Pressure on the Ecosystem and Land at Andaman and Nicobar Islands

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Introduction

The Andaman and Nicobar Islands, a Union Territory of India is the largest archipelago in the bay of Bengal with a geographical area of 8249 km^2. It comprise of 572 islands, reefs and rocks covering 8249 km^2. The coastline extends to 1962 km. Situated between 6^0N to 14^0N latitudes and 92^0E and 94^0E longitudes. The Andaman and Nicobar Islands are bestowed with varied sheltered coastal habitats. It is a store house of unique flora and fauna, showing great diversity and high level of endemism.

Both these island groups are a distinct ecoregion and are classified as one of the 12 bio-geographical zones of India. (Rajamamannan, 2012). The islands are the summits of a mountain range atop the great tectonic zone that extends from the Eastern Himalaya along the Arakan Yoma of lower Myanmar in the north, to Sumatran and the Lesser Sundas in the south. (Alfred *et al.* 2002).

The major land use in these islands is forests occupying 6662 km^2 forming 80.76% of the land area (FSI, 2009). The other major land uses are agriculture, horticulture and housing. The island ecosystem is unique with a rich mosaic of tropical evergreen forests, deciduous reefs and sea grass beds. The ecosystem and land management is under pressure from increasing human and cattle activities. The paper highlights pressure on the ecosystem and land at Andaman and Nicobar Islands.

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I. The pressure on ecosystem

a. **Extraction of non-timber forest products** - Pressures on the ecosystem remains on forests for extraction of non-timber forest produce like the poles, ballies, bamboos, posts, thatching leaves and canes, with affects the regeneration of the forests. The ballies, poles and posts are all in fact the advance growth required for forest regeneration and if these are removed the growing stock would be depleted.

b. **Encroachments** -The major pressure on the forests is from encroachments and the situation is the worst in North Andaman, where the forests are pock-marked by encroachments. These encroachments have not only resulted in destruction of timber of commercial value but also diminished the ecosystem functions of the forests, by their fragmentation. The forested land is a source of useful forest produce that sustain many livelihood patterns. Villagers know this and are aware of the effects of deforestation. In spite of this, encroachment in forest area continuous without much control, as there is a great demand for living space. The Government decided to regularize all encroachments made prior to 1978 and accordingly 1367 ha of forest land was dereserved for the purpose in 1989. Encouraged by the regularization of encroachments, more people have encroached the forests and these illegal occupations after 1978 extend over nearly 3500 ha. The consolidation and expansion of these encroachments has been facilitated by provision of infrastructural facilities like roads, water supply, electricity and schools even in illegal occupations, by the development departments working at cross purposes with the objectives of forest conservation. The Supreme Court in 2002 directed removal of all the encroachments from forest area, but they are yet to be removed. (Jayaraj and Ravichandran, 2012).

c. **Coral reefs**–Coral reefs are underwater structures made from calcium carbonate secreted by corals. Coral reefs are colonies of tiny animals found in marine waters that contain few nutrients. The coral reefs are under pressure due to excessive fishing, tourism activities, collection of corals, sedimentation from the soil erosion, leaching of fertilizers and pesticides from the agricultural land, pollution

from the sewage discharged into the sea, dumping of solid wastes and debris into the sea, plastics that come down to the sea through storm water drains, water pollution from ship' ballast water, warming of the sea, and predation of corals by other animals. (Jayaraj and Ravichandran, 2012).

d. **Mangroves**-The mangrove forests are often called "tidal forests", coastal woodlands" of "oceanic forests". They are marvel of nature, ecological wonder and scenic splendour with arching foots, breathing roots, salt vomiting leaves and mud dancing fishes and breath-taking beauty. They are of great environmental significance and socio-economic value as they are: (i) protecting shores from wind, waves and water currents, (ii) preventing soil erosion and siltation, (iii) protecting coral reefs, sea grass beds and shipping lanes, (iv) supplying wood and other forest products, (v) providing habitats and nutrients for a variety of organism and (vi) supporting coastal fisheres and livelihoods (Kathiresan and Bingham, 2001; Kathiresan and Qasim, 2005).

Mangrove in India are spread over an area of 4,639 sq. km^2, occupying only 0.14% of the geographical area of the country (FAO, 2007). Above 13 % of the Indian mangroves are located in Andaman and Nicobar Islands, where many tidal estuaries, small rivers, neritic islets and lagoons support a rich mangrove flora.

The mangroves in Andaman and Nicobar Islands are under pressure from natural as well as anthropogenic threats. The impending sea level rise, storm surges, cyclones, tsunami, soil erosion and sedimentation from the slopes, movement of people, cattle and watercraft through the mangrove areas, illicit felling of mangrove wood for fuel and charcoal making, grazing by cattle, occupation of mudflats and mangrove areas for crab fattening, reclamation of mangrove areas for coconut cultivation and fishing activities inside the mangrove creeks are various threats faced by the mangroves.

II. Pressures on land

a. **Agriculture** - Pressure on land is mainly for agriculture and the cultivated crops are mainly paddy and coconut. The land in these islands is unsuitable for agriculture, because of the undulation terrain and shallow soil, which gets easily washed away in the torrential rains. Looking at the dense vegetation and the gigantic trees, the productivity of the land was overestimated, overlooking the fact that the nutrients in tropical forest ecosystem are held in the vegetation and not in the soil. Once the vegetation is cleared and burnt, which usually precedes cultivation, there is good yield which gradually reduces and becomes uneconomical in the long run leading to expansion of fallow lands. Those affected by loss of productivity, encroach upon the nearby forest and go for another cycle of clearing and burning.

b. **Habitation** - The increasing population is urbanized, migrating population is urbanized, migrating and settling down at Port Blair. Along with the growth of city, slums also grow around Post Blair. Urbanization also leads to a net work of infrastructural facilities, such as roads, pipelines, electricity lines, drainage and increased commercial activities, which result in large volume of goods flowing in to the city, exerting further pressure for disposal of waste generated. Port Blair generates 76 MT of solid wastes per day and has the highest per capita waste generation in the country, amounting to 0.76 kg per capita per day (EQUATIONS *et al.* 2008).

c. **Tourism** - Tourists activities in the islands have also led to serious threats to the environment. For one, the infrastructure required to service the growing number of tourist, especially airports, hotels and roads. Besides increase in number of tourist, means an increase in energy consumption, in pollution because of transport in inadequate waste management. This rapid growth in human population has adversely affected the natural ecosystems of the islands. (Curson 1989, Andrews and Sankaran 2002). In the absence of large industries, the commercial activity is more focused on services, especially tourism. Tourism, which has to be largely nature based in these islands, in view of the natural wealth they have, can erode this base itself, if not regulated. It has been estimated that for every 100 persons in the islands, there are 3 tourists, and for every 100 persons in Port Blair there are 100 tourists, exerting additional pressure on the resources of the islands. Tourism in these

islands being based on the beaches, there is pressure on coastal land for building resorts and tourist amenities. Tourism is exerting pressure on water resources also, and it has been estimated that the water consumption by the hotel industry is approximately 2,75,000 litres per day, which is double of the domestic consumption, (EQUATIONS *et al.* 2008).

d. **Coastal erosion due to sand mining-** Major threats to marine and coastal biodiversity include sand mining on the sandy beaches and siltation of coastal areas. Increasing population and accelerated development have spurred the growth of construction activity. The cement used for construction requires sand to be mixed with it to make concrete and, as the islands do not have large streams from which the sand can be collected, most of the sand is mined from the coastal areas. To facilitate sand extraction from beaches, a temporary CRZ waiver has been authorized by the Central Ministry for Environment and Forest. A Sand Allocation Committee has also been established in Andaman and Nicobar Islands, but surveillance and enforcement are difficult, there is extensive illicit collection, leading to rampant erosion.

e. **Introduction of alien species-** The intro-duction of alien or exotic species has had adverse impacts through their unchecked proliferation, for example the Spotted Deer, which were originally introduced for sport. In the absence of natural predator, they multiplied extensively. The deer now has become pest as they browse indiscriminately and prevent regeneration in the protected areas. Abondoned after forest operations the feral elephants are also causing damage in some PAs. The introduction of hardy and adaptable birds like common mynah is a threat since they compete more vulnerable indigenous species. (Source: Sustainable Management of Protected Areas in the Andaman and Nicobar Islands – Harry V. Andrews and Vasumathi Sankaran.)

Conclusion

Several developmental plans are proposed for the Nicobar Islands, these will irrevocably damage the island ecosystem and cause immediate loss in the biodiversity of the islands as they are much too small to sustain the impact of such activities. The presence of high species density and occurrence of many threatened species shows the need for continued protection and preservation of land and ecosystem at Andaman and Nicobar Islands.

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