of Coastal Regulation Zone Notification (CRZ) and Coastal Zoning Management (CZM) notification are to be made.

Table No. 1.11.4 South Andaman: Salient Features of Eco-Systems

NAME OF THE SYSTEM	OCCURRENCE	FLORA	FAUNA
1. FOREST ECO-SYSTEM			
Evergreen ecosystem	Patches on the Western, South Western and South East of region.	Giant ever green and deciduous trees and heavy climbers.	Elephants, King Cobra, Indian Cobra, back Wood Pecker, and Lone Tailed Parakeet.
Semi evergreen ecosystem	Western and Southern and Eastern parts.	Irregular top story with tall deciduous trees second story with evergreen trees	Long Tailed Parakeet Wimberel Python and Andaman Krait.
2. MARINE ECO SYSTEM			
Mangrove ecosystem	10 Percent of land area	Mangrove as spawning and breeding ground.	Fish, Prawns, Lobster, Eel, Fiddler Crab, Slapper Shrimp, Water Lizard Estuarine Crocodile.
Coral Reef ecosystem	Western, South Western and Wandur,	Anemones, Soft Corals, Sponges, Algae.	Fish, Crab Sea Urchin, Shrimp, Sea Cucumber, Green Sea Turtle.
Sea-Grass and Weed eco System	Occur along with Corals and inter-tidal regions.	Sponges Coelenterates, Molluscs, Sea Grass, Echinodems.	Hawksbill Turtle, Green Sea Turtle Clown Fish.
3.URBAN ECO SYSTEM			
Plantations	Port Blair region on South East and West	Plantation crops.	Hill Myna, Oliver Backed Sunbird, Parakeet, Andaman Krait, Pit Vipers, Worm Snake, and Andaman, Blind Snake.
Urban Area	City on settlement areas	Non-flowering and Flowering Plants, Scrubs.	Hill Myra, Glossy Swiftest, Andaman Krait Worm Snakes and Andaman Blind Snake.
Cultivable Land	4 Percent of town area adjoining forest areas	Agriculture Paddy Vegetables, Fruits	Sunda Teal or Grey Teal, Long Tailed Parakeet, Andaman Krait , Blind Snake and Worm Snake.
Scrub Land	Generally distributed in and around town in large channels	-----	Elephants, Brown Swamp Snake, Andaman Krait, Long Tailed Parakeet, Andaman Hawk and Dark Serpent Eagle.

Other Areas	Sporadically distributed in & around City mud flats and mud banks	-----	Sunda Teals, Wimberds, Water Monitor Lizard.
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Source: Sustainable development of tsunami affected areas – report by SPA, Delhi.

1.11.6 Changes in hydraulic cycle occur as built form replaces natural landscape. The movement of water is influenced by the human modified hydraulic cycle and the analysis of Port Blair city with respect to human modification of the natural land form shows that the steep slopes and natural drains are built on with city's population growth and infrastructure development. The superimposition of land use and drains, with slope analysis reveals conflicting zones and vulnerable areas. Modifications of drainage, alteration of soil quality and vegetative cover, use of surface and subsoil water mainly have contributed to changes in hydrological effects. These include i) a change in total surface run off, ii) an alteration in peak flow characteristics, iii) a decline in quality of water, and iv) changes in hydraulic amenities to include streams, and reservoirs. The transformation of natural land to urban purpose will result in decreased percolation, increased run off accelerated erosion and altered flood regions leading to submergence of land.

1.11.7 Impact of water shed becomes important since the water demand of Port Blair is tremendously increasing. The existing reservoir and potential water collecting areas are identified for enhanced utilization. But the lower standards of ground or sub-soil water reserve have brought pressure on rainfall as the only source. In Port Blair the dispersed pattern of water drainage or runoff has led to wastage of rain water and the town had to depend on streams and drainage channels.

1.11.8 Andaman and Nicobar Islands come under zone V of seismic activity. As mentioned earlier, since these islands lie on the borders of the Eurasian plate and Indo-Australian plate, which have shown signs of movement, it is a matter of concern not only for the seismic activity but also for its susceptibility to Tsunami waves. Such natural hazard consideration involves three main issues viz., i) CRZ IV regulations and recommendation in the light of recent costal management notification, ii) The elevation of lands up to 20 metres as suggested by the Institute of Ocean Management, Anna University, Chennai, and iii) No building zone of 200 metres to reduce the hazard on bio-shield potential. Though it is reported that there was no loss of human life in Andaman during tsunami 2004, damage is reported in destruction of corals, mangroves, coconut farms, fishing implements, sea fronts, communication links including shipping and ferry services.

1.11.9 Quarrying activities do exist in the Port Blair surrounding region but to a restricted area. Quarrying of hillocks are observed in Austinabad and PattarGaon, which provide

blue metal for these construction and quarry dust to make Celcrete or Hollow block which are becoming popular as a walling material in housing sector. In addition, cutting up of hillocks for construction purposes is observed.

1.11.10 Discussion on environmental considerations is incomplete without observations on various types of pollutions. The major types of pollutions happen to water, soil and air. The water bodies extent around 39 hectares in Port Blair. Recent developmental activities have resulted in the increase of ship movement and cargo handling. Main harbours are located at Chatham, Haddo and boat jetties at Hope Town, Phoenix Bay and Navy Bay, which have the following problems.

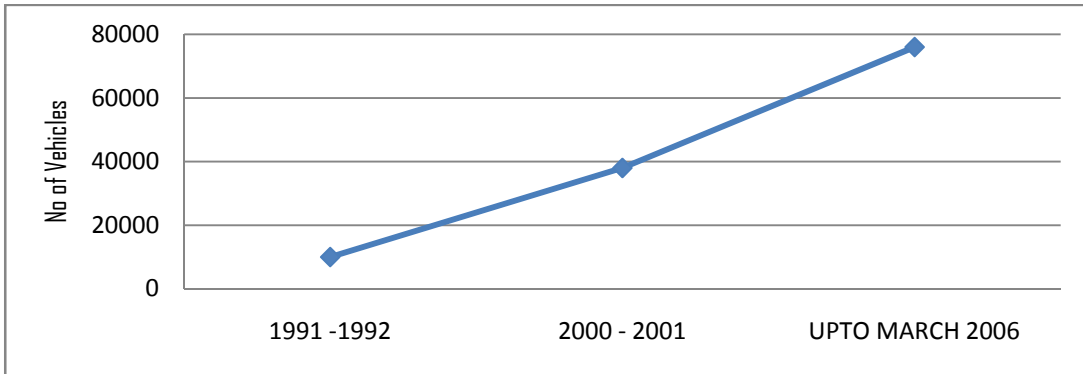
- Haddo handles both passengers and petroleum products with a wharf of 405 metres length and discharging of oil is observed.
- HOPE TOWN handles hazardous cargo like L.P.G. Cylinders.
- PHOENIX BAY handles passengers and cargo for inter-island services, resulting in solid wastes strewn around the jetty.
- However ship repair facilities, workshops and dry dock leads to marine pollution and the existing dockyard is getting congested.

1.11.9 Apart from such sea and marine pollution caused by the harbours, drinking water quality is observed to have changed as seen from the tests carried out by Pollution Control Board. Tests were conducted at Dhanikhari Dam, Dollygunj, Industrial Estate, Patharguda and Sippighat Creek. The levels of Biological Oxygen Demand (B.O.D.) were found to be high for three locations and turbidity of ground water at Patharguda is observed to be beyond the acceptable standards. Similarly the alkalinity for Industrial Estate was higher than the acceptable limits. One of the main reasons is observed to be the impact of Tsunami 2004.

1.11.10 The Tsunami 2004 has caused major changes in soil conditions through inundation of sea water. The sea water has seeped into ground water table. In certain localities, soil can be seen to have decoloured. Soil reclamation is essential to reduce soil pollution. Reclamation of alkaline soil needs addition of 'gypsum'. In reclamation Sodium is replaced by Calcium and Sodium salts are leached down. Of course proper drainage system plays an important role in preventing soil pollution.

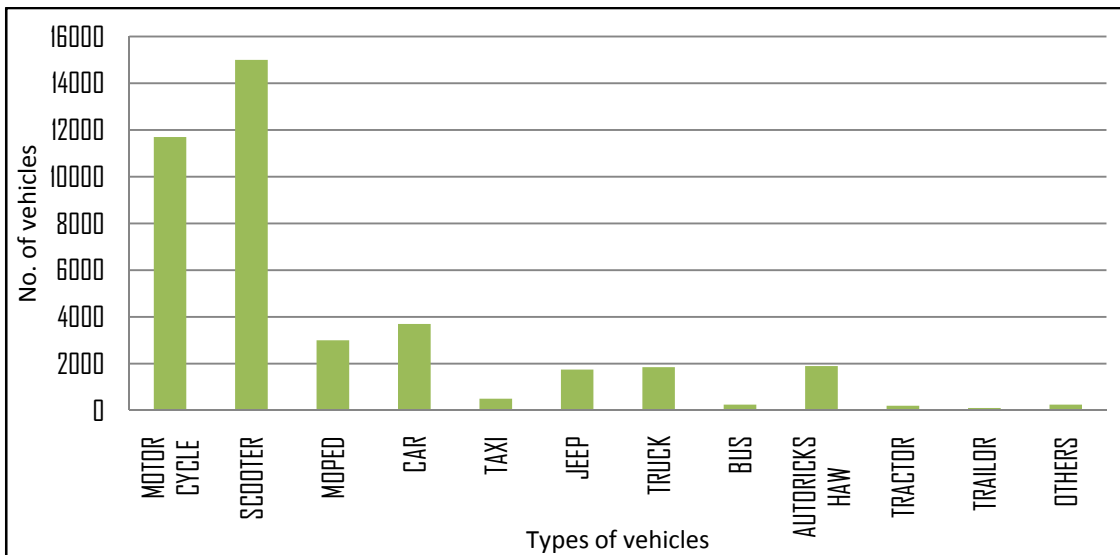
1.11.11 Port Blair and its surroundings, with its importance of administrative, commerce, trade and tourism activities along with its educational infrastructure is witnessing consistent growth of vehicles. The growth of vehicle population has resulted in noise pollution in different zones beyond permissible limits. Figure 1.11.13 (a) & (b) show the vehicular status from 1991-2006 and the type of vehicles registered up to 2006.

Figure No. 1.11.13 (a) Vehicular Status from 1991 – 2006



Source: Sustainable Development of Tsunami affected areas – report by SPA, Delhi.

Figure No. 1.11.13 (b) Vehicles Registration by Type in 2006



Source: Sustainable Development of Tsunami affected areas – report by SPA, Delhi.

1.11.12 The Pollution Control Board in Andaman and Nicobar islands has been regularly conducting noise level studies in Port Blair Town. It is observed that while residential areas do not have noise pollution (i.e. the noise levels are within the permissible limits of 40-50 dB. Commercial areas like Aberdeen and Goal Ghar record noise levels more than the permissible limits of 50-60 dB, both during day time and evening. The main sources of noise pollution are the use of audio players, air horns and engine noise of the vehicles. In certain silent zones including areas around G.B. Pant Hospital both day time and night time noise levels are observed to be high which is more than the permissible limits of 35 -40 dB. Further as mentioned already, the multi-cultural society of the island with a heterogeneous socio-cultural and religious life witness large number of festivals. Among these Diwali, Ganesh Pooja and Durga Pooja are the days

where noise levels increase both during day time and night time. Some of the areas worst affected include Delanipur, Aberdeen, Mohanpura, Gol Ghar and Junglighat.

1.12 LAND USE AND OWNERSHIP

1.12.1 A unique feature of land use distribution in Port Blair town (as of 2008) is the appreciable percentage of land in defence (12%), vacant (8%) and public and semi public (11%). As mentioned already the State Forest Report reveals that 84% of lands are under forest cover in the islands. Port Blair town accounts for 5% of lands within urban limits under forest. Port Blair and its environs have rugged, rolling topography with hillocks. Such elevations of lands on deep slopes inhibit land development and results in reduction of developable urban land. Growth of the town has been very slow till 1980s. After India's independence the settlements further developed slowly towards north and south of Port Blair. Table 1.12.1 (a) shows comparative land use distribution for Port Blair town from 1981 - 2001.

Table No. 1.12.1 (a) Comparative Land Use Distribution: 1981 to 2001 – Port Blair

LAND USE	1981		1991		2001	
	IN HA	%	IN HA	%	IN HA	%
Residential	231.14	16.35	298.14	21.08	675.05	30.05
Commercial	8.12	0.57	34.16	2.42	37.92	2.14
Industrial	5.78	0.41	5.67	0.40	13.47	6.76
Public/ Semi Public	86.46	6.11	92.02	6.51	136.01	7.87
Transport	141.35	1.21	145.20	1.57	197.09	11.16
Recreation	17.11	1.21	22.20	1.57	101.25	5.71
Agriculture	155.00	10.96	48.00	3.39	83.63	4.71
Defence	139.00	9.34	172.12	12.19	329.08	18.55
Forest And Others	637.04	45.05	595.46	42.11	199.60	11.25
Total	1414.00	100.00	1414.00	100.00	1774.00	100.00

Source: Sustainable Development of Tsunami affected areas – Report by SPA, Delhi.

The annual growth rate of residential area on an average is 0.08% per year. Similarly for commercial area it is 0.07% per year, for industrial it is 0.02% per year and for public and semi public it is 0.08% per year. Forest and other related lands indicate conversion of lands for urban development. During 2006, a substantial amount of land about 360 hectares from Brookshabad was added to the town of Port Blair owing to the demand for urban land. The breakup of land uses for Port Blair town as surveyed in the year 2007/08 is indicated in table 1.12.1 (b).

Table No. 1.12.1 (b) Land Use Distribution: 2008 - Port Blair

LAND USE	AREA (HA.)	AREA (%)
Residential	641.03	36.13
Mixed Residential	4.56	0.26
Commercial	37.19	2.10
Industrial	26.71	1.51
Public & Semi Public	198.50	11.19
Traffic & Transport	157.43	8.87
Recreation	13.41	0.76
Agriculture	31.12	1.75
Defence	215.14	12.13
Reserved Forest	0.00	0.00
Other Forest	102.69	5.79
Mangroves	13.82	0.78
Water bodies	46.58	2.83
Burial Ground	10.01	0.56
Roads	130.11	7.33
Vacant	145.68	8.21
Total	1774.00	100.00

1.12.2 The land use break up for Port Blair town during 1981 indicate that the major land use like residential and important land uses like commercial and industrial form a very small part of the total town area. During this time Port Blair had eleven wards. During 1991, the population rose to 74,955 accounting for one third of population of Andaman Islands with a growth rate of 5 percent per annum. Land under residential and commercial uses increased during this period and also the recreational land use was marginally increased. A major slump or reduction in land use is observed in agricultural sector where it has dwindled from 10.96 percent in 1981 to 3.39 percent in 1991. Though the town originally covers an area of 14.14 sq.km., urbanisable land is only 40% i.e., 5.65 sq.km.. All governmental programmes, activities and buildings are spread throughout the town because of the absence of land regulation and management policy. A unique feature of ownership in the town and island is that substantial area are vested with Government and are let on long lease for 99 years to individuals and organizations.

1.12.3 During 2006, with natural growth of population, the town area got expanded to 17.74 sq.km.. With the expansion of airport in 1996, additional lands from Brookshabad, Austinabad and Pahargaon were included to form seven new wards making the total number to eighteen wards. The population of Port Blair town, as of 2001 Census is 99,984, growing at a rate of 6.8% per annum during the last decade. Land use map enclosed clearly indicates mixed residential land use zones and adhoc distribution of lands for government agencies. Defence lands are also seen to be sporadically distributed. The town is surrounded by Andaman Sea on the North, East and West with land form extending on the South. The stretch of land on the South consists of forest and agricultural land thus making future development difficult. Over the last 15 years all the vacant and open lands are occupied with unauthorized land uses and activities. All these point to the fact that the development and expansion of Port Blair and its environs is a challenging task. Map no. 5, indicates the land use 2008 for Port Blair Town according to the updated survey by the, Anna University for the Port Blair Municipal Area. Table 1.12.3 shows ward-wise area, residential concentration, population, gross and net residential densities for Port Blair town area.

Table No. 1.12.3 Residential Concentration – Port Blair

WARD NO	TOTA AREA (IN HA)	POPULATION	RESIDENTIAL AREA (IN HA)	GROSS DENSITY [PPH]	NET DENSITY [PPH]
1	62	5371	12	103	431
2	32	8257	18	258	456
3	126	6415	43	50	151
4	57	7135	41	125	175
5	64	4682	21	73	217
6	74	4471	21	60	168
7	30	6005	20	200	302
8	36	4941	18	137	271
9	57	5548	5	97	1110
10	159	9417	44	59	216
11	240	5195	107	22	49
12	63	4730	31	75	195
13	29	4162	16	144	265
14	71	4690	18	66	266
15	109	3653	41	34	90
16	47	4159	20	88	211
17	255	6124	123	24	50
18	271	5049	72	19	70
Total	1774	99984	675	1635	4651
Average	--	--	--	91	258

Source: State Development Report 2006

It is seen that the wards 17 and 18 are largest in terms of area. However, they present the least gross and net residential densities mainly due to the presence of Airport and Defence

establishments in their areas. The lowest gross density is 19 persons per hectare in ward no.18 comprising of Austinabad and Pahargaon. Highest is 258 PPH in ward no.2 Haddo area. Similarly the lowest net residential density is observed to be 49 persons per hectare in ward no.16 (presence of Airport) and the highest is 456 persons per hectare in ward no.2 (Haddo area). As mentioned already since availability additional land is restricted, re-densification in certain wards and additional lands in the environs of Port Blair may have to be considered.

1.12.4 The land value distribution indicates a high correlation between the residential densities and costs of land as stipulated by government. The land values vary considerably between central commercial areas and surrounding development areas. While the highest land costs reaches 750 lakhs per hectare (Rs.7500 per sq.m.) in areas like Aberdeen and Haddo, the lowest rate gets fixed at rupees 10 lakhs per hectare (Rs.100 per sq.m.).

1.13 DEVELOPMENT MEASURES

1.13.2 The Union Territory of Andaman and Nicobar Islands receives appreciable logistics, physical and fiscal support in the administration and management of the islands. The funds received from the Government of India apart from implementing various welfare schemes and measures have also been judiciously invested in various research and study reports. The Ministry of Environment and Forest, Department of Fisheries, and Department of Tourism have taken lot of interest and have come out with several long term measures and short term projects in the development of these islands. Major schemes and programmes also have been taken up and implemented successfully by the Andaman Public Works Department. Several projects and programmes are under various stages of implementation. With limitations of physical connectivity from the main land, the islands in general and Port Blair specifically have problems in terms of services and energy. Water supply, Sewage Disposal, Electricity and Energy are to be given additional importance on a sustainable basis despite the subsidies that they attract at present. After the Tsunami 2004, and other natural disasters like cyclone, high tides, inundation or submergence of lands, rehabilitation of communities have equally drawn the attention of the island administration.

1.13.3 After the enactment of Municipal Board Regulations, 1957 the Andaman Public Works Department have taken up several steps in the physical development of the island and Port Blair town specifically. As early as 1994, a Regional Plan was prepared by Town and Country Planning Organisation, New Delhi. The Outline Development Plan by School of Planning and Architecture, New Delhi, Andaman Islands Coastal Area Assessment Report by Equations - India, Ecologically sensitive Architecture Report by

the Expert Committee constituted by Ministry of Urban Development, Government of India in 1986, Sustainable Development of Tsunami Affected Areas: Report by School of Planning and Architecture and Indian Environmental Society in 2006, the State Development Report of Andaman and Nicobar Islands by National Institute of Public Finance and Policy, New Delhi in 2006 and several other reports give an independent and sectoral picture of programmes under implementation, to be taken up and future course of action for a plan period.

1.13.4 The Departments of Andaman and Nicobar Island Administration in the 11th Five year plan 2007-2012, have enumerated their policies, the ongoing programmes and programme to be taken up in the physical, social and economic spheres towards welfare of the state. It becomes imperative to have an overview of these programmes to have a development strategy and recommend specific plan proposals. The analysis and studies made so far in conjunction with the ongoing programmes leads us to various “issues and proposals” for laying down the “Plan Proposals” of the Master Plan. Table 1.13.4 gives some of the major programmes under implementation by various departments of the island administration that require land development and buildings.

Table No: 1.13.4 Key Programmes of XI Plan – Port Blair

SL. NO	SECTOR / SUB-SECTOR DEPARTMENTS	NAME OF THE PROGRAMME / SCHEME	REMARKS
1.	Energy – Electricity	Reclamation of 1000 sq.m. of land in Chatam Islands	Land augmentation from sea
2.	Social Sciences	Working Women’s Hostel Anganwadi Training Centre Dollygunj Vocational Training Centre for Disabled – Brookshabad Construction of 70 Anganwadis	All are land and building extensive programmes
3.	Education	Upgradation of Directorate Building	Building Programme - Physical
4.	Agriculture and Allied Activities – Animal Husbandry & Veterinary Services	Strengthening of Department Establishment of Slaughter House with modern facilities	Building / Physical Programme
5.	Health Services	Construction of PHC at Chouldari, South Andaman Up gradation of PHC at Tushnabad to CHC Strengthening the PHC at Garacharama Expansion of PHC building at Wimberlygunj Extension of Medical Ward in G.B. Pant Hospital	All are building/ physical programme
6.	Industries –Industries And Minerals.	Strengthening of existing Industrial Estate Wimberlygunj	Land Development Physical Programme

7.	Rural Development –Land Reforms- Revenue Department	Extension to Office of the Disaster Management & Assistant Commissioner	Building /Physical Programme
8.	Transport A) Port Management B) Civil Aviation C) Roads And Bridges	Completion of Quarters for Department Staff	Building /Physical Programme
		Extension to Port Blair Airport Extension to Port Blair Runway	Building /Land/ Physical Programme
		Improvement to existing roads in Port Blair	Economic Programme
9.	APWD Road Transport Municipal Council	Renovation of Directorate Building	Building /Physical Programme
		Upgradation of 41 Km. as double lane	Land – Economic Programme
10.	Science & Technology A. Bio Diversity Wild Life Conservation & Eco Development	Improvement to Government Saw Mill at Chatam	Building/ Physical Programme
		Conservation & Development of Mangroves & Literal Format	Social and Economic Programme
		Improvements to Directorate of Tourism	Building Physical Programme
11.	Housing APWD Department of Police Housing	Construction of 100 residential accommodation for Government servants	Land / Building /Physical Programme
		Addition of first floor accommodation with timber as eco-friendly material	Building /Physical Programme
		Renovation of Bachelor’s accommodation	Physical/ Economic Programme
12.	Revenue	Enhancing preparedness for Disaster Management Separate Directorate of relief and rehabilitation	Both Physical Programme

Source: XI Five Year Plan, ANI

1.13.5 An overview of these schemes and programmes indicate a demand for land. If we consider the projected schemes and programmes of the Five Year Plan (2007 – 2012) the situation is grim in terms of land availability within Port Blair. This chapter on the past and the present has covered all aspects which are crucial to the preparation of Master Plan. The development issues and prospects to be discussed in the forthcoming chapter will give a clue to evolve a strategy for the physical development of Port Blair.



LOCATION OF ANDAMAN ISLANDS

MASTER PLAN FOR PORT BLAIR PLANNING AREA - 2028

DRG NO
DMP 1



CLIENT

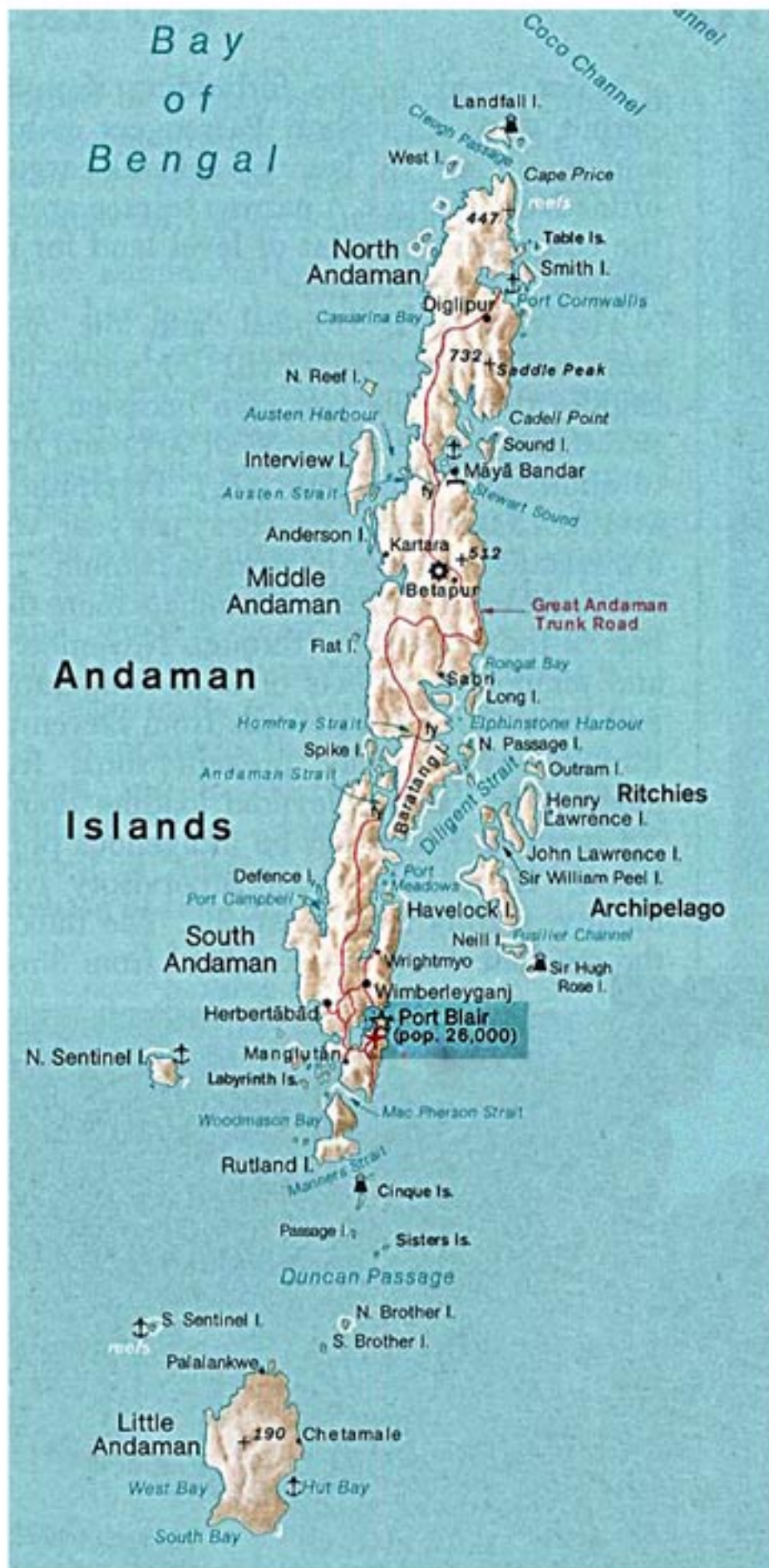
Andaman Public Works Department
A & N Administration, Port Blair

APWD

CONSULTANTS

School of Architecture and Planning,
Anna University Chennai, Chennai-25





LOCATION OF PORT BLAIR

MASTER PLAN FOR PORT BLAIR PLANNING AREA - 2028

DRG NO
DMP 2



CLIENT

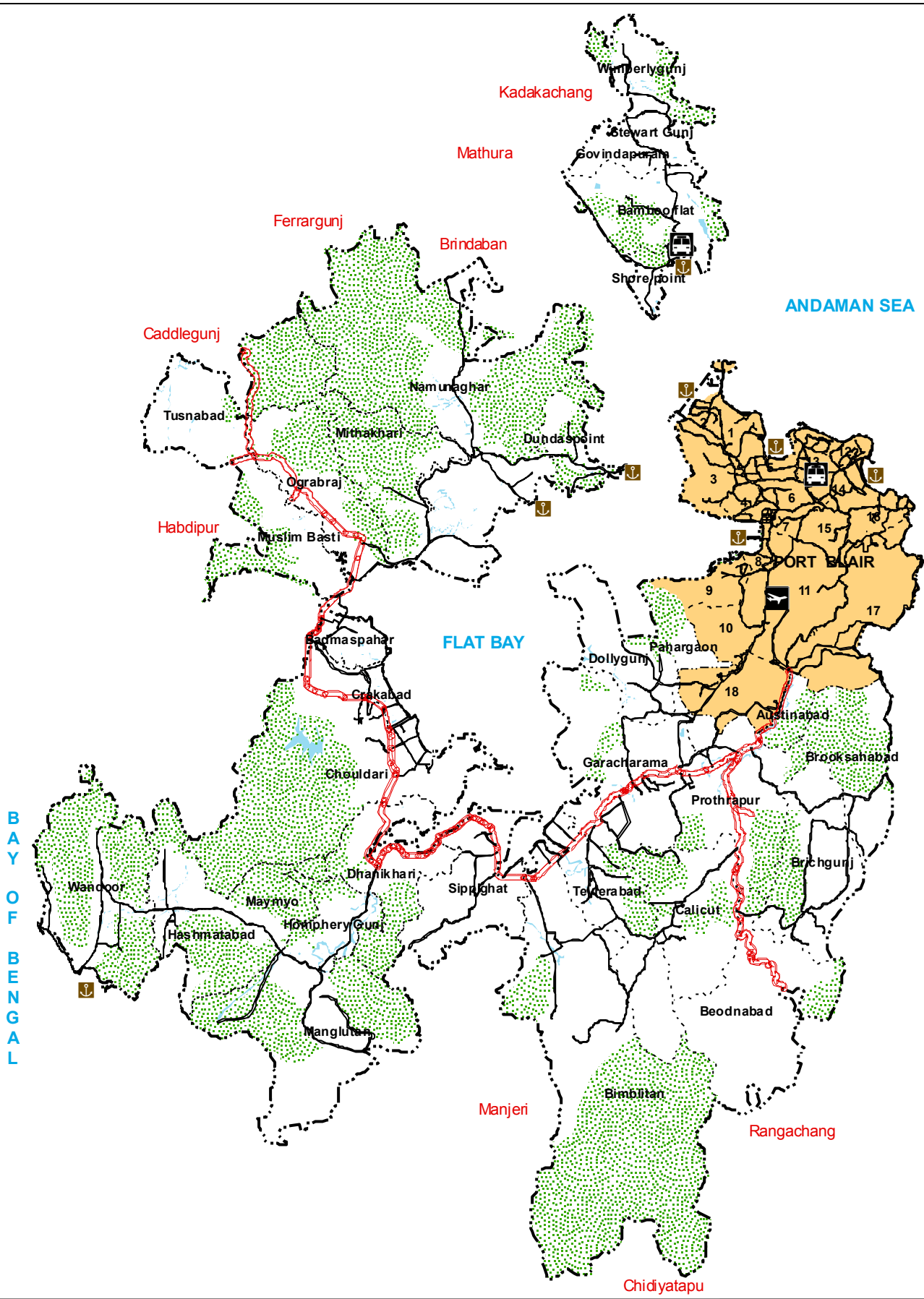
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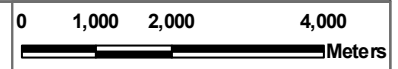
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LEGEND

- Andaman Trunk Road
- Other Roads
- Harbours & Boat Jetties
- Airport
- Busstand
- Water body
- Forest
- Port Blair Municipal Area
- P B P A Boundary
- Municipal Boundary
- Village_Boundary
- Ward_Boundary

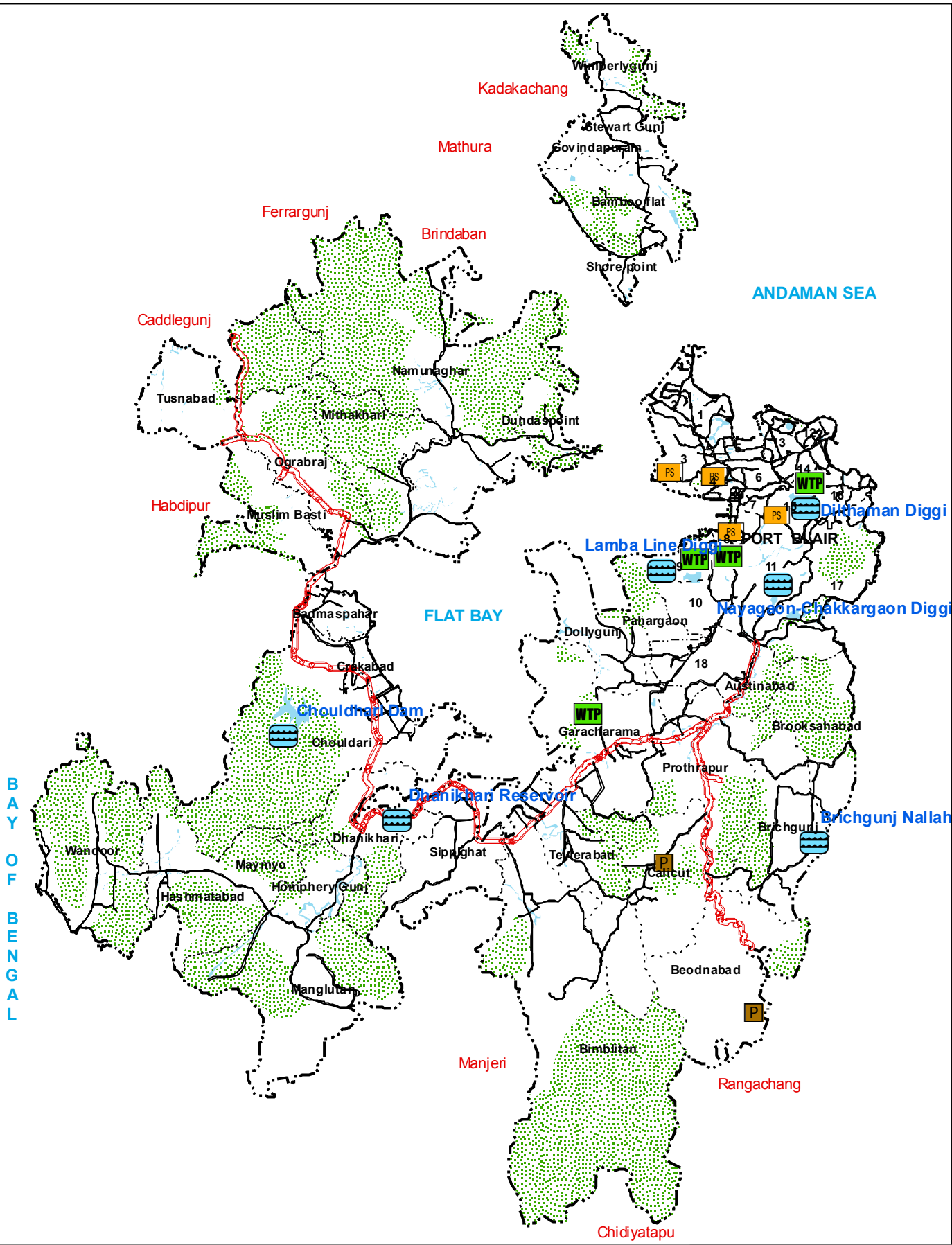


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 SPHEROID : WGS84
 ZONE : 46

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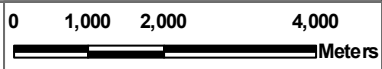
P B P A - TRANSPORTATION NETWORK 2008
MASTER PLAN FOR PORT BLAIR PLANNING AREA - 2028

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LEGEND

- | | | |
|-----------------------|--------------------|--------------------|
| Water Supply Source | Andaman Trunk Road | P B P A Boundary |
| Bore Well | Other Roads | Municipal Boundary |
| Water Treatment Plant | Water body | Village_Boundary |
| Pumping Stations | Forest | Ward_Boundary |



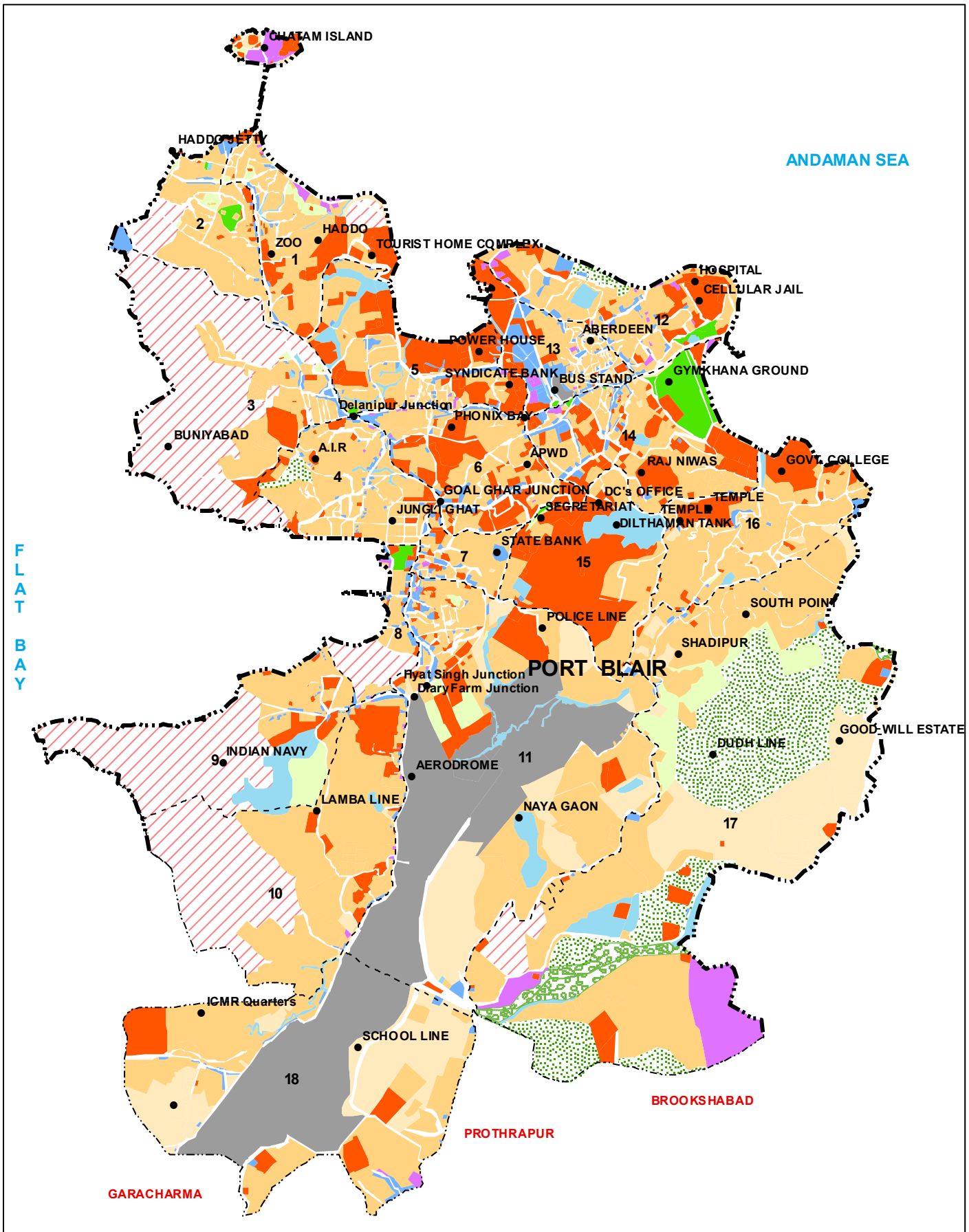
PROJECTION SYSTEM : UTM
 DATUM : WGS84
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 ZONE : 46

Scale 1 : 100000	DRG NO DMP 4	N
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P B P A - WATER SOURCES

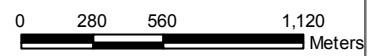
MASTER PLAN FOR PORT BLAIR PLANNING AREA - 2028

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LEGEND

Residential	Transport & Communication	Reserved Forest	P B P A Boundary
Commercial	Defence / Cantonment	Other Forest	Municipal Boundary
Industrial	Recreational	Submerged Land	Village_Boundary
Public & Semi-Public	Agriculture	Water body	Ward_Boundary
Vacant	Roads	Burial Ground	



PROJECTION SYSTEM : UTM
 DATUM : WGS84
 SPHEROID : WGS84
 ZONE : 46

Scale 1 : 30000	DRG NO DMP 5	N
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PORT BLAIR - EXISTING LAND USE - 2008
MASTER PLAN FOR PORT BLAIR PLANNING AREA - 2028

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2

DEVELOPMENT ISSUES AND PROSPECTS

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DEVELOPMENT ISSUES AND PROSPECTS

2.1 PHYSICAL

2.1.1 The town of Port Blair located in South Andaman has more than 34 % of lands under forest, agriculture, water bodies, vacant and defence possession and only about 66 % available for development. The land under development cannot be intensified because of steep slopes and the existing net density of more than 200 PPH is observed in most of the wards. This is a major issue and hence for expansion in future the development potentials of the adjoining settlements need to be considered. The second major issue is the fragile eco system of the island with 84 % under forest which restricts the carrying capacity of further developments.

2.1.2 The Islands and Port Blair to a large extent depends upon the main land for energy, consumer products and building materials. There is only a limited scope for augmentation of water supply and expansion of transportation network. Accessibility is another issue not only within Port Blair but also in the Islands as well. With limited institutional mechanism towards land management the town of Port Blair experiences encroachment and unauthorized construction, and environmentally evasive activities. The encroachments into revenue lands and forest lands pose greatest challenge for regulated development. Future development proposals for Port Blair need to consider these aspects.

2.1.3 The greatest strength that the union territory enjoys is the patronage of Central Government towards investment in various physical and developmental activities focused sector wise. In terms of electricity and energy, augmentation of generator capacity to meet future demand at Phoenix Bay, Bamboo flat and Chatham to reach per capita energy consumption at 1000 kwh/annum and exploration of Nuclear Power Generation, Ocean Wind, Biomass, Solar and Hydro – based production of electricity are receiving attention of the government. Similarly, Industries and Minerals sector have priorities for setting up Air Cargo complex, establishment of State Productivity Council, Island Entrepreneurship Development Institute, Food Processing Cell, Industrial Training Centre, Exhibition centre and Software Technology Park. Identification of appropriate lands for implementing such physical development projects is a prerequisite.

2.1.4 It was observed that 1375 hectares of paddy area got submerged during Tsunami 2004 and 73% of agricultural land got damaged in the island. So the Agricultural sector has gone for high value (spices & fruits) and low volume (limited land) crops along with crop intensity and rotation of crop techniques. Apart from building up of terminal markets, composite live-stock farming and development of fodder seed production farm are envisaged for future. Some of these have to get located around Port Blair for which

land requirement is a must. Fisheries sector need facilities for fish processing units, cold storages, and marketing facilities. Fisheries museum and Aquarium at Shore Point are also contemplated, which require lands.

2.1.5 Under transportation sector, it is proposed to extend the present Airport and construct Helipads, Aviation infrastructure and Hangers in Port Blair. The road network in the town is such that it takes more than 2 hours to reach tourist spots like Wandur, Chouldari, Chidiyatapu and Dundas Point in the vicinity of Port Blair. In order to improve intra island communication, improvements and widening of roads is a must. Within Port Blair road improvements for a length of 50 km., is required to improve the carrying capacity. More than 28 km. of the Andaman Trunk Road needs to be improved, widened, with bridges. Similarly 18 km. of rural roads declared as State Highways are to be upgraded. The Comprehensive Traffic & Transportation Plan prepared by the Division of Urban Systems Development, Anna University has observed congestion at three critical junctions, need for widening the road connecting Chatham to Airport via Bhatubasti, Junglighat, Hyatsingh junction. Inadequate parking areas, limitation of city bus terminal at Aberdeen and movement of trucks within the city are the other issues to be addressed.

2.1.6 Water supply is an important sector which needs thrust as it is a challenging issue. The present requirement of water for Port Blair is 195 lakh litres per day. At present only 50 to 60 % of the total demand is met with restricted supply of 5 days a week in monsoon and 3 days a week in summer. In order to augment supply, in a phased manner, short term, medium term and long term measures are to be envisaged. Towards this, desilting of Dalthaman Diggi, revival of Dollygunj Diggi, raising the embankment of Chakkargaon Diggi and transportation of water from Rutland Island as short term measures are considered. Raising the height of Dhanikhari dam (5 metres), piped supply from Rutland Island and revival of Indira Nallah scheme are recommended as medium term measures. For permanent and long term solutions, Flat Bay Project recommended by Water and Power Consultancy Services (India) Limited (WAPCOS), and water desalination plant at Port Blair suggested by Engineers India Ltd (EIL) are receiving serious consideration.

2.1.7 Sewerage and Drainage system in Port Blair and surrounding region throws lot of challenges in terms of land availability, rainfall run off to the sea because of terrain. The comprehensive study report on sewage and drainage by WAPCOS, projects the sewage discharge to be 45 MLD for Port Blair surrounding region by the year 2037. Since terrain is hilly, it may not be possible for the sewage to flow in one direction and to take the entire sewage to one place cutting through hills & valleys would involve huge pumping cost. Hence, decentralized sewerage system is required. The location of sewage treatment plants need careful consideration in view of the fact that treated effluent will have to be disposed off into sea through a Marine outfall. One site near Mazar and the other near MES quarry

have been selected by WAPCOS and National Environmental Engineering Research Institute (NEERI).

2.1.8 Housing demand at present is apparently not felt as a major issue. However in absolute terms rehabilitation of slum dwellers, transitional accommodation of Tsunami victims and need for more government housing because of expansion of departments, bring in additional demand for housing. As against 26,500 employees in the government sector only 7340 are accommodated in government housing, the remaining being provided by rental accommodation.

2.1.9 Rehabilitation of slum and provision of housing for slum dwellers also is equally challenging. As per the study conducted by ANCON consultants, there are sixteen pockets or areas within Port Blair where slums are located. There are 2132 dwelling units with a total population of around 9,800. Map no. 6 indicates the spread of slum areas in the various parts of Port Blair town. Considering the fact that less than 10 % of population only are living slums and less than 10 % are below the poverty line, slums can be phased out in Port Blair through environmental upgradation programme. Sanitary condition and solid waste disposal are serious matter of concern. The main issue arises out of the fact that more 41% do not have toilet or water closet facilities, resulting in environmental degradation.

2.1.10 Acceptance of alternative building materials for walls in the place of celcrete or hollow blocks and roofing material in the place of GI sheets and concrete throws challenge in terms of sustainability. There is scope for using adobe clay walls, brick panel slabs, tiles and thatch which can become appropriate technology for the island. The recommendation of the committee set up by the Ministry of Urban Development in 1986 to promote aesthetic and ethnic or vernacular design details needs serious consideration and adoption.

2.2 SOCIAL

2.2.1 As the Islands in general and Port Blair particularly, the community of people indicate a heterogeneous society with a mixture of culture, religious and social values. The people indicate a high level of literary rate of 81% of males and 72 % of females in the town. Similarly, good health condition is observed. At the same time most tribal population except the Andamanese and Nicobarese keep themselves away and have not socially become cohesive. Analysis of social infrastructure and observations of State Development Report 2006, bring out the need for strengthening social infra-structure with a thrust on education, health, vocational and farmers training urgently.

2.2.2 Though the economic status of a society is an indicator of standard of living, quality of life in towns and cities depends on several social parameters and indicators.

The Human Development Report prepared by the United Nations Development Programme (UNDP), has generated three important indices of human development, namely (i) Human Development Index (HDI), (ii) the Human Poverty Index (HPI), and (iii) Gender Disparity Index (GDI). The Human Development Index has improved in ranking in rural areas i.e. from 12 in 1981 to 5 in 1991. The disturbing trend is seen in urban areas where the rank has fallen from 2 in 1981 to 4 in 1991, though as a consolation it indicates a reduction of urban-rural disparity. The Gender Disparity Index has improved from an index value of 0.645 in 1981 to 0.857 in 1991 indicating the attainment of women in overall human development. These statistics point out that in urban areas like Port Blair the declining human development index has to improve and requires strengthening social infrastructure for overall human development.

2.2.4 Among the various sectors of social sphere, education receives priority as the development of the society depends largely human resource. It was already observed that though education facilities are adequate at the higher secondary level, and students - staff ratio is adequate, the main issue in terms of physical planning is accessibility of schools in outlying areas in and around Port Blair. Most of the schools need infrastructure up-gradation in the form of land and building development. Specifically higher education facilities like vocational and technical training institutes to match the present needs and future is necessary. Professional and technical education at highest level is absent. There is a need for an engineering college which can offer programmes related to Environment, Bio-Diversity, Marine Biology, Ocean Research and Disaster Mitigation Planning. Considering the forest eco-system the islands Forest College at peripheral area can be thought off. The different Ashram Schools for tribal welfare which had problems of accessibility and location may be focussed upon in the surroundings of Port Blair town. With good forest reserve especially with Bamboo, cane, and Balsa, along with the support of indigenous craft skills, an Arts and Crafts College may also be thought off. Craftsman trained here can capitalize on tourists and visitors to the island through craft product.

2.2.5 Health and family welfare as the second factor of social sphere has to receive adequate attention. Demographic indicators present a very good picture of healthcare facilities available at present. However considering the future growth, strengthening of existing facilities and creation of new facilities are essential. Healthcare in traditional knowledge systems like Ayurveda, Siddha, Homeopathy and Unani, have not received adequate attention. Provision of such hospitals and dispensaries around Port Blair may have to be thought of. Health care in terms of animal husbandry and veterinary services as a value addition to economic development needs to be given adequate importance. The existing polyclinic sub dispensaries, dispensaries, hospitals and laboratory are just sufficient but needs to be developed further.

2.2.6 Though there are no problems of malnutrition in the islands and Port Blair, large number vitamin and iron deficiencies cases are reported. In order to solve these problems apart from creating awareness about foods, fruits and vegetables rich in minerals, government can ensure that vegetable, and fruit requirements for the islands can be grown locally. Vitamin and mineral rich local varieties such as bamboo shoots and “sahjan” can be cultivated outside urban areas. Vegetable and fruit farms need to get integrated in the land use planning not only in terms of physical sense but also in ecological sense.

2.3 ECONOMY

2.3.1 The State Development Report 2006 for Andaman and Nicobar Islands has pointed out a worrisome fact that there is a virtual stagnation of per capita income at a level of Rs.15,703 per annum during 2001-02, which of course is higher than the country's level of Rs.12,203. At the same time as a positive sign nominal income is growing annually at 8 % per annum from 1994 onwards. Similarly labour productivity indicates a declining trend with more than 30 % of population below 25 years and not contributing to potential workforce. The last general issue is that the performance of this Union Territory is poor compared to nation. It becomes pertinent to review the status of infrastructure development for greater economic growth. It is also clearly observed that there is relatively lesser exploitation of growth potential of primary and secondary sectors of employment. As mentioned already there are abundant natural resources having potential for tourism and fishery activities. In addition, the agriculture sector can support the economy.

2.3.2 **Fisheries:** With one fourth of the total coastline of India and about 80 % of the total Exclusive Economic Zone, ANI has significant potential in fisheries. The present level of marine fish production in ANI is 30,000 tonnes, which is about 12 % of the estimated potential. It has been reported by the Department of Fisheries that there are about 3,448 active and full time fishermen. The perspective plan of the Andaman and Nicobar Islands, drawn up for a period up to 2012, aims to exploit at least 40 % of the estimated potential of fishery (State Development Report of Andaman & Nicobar Islands- June 2006).

From the above facts, it is moderate to assume that at least 75% of the total fishing potential will be realized within the Plan period ending 2028. If we go by the assumption, the total additional number of jobs created due to fishing will be 9500, which will also create additional service employment.

2.3.2 The Fisheries department is aiming at facilities for storage, preservation of fish and processing the same, marketing facilities, running and maintenance of ice plants and cold-storage. Culture fisheries, modernization and up gradation of fisheries museum and

aquarium near Shore Point and construction of fishing services are some of the programmes that are likely to improve the economic activities in the Island.

2.3.3 Tourism: The importance of tourism is borne out by the vision statement of A&N administration which states that ‘the limited scope for industrial activities in the islands coupled with the decline in the wood-based industry pursuant to the Supreme Court judgment dated May 7, 2002 has led to tourism being identified as a thrust sector for economic development, revenue and employment generation in the islands’. Keeping in view of the fragile ecology and limited carrying capacity of the islands, the objective of A&N administration is to strive for sustainable tourism.

The Central Planning Commission of India forecasts Indian tourism to grow at 7 % for the international tourists and at 9-10 % for the domestic tourists. The ANI is ranked 27th and 22nd (out of 32) respectively in the number of domestic and foreign tourist arrivals. Tourism is increasingly considered to be the emerging life-line of these islands. The A. F. Ferguson & Co., in their report (2003) states that “the direct revenue from tourism with average stay of domestic tourists for 5 days and foreigners for 10 days with corresponding spending of 1000 and 2000 Rupees per person per day is expected to yield Rs.300 crores at current prices”.

From the above facts, it is evident that the fisheries and tourism sector offer enormous scope for employment generation and economic growth.

2.3.3 Agriculture: The nature of terrain and the soil profile especially after the Tsunami act as constraints for active traditional agricultural practices. However, this sector can support the economic activities by concentrating on high value and low volume crops. Cultivation of medicinal plants/spices, coconut and horticultural products are to be given thrust in this regard. State Level Agricultural Exhibition (Kisan Mela), establishment of Central Oil Testing Laboratory are programmes envisaged by the agriculture department for boosting the productivity. In addition, Composite Live Stock Farming, Fodder Production as nutrient to animals and Fodder Seed Production farm at South of Andaman are some of the programmes on the anvil.

2.4. ENVIRONMENTAL

2.4.1 Considering the ecologically fragile nature of the islands, and the need to accommodate future growth the following environmental issues assumes greater significance:

- i) Changes in the hydraulic cycle caused by built form underground water supply, and sewage disposal system.

- ii) The disbursed pattern of surface runoff causing wastage of the available rainfall
- iii) The depleting and lower standards of ground water and increased dependency of rain water requiring augmentation
- iv) Susceptibility to earth tremors, Tsunami and impact of Coastal Zoning Regulations IV, requiring stretches of land to be excluded from further urban development.
- v) Restriction and regulation of cutting clearing of hillocks, quarrying and mining activity in areas like Austinabad, Pahargaon, Dollygunj and Dairy Farm.
- vi) Regulating and restricting water pollution caused by cargo handling in harbours, ship repair works in the existing 21 Hectares of water spread in Port Blair and
- vii) Regulating and restricting the pollution caused to soil, water and noise levels in selected areas.

2.4.2 The main strength of the islands in promoting tourism is its environment. Emerald islands as it is otherwise called has 3.0 lakh sq.km., of marine wealth and culture fisheries. The beaches, the islands, the forest, the mangroves and the coral reefs constitute the biotic environment. These abundant natural resources need to be exploited. Similarly, the forest based activities needs to be enhanced. The vision statement of Andaman and Nicobar Island administration is to develop Andaman and Nicobar Islands as an upmarket island destination for eco – tourists through environmentally sustainable development of infrastructure without disturbing the natural eco-system with the objective of generating revenue, creating more employment opportunities. In keeping with the policies of Government of India and the Island administration the following issues emerge.

- i) Promoting high value low volume eco-friendly and environmentally sustainable tourism
- ii) To incorporate proposals of UNDP/WTD report 1996 on sustainable tourism
- iii) Encouraging private sector investment in development of tourism infrastructure.
- iv) Gradual privatization of management of tourism infrastructure and development of new tourism activities and
- v) Marketing Emerald Islands as tourist destination not only at national level but also at international level.

2.4.3 With such major issues emerging at the policy level, several micro level issues are observed as follows. The first and foremost seems to be connectivity between the islands and the main land. The entire tourist travel from India as already mentioned is routed from Kolkata and Chennai through air and ship. According to Rajavel (1998) Report and Foundation for Aviation and Sustainable Tourism (FAST 2002) Report it is seen that while 65% to 75% of domestic tourists travel by ship. Only 10% to 20% of international tourists choose this mode. However as on date with 4 private airliners compared to 2 in the past operating in this sector, and with declaration of Port Blair Airport as an International Airport and the air-fare becoming competitive, the scenario has changed.

2.4.4 The second issue pertains to transport within the island. Travel within the islands including Port Blair is characterized by long waiting time and lack of synchronization between alternative and complementary modes. The State Development Report 2006 says that on a very broad assumption, the speed of transit between the islands averages between 12 to 18 km., per hour. It is striking to note that as per Rajavel's survey nearly 58% of foreigners and almost 28% of domestic tourists did not go to any other islands because of the "risk perception" associated with ferry boat, country boat and doongies. About 32% of domestic tourists, and 10% of International tourists, who used private car, van and bus have generally expressed dissatisfaction because of the connectivity and quality of vehicles. The foreshore services that connect Port Blair to nearby islands require up-gradation of Port, anchoring, berthing, storage and processing facilities. One option or strategy is high quality intensive tourism development within a small geographical area. The sea transport and harbour facilities face constraints because of existing Coastal Regulation Zone (CRZ) guidelines. The air-transport and road transport facilities pose problem again because of availability of land is a constraint.

2.4.5 The third issue relates to problem and limitations in tourism policy and planning. Though the tourism policy provides for eco-friendly tourist resorts, camping grounds, up-gradation and privatization of existing guest houses, it is difficult to understand how such independent efforts of the tourism department helps to include Port Blair and the islands in the international air travel and international cruise route.

2.4.6 Fourth set of issues concern about security, environment and socio-cultural aspects. The proposal to set up a strategic nuclear command would take ANI into a critical security zone and is likely to cause impact both on domestic and international tourist and cargo movements. Environmental consideration discussed already, ban on, extraction of sand from the coastal area, commercial plantations in reserved areas and eviction of encroachers, all these call for a comprehensive strategy which can be implemented with a strong institutional mechanism and technically empowered planning

authority. On par with international standards and considering the size, shape and coverage width of the island and availability of land for development 50 metres of coastal protection with stringent parameters on intensity of development needs serious consideration.

2.4.7 Finally there are certain additional issues arising out of the above context. The first one relates to realistic projection of tourist traffic and estimating their duration of stay. It is seen that while majority of domestic tourists i.e. 84 % stay for less than 5 days, majority of foreign tourists stay for 15 days or more, which again is speculated. The State Development Report 2006 predicts that the direct revenue from tourism, assuming the above duration of stay and the domestic and foreign tourists spend Rs. 1000/- and Rs. 2000/- per day respectively is Rs. 300 crores at current prices. In such a scenario, development of eco-tourism can result in influx of large domestic and international tourists.

2.5 INSTITUTIONAL AND LEGAL

2.5.1 Port Blair, at present is the only urban Tehsil Headquarters, situated in the district of Andaman. The Municipal Board for Port Blair consists of three office bearers viz., (i) Chairman (ii) Senior Vice-Chairman (iii) Junior Vice-Chairman and eight elected members and four nominated members. All the physical planning and development works are executed by the Andaman Public Works Department under the control of the Chief Engineer. Examination of the town and regional area activities reveals that they are carried out by the Town and Country Planning Unit of the Andaman Public Works Department (APWD) under the control of an Associate Town and Country Planner, with minimum technical support. The APWD is essentially a prime construction agency of Andaman and Nicobar administration. The department is entrusted with the work of providing infrastructure support to the people, other departments of the administration and all other departments functioning under the control of ministries. The major activities include, i) Roads and Bridges, ii) Water supply and sanitation, iii) Housing, iv) Urban Development, v) Public works, vi) Minor Irrigation and vii) Civil aviation

2.5.2 The Town & Country Planning Unit of the APWD is occupied with updation of planning data and co-ordination of some of the developmental programmes. Empowerment of such a technical wing is necessary for an optimistic foresight, and spatial integration of all planning decisions. The existing town and country planning unit needs to be strengthened both in terms of technical manpower, finance and infrastructure.

2.5.3 It is seen that the Andaman and Nicobar Islands Coastal Zone Management Authority was constituted vide amendment S.O.No.992 (E) 26th November 1998 and the

latest notification regarding the extension of its members is dated 31st March 2005. This authority is specified with functions relating to all physical development and is supposed to perform with support of officials of Municipal Council, department of Revenue, Deputy Commissioner of the district for CRZ, and Divisional Forest officer. The various physical development projects are dealt individually on case to case basis and not in the light of a co-ordinated development plan. Alternatively co-ordination with Town Planning unit is lacking. Hence projects along the coast are sporadically developing. Finally though the entire island is under CRZ-IV, proposals for declassification under CRZ-II, in some coastal stretches of Port Blair, Bamboo flat, Hut Bay and Campbell headquarters are under active consideration.

2.5.4 A strong legal framework flexible enough for futuristic, directed growth strategy is important. In the absence of a strong legal framework, the growth strategy proposed can not be achieved. The Regional Plan for Andaman and Nicobar Islands and the Outline Development Plan (ODP) prepared by the Town and Country Planning Organisation, Government of India could not be implemented as they did not have the required statutory support. This Master Plan is set to fill the void.

2.5.5 Port Blair Municipality as well as the Andaman and Nicobar islands at present are governed by the following statutes or legal frame work which contain provisions for regulation and development of building and land activities:

- (i) The Andaman and Nicobar Islands (Municipal) Regulation, 1994 – effective from 8th Dec. 1994.
- (ii) The Andaman and Nicobar Islands Town and Country Planning Regulations, 1994 – effective from 19th Dec. 1994.
- (iii) Port Blair Municipal Council Building Bye-laws – effective from 13th October 1999.
- (iv) The Andaman and Nicobar Islands Town and Country Planning Rules 2005 – effective from 28th Sept. 2005.

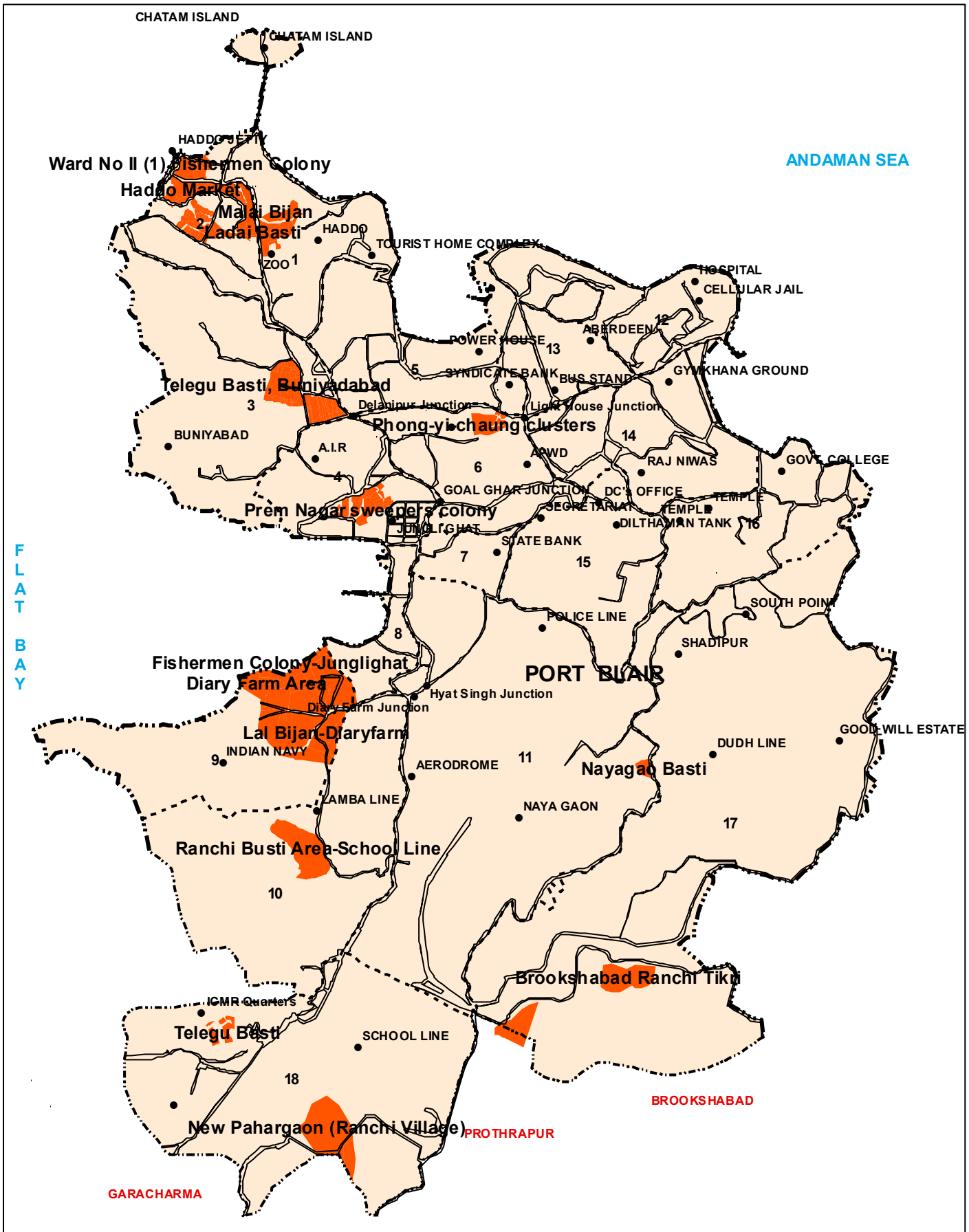
2.5.6 The Andaman and Nicobar islands (Municipal) Regulation, 1994 is the oldest statute covering the entire Union Territory of Andaman and Nicobar Islands. The entire focus and thrust is on governance, administration and management. Chapter X relates to Buildings, where the focus is on ‘sanctioning’ procedures. Clause 78(I) under chapter III makes provision for formation of sub-committees. It is seen that “Town Planning” is linked to “work and improvement” like other sub-committees on finance, taxation, public

health, sanitation, water works, education and social justice. Developmental activities need to get integrated within the frame work of the Master Plan and hence there is need for the separate sub-committee on planning.

2.5.7 The Andaman and Nicobar Islands Town and Country Planning Regulations 1994, again extending to the whole of Union Territory focuses on monitoring of town planning activity through an establishment and procedures in the preparation of Master Plan and implementation of the same. Sub section (3) of clause (II) and Clause (14) of chapter IV relating to regulation of land development after the statutory Master Plan and treating of “land”, as deemed to be for “public purpose” are strong and healthy provisions in this regulation. The realization of the goals and objectives set forth in the Master Plan is possible achieve with the establishment of the Department of Town and Country Planning.

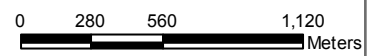
2.5.8 The Port Blair Municipal Council Building Bye-laws which came into force from October 1999 is perhaps the most detailed statute available to regulate all land and building activities and has direct public oriented responsibility. All the provisions are on par with Bye-laws of other States of India prepared and are being implemented. Mandatory requirement in the form of sustainable and green building concepts are needed especially for all government buildings. The present staffs are in-adequate to oversee all the building and land activities especially when this institution has to create a positive image as a societal asset. The responsibility becomes more critical considering the expansion of urban development activities beyond the Port Blair Municipal boundaries.

2.5.9 The Andaman and Nicobar Islands Town and Country Planning Rules 2005 are a well thought out and guiding statute in terms of preparation, publication, monitoring and implementation of Master Plan. These ‘rules’ again extend to whole of “Emerald islands”. The classification of development area as “urban, sub-urban and rural”, under Master Plan is a constructive suggestion. However it is felt integration of ecologically sensitive areas, sub-classification of areas subjected to natural disasters, monitoring of identified mining and quarrying activity, and strengthening the co-ordination between, Town Planning Department and Islands’ Coastal Zone Management Authority are issues requiring immediate attention. Re-examination of fees for development or re-development in urban, sub-urban and rural areas is necessary. Levying of “Environmental Cess” for degradation of environmentally sensitive areas, or evasive proposals treating it as a ‘continuous offence’ may be thought off.



LEGEND

- Port Blair Municipal Area
- Slums Area / Pockets
- P B P A Boundary
- Municipal Boundary
- Village_Boundary
- Ward_Boundary
- Roads



PROJECTION SYSTEM : UTM
 DATUM : WGS84
 SPHEROID : WGS84
 ZONE : 46

Scale 1 : 30000	DRG NO DMP 6	N
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LOCATION OF SLUMS IN PORT BLAIR
MASTER PLAN FOR PORT BLAIR PLANNING AREA - 2028

CLIENT Andaman Public Works Department A & N Administration, Port Blair	APWD
CONSULTANTS School of Architecture & Planning Anna University, Chennai-25	

