Chapter-III

STUDY AREA

3.1. INTRODUCTION

The Andaman and Nicobar Islands were constituted into a Union Territory in November 1956, and are located in the Bay of Bengal, mid way between peninsular India and Myanmar. These islands are located between 6º 45' and 13º 41' North latitudes, and 92º 12' and 93º 57' East longitude and spreading like a broken necklace in the North-south direction. There are 572 islands which can be distinguished into two groups geographically. Islands located north of 10º N latitude are known as Andaman group of Islands while islands located south of 10º N latitude are called Nicobar group of islands. Of the total 572 islands, only 39 islands are inhabited. The sandy beaches on the edge of oblique coastline are fringed with coconut trees that swing to the rhythm of the sea. Of the 306 named islands of this archipelago, large parts are designed as protected areas in the categories of 94 sanctuaries, four national parks, two marine national parks, one biosphere reserve (Great Nicobar Biosphere Reserve) and tribal reserved area. The land area of 6408 km² in the Andaman constitutes 88.2% as reserves and protected areas of which 36% is tribal reserve.

The Andaman has Indo-China affinities and the Nicobar has Indo-Malayan affinities (Ripley & Beehler 1989). The nearest land mass is ~1350 km away from west main land India, ~630 km east from Peninsular Malaysia, ~190 km South from Sumatran Coast. Andaman Islands are also home to four aboriginal tribes of humans in India, all of who still use bows and arrows and are struggle to safeguard their territories from the outside world. Islands tend to evolve a set of species endemic to them because of long isolation from other large land- masses. The rare flora and fauna, underwater marine life and corals, with crystal clear water and mangrove-lined creeks, offer a dream-view of the rare gifts of nature.

About 50% of the forests have been set aside as Tribal Reserves, National Parks and Wildlife Sanctuaries, which are inviolate. Luxuriant mangroves, perhaps the richest in the world, occupy most of the coastal belts of the Islands. Andaman and Nicobar Islands have 144 species of flowering plants and 75 species of land snails and birds like Narcondam
Hornbill *Aceros narcondmi* and Nicobar Megapode *Megapodius nicobariensis* which are not found anywhere else in the world (Hussain 1984; Sankaran 1995).

3.2. CLIMATE

The climatic conditions of Andaman and Nicobar Islands are similar to that of the Western Ghats of peninsular India and Sri Lanka. As all these areas lie in the tropical zone and experience high rain fall from the South-West and North-East monsoon. The proximity of sea and abundant rainfall prevents extreme of heat. During the S-W monsoon winds are moderate. There were no constant rainy days during the year, but sometimes Islands are exposed to cyclones with heavy rain and strong wind. Usually Northern part of Andaman Islands is exposed to higher amount of annual rainfall than Southern part of Andaman (DES 2009). During 2008 to 2011, North and Middle Andaman received high amount of annual rainfall in (2011 - 5361.3 mm) followed by South Andaman (2008 - 4152.6 mm) and Hutbay (2011 - 3350.0mm). The Andaman received highest rainfall in the September of 2011. The period of December to February is comparatively cool due to effect of North-Eastern monsoon. The warm weather extends from March to April with low precipitation. The average annual rainfall is 3000-3500 mm. Temperature ranges for 20 to 32 degree Celsius. So far, highest temperature received is in April’2010 (34.2 degree Celsius). Humidity varies from 60% to 85% (DES 2009).

3.3. LAND USE PATTERN

Most of the inhabited area is used for agricultural purpose or township area. In Andaman Islands, about 224 sq.km area is under cultivation (Paddy, Plantation, spices, fruits, vegetables, etc). Areca nut and Coconut are the main terrestrial crop (~103 sq.km), while paddy is the main food crop (120sq.km) followed by vegetables. Settlers of these Islands are cultivating vegetables in large quantity during particular season.
Figure 3.1: Annual rainfall of Andaman Islands during 2008 to 2011

Figure 3.2: Temperature variations of Andaman Islands during 2008 to 2011

(Source: DES 2009)
3.4. FLORA AND FAUNA OF THE STUDY AREA

Andaman and Nicobar Islands constitute one of the hot spots of biodiversity with a variety of ecosystems. The forests of the Islands are one of the richest in the country in terms of biodiversity and a large part of them are still unexplored. Insular nature and physical isolation of the Andaman and Nicobar Islands from main land is the reason for evolution of rare and distinct flora & fauna. The biodiversity of these Islands shows marked changes from one Island to another. Adjoining islands may have forest types of their own, and compositions of one island may not be same as the other.

The close proximity of Andaman and Nicobar groups of Islands to the equator and good amount of rain fall, in addition to rather fertile soil, have generally contributed to the formation of rich forests, both littoral and inland vegetation. The littoral vegetation includes mangroves, strand or beach forest and swamp or tidal forest. However, in Nicobar Island swamp forest is almost absent.
The flora of Andaman group of islands is distinctly different from that of the Nicobar group which is evident from the fact that the genera *Pterocarpus* and *Dipterocarpus* are common in Andaman Islands, are not found in Nicobar Islands. While the Melastomaceous genera *Otanthera* and *Astronia*, the Gesnariaceous genus *Cyrtandra*, *Stemonurus* of the Icacinaceae, *Bentinckia* and *Rhopholoblaste* of the Arecaceae, Spathoglottis of the Orchidaceae and many more species occurring in the Nicobar Islands are locally absent in the Andaman Islands. There is one endemic genus in the Andamans, namely *Pubistylus*. Endemic species in Andaman include *Ailanthus kurzii*, *Amoora mannii*, *Dichapetalum andamanicum*, *Mangifera andamanica*, *Planchonia andamanica*, *Pubistylus andamanensis* and *Strobilanthes glandulosus* (Thothathri 1962). The discovery of a wild relative of rice, *Oryza indandamanica* (Ellis 1985), indicates that the islands contain potentially important genetic resources. Sea grasses are also found along the coastal line of these islands. The long coastal line of Andaman and Nicobar Islands is 1962 km and it is one fourth of the Indian coastal line. The mangrove forest of Andaman are rich in species composition and highly diversified, about 60 mangrove species were reported from Andaman and Nicobar Islands, distributed among 27 families and 17 genera in the Andaman and Nicobar Islands. The species like *Avicennia officinalis*, *Bruguiera gymnorrhiza*, *Heritiera littoralis*, *Rhizophora apiculata*, *Rhizophora mucronata* are very common species, but *Cynometra iripa* and *Xylocarpus gangeticus* are very low in abundance.

About 62 mammals are reported in the Andaman and Nicobar Islands. Of them, 32 species of them are endemic, including the Andaman Wild Boar *Sus scrofa andamanensis*. Rodents are the largest group with 26 species, followed by 14 species of bat. Among the larger mammals there are two endemic subspecies of wild boar, *Sus scrofa andamanensis* from Andaman and *S. s. nicobaricus* from Nicobar, which are protected by the Wildlife Protection Act 1972 in schedule- I. Most of these mammals are understood to have been brought it from outside and are now considered endemic due to their prolonged insular adaptation. 301 species of butterflies in 116 genera, five families and three sub families were identified in Andaman and Nicobar Islands. Out of them, 136 species are seen only in Andaman and 100 species are seen only in Nicobar group, and remaining 65 are seen in both Islands (Ferrar 1951; Khatri 1989). Birds are another group of fauna with good diversity in this archipelago. There were 259 species (297 species and subspecies) reported from these
Islands by various researchers (Abdulali 1964; Sankaran & Vijayan 1993; Yahya & Zarri 2002a; Pande et al. 2007; Rajamamannan 2010; Rajan & Pramod 2011).

3.5. INTENSIVE STUDY AREA

Andaman Island is a group of big and small picturesque islands in the form of narrow broken arc which is in north-south in direction. Andaman Island group consists of four large islands such as Little Andaman, South Andaman, Middle Andaman and North Andaman. Of these, South, Middle and North Andaman Islands are located very closely and divided by about 100 meters wide sea between them. Richie’s Archipelago located in Andaman Sea and Little Andaman is located 120 km south of South Andaman. The present study was carried out in the ten islands of the Andaman group, which include Little Andaman, South Andaman, Ross Island, Baratang Island, Middle Andaman, North Andaman, Interview Islands, South Button Island, Neil Island and Havelock Islands. Of these, seven Islands are inhabited. These ten study sites were clubbed into five groups. The five clubbed groups are Little Andaman Island, South Andaman Islands includes Ross Island, Middle Andaman Islands (which include aratang and Interview Island), North Andaman Islands and Richie’s Archipelago (which include Havelock, Niel and South Button Islands).
Figure 3.4: Map of Andaman Islands (Source: www.maps.google.com)
3.5.1. Little Andaman Island

Little Andaman Islands is located between 92º21' to 92º38'E Longitude and 10º28' to 10º54' N Latitude and 120 km away from Port Blair by ship route, but only 68 km distance between South and Little Andaman Islands. Population is 17528 as per the 2001 census and total area is 734.39 sq.km. Of the total area, nearly 700 sq.km area is under reserved forest cover, all other area is inhabited. The main plantations in the inhabited area were Areca nut *Areca catechu*, Coconut *Cocos nucifera*, Red Oil Palm plantations. Little Andaman is long isolated from all other Islands in Andaman and Nicobar Islands and south 10 degree channel separating this Islands from Nicobar Group. Dugong Creek is located here and it is the only place where the aboriginal tribes Onges’ settlement. This Island is also famous for Red Oil Palm Plantation, which spread over an area of 15.93 km². The main villages are Hutbay, Rabindra Nagar, Vivekanandapur, Ramakrishnapur, Herminder Bay and Dugong Creek.

![Figure 3.5: Little Andaman island with survey points](image)

Figure 3.5: Little Andaman island with survey points
3.5.2. South Andaman Island

South Andaman Island is the most populated island in the Andaman and Nicobar group of Islands located between 92°30' to 92°59'E Longitude and 11°27' to 12°16'N Latitude. Port Blair is the only urban area 1347.7 km² in these islands. More than 65% area is under the thick canopy cover because of Jarawa reserved area in Northern part and Mount Harriet National park in Eastern side of Andaman. Southern parts are mostly settlement areas with high population and most of the people in Port Blair area are Government servants. As per 2001 census, the South Andaman Island population was 1,81,949. Mount Harriet National Park, Chidiyatapu Biological Park and Mahatma Gandhi Marine National Park, Wandoor are some of the notable protected areas in this Island. Second highest peak in Andaman is located in Mount Harriet National Park. This area has thick evergreen vegetation which is a good place for birding, butterflies watching and trekking. The capital of Andaman and Nicobar Islands is located in the South Andaman and it has all Government office head quarters including Navy, Air force and Army stations. Ross Islands is ~1km away from Port Blair and it is the place where British penal colony was situated.

![Figure 3.6: South Andaman Island with surveyed points](image)
3.5.3. **Middle Andaman Islands**

Middle Andaman Island group is located between 92° 38' to 93° 00'E Longitude and 12° 03' to 13° 00'N Latitude. Middle Andaman Island is the largest islands (1535 km$^2$) in the Andaman and Nicobar Island. Baratang Island (297 km$^2$) and Interview Island (133 km$^2$) are also included in the Middle Andaman group in the present study. The South-west part of Middle Andaman is also reserved area for aboriginal tribes “Jarawa” other than Jirkatang to Middle Staright area. As per the 2001 census, the population is 54385 peoples residing in 101 revenue villages, the main places in this island are Kadamtala, Rangat, Betapur, Billy ground and Mayabunder. But 1535 km$^2$ area is under reserved forest (mainly deciduous forest) and 82.61 km$^2$ under cultivations. Baratang is situated south of Middle Andaman and this Island is connecting South and Middle Andaman Islands. Baratang Island has nearly 283 km$^2$ under protected forest and onegood tourist spot (Limestone Cave and Mud Volcano) in the Andaman. Interview Island was declared Wildlife Sanctuary and has only forest camp and one police outpost. This island has good evergreen forests includes inland and mangrove patches, land of feral elephants, birds and butterflies.

![Figure 3.7: Middle Andaman Island with survey points](image)

3.5.4. **North Andaman Islands**
North Andaman Island is located between 92° 40’ to 93° 08’E Longitude and 12° 52’ to 13° 36’N Latitude, population is 42163 as per the 2001 census in 1375.99 km² area. Of the total area, 87.5 km² is under cultivation and settlement (Island wise statistical Outline, 2008). Diglipur is the heart of the North Andaman with most of the population and market. Panighat bridge connects between Middle Andaman and North Andaman Islands. According to Statistical department of Andaman and Nicobar islands, there were 68 inhabited villages including 30 revenue villages and 34 forest encroached villages. Southern part of North Andaman Islands still has good forest areas. The highest peak (738m) and only one Hydroelectric Power plant (Kalpong) in the Andaman and Nicobar Islands is located in this Island. Coral reefs in the Northern coastal area of this Island is exposed above the water due to 2004 Tsunami tilts of the Andaman and Nicobar plate.

![Figure 3.8: North Andaman Island with survey points](image_url)
3.5.5. Ritchie’s Archipelago

Ritchie’s archipelago is located (92° 54' to 93° 10'E Longitude and 11° 48' to 12° 15'N Latitude) East of South Andaman Islands and geographically 18 km away from North of South Andaman Island. It comprises of a cluster of small Islands, Havelock and Neil Islands are the main inhabited islands in this archipelago. Havelock Island is the biggest Island in this group with 113.93 km² area and five villages with population of 5354 (2001 census). Neil Island is small, 18.9 km² area with 5 inhabited villages and population is 2868 (2001 census). Of the total area of archipelago only small area is under the forest (6.47 km²), however Havelock Island has more than 75% under the thick forest.

Figure 3.9: Richie’s Archipelago with survey points