COMMENTARY

A voice for the Great Nicobar Island, India

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The Andaman and Nicobar Islands are important centres of endemic biodiversity in India. They have been the home to primitive human tribes for thousands of years. The southernmost Great Nicobar Island is known for its biogeographic affinity to Indonesia. A large part of this island is a biosphere reserve recognized by UNESCO. A plan to urbanize a part of this island after clearing lush tropical rainforests has been a matter of concern. While development is not altogether a bad idea, it has to be done with greater sensitivity towards the fragile ecosystem of the small island and its original inhabitants. The vulnerability of this island and an alternate model of development are discussed here.

The Andaman and Nicobar Islands are among India's most important centres of endemic biodiversity. They have immensely contributed to India finding a place among the world's megadiverse countries. Historically, the Islands have also been home to 14 primitive human tribes, the majority of which represent the Negrito race[1]. There seems to have existed a pre-historical divide in the geographical distribution of the endemic tribes; the Negrito tribes being confined to the Andaman Islands and those representing the Mongoloid race to the Nicobar Islands. Nearly 30 years ago, when I had the first opportunity to visit the Islands, the number of extant tribes was only six[1].

The Andaman and Nicobar Islands are geographically quite distant from mainland India. They are in the form of a narrow 'steppingstone-like bridge' running north–south between Myanmar and Sumatra. The Great Nicobar Island assumes greater biogeographic significance as it lies at the southern end of the chain of islands, and its biodiversity shows more affinity to Indonesia than to Myanmar or the Indian mainland. A major part of the Great Nicobar Island was declared a 'biosphere reserve' in the early 1990s under the Man and Biosphere Programme of the Government of India[2]. In 2013, it found a place in UNESCO's list of globally recognized biosphere reserves.

The Great Nicobar Island has been in the limelight during the past couple of years due to widespread fears that a mega-development project focused on urbanizing a part of the island will irreversibly affect its fragile ecosystem. I do not wish to dwell on the specific details of the project as there is plenty of information in the public domain. However, I would like to draw attention to a detailed map published by the Environmental Justice Atlas that explicitly presents the master plan. The map can be easily accessed through the internet. The most significant parts of the project are an integrated township, an international airport and an international seaport in decreasing order of the area allocated for each. It may take 30 years for the project to be completed. The matter of utmost concern is that 130 km^2 of the total area (166 km^2) required for the proposed project is obtained by clearing lush tropical rainforests, including an estimated one million trees[3]. There are also concerns that the project, when implemented, will lead to the permanent displacement of the remnant Nicobarese and the endemic Shompens[3].

Here, I highlight through personal experience that development projects can be implemented with minimal adverse impacts if there is proper planning and an understanding of the locality's past and present ecology. Development projects are sustainable when designed and implemented with sensitivity towards the native humans who have lived there for thousands of years and the overall carrying capacity of the ecosystem. Sustainable development is central to global conservation initiatives such as UNESCO's Man and Biosphere Programme, UN Convention on Biological Diversity and UN Sustainable Development Goals.

Regarding the Great Nicobar Island, there are still a lot of grey areas in the scientific understanding of its fragile ecosystem. Like the rest of the Andaman and Nicobar Islands, the Great Nicobar Island is part of a unique tropical forest ecosystem lacking large mammalian carnivores. The top predators are mainly reptiles such as the saltwater crocodile, reticulated python and possibly the water monitor. Though large, birds of prey like the white-bellied sea eagle and crested serpent eagle are somewhat specialized in their dietary habits and may only play a limited role as top predators. It is, therefore, important to uphold the fact that the native tribes have, for thousands of years, complemented the large reptilian predators in structuring and sustaining the fragile ecosystem of the island. Decline in the population size and home range of native tribes will certainly affect the structure and functioning of the island ecosystem in the long term.

According to the master plan of the project, the area where it will be executed partly overlaps with the biosphere reserve. This can be seen in the map published by MONGABAY India, which is also available on the internet. The biosphere reserve consists of two protected areas – the Campbell Bay National Park in the north and Galathea National Park in the south[2]. Except for the northern end of the project area that overlaps with the northeastern part of the biosphere reserve, the rest of the 166 km^2 runs along the southern coast. The southern coast have their share of unique freshwater biodiversity and littoral forests (including *Pandanus*) that will be permanently lost. Fruits of the *Pandanus* shrubs (or trees) are an important source of food for the Shompens[3] and the long-tailed macaque (crab-eating macaque[2]). The mangroves along the creeks, the seagrass meadows and coral reefs are also vulnerable. Seagrass meadows are the primary foraging habitats for the endangered dugong. The intervening beaches are also critical habitats where another endangered species, viz. the leatherback turtle nests. The leatherback turtle, the largest of sea turtles, is not known to nest anywhere on the Indian mainland, and it is 'charismatic' to the island's settlers who ceremonially await, often foregoing a night's sleep, for its arrival on the beach year after year during the nesting season.

The adverse impacts of urbanization are not likely to end with the implementation period. There will be several unforeseen repercussions that will follow. This is mainly because the Great Nicobar Island is not

large. Relative to its size, it has a long coastline, which makes it vulnerable to sea-level rise and other vagaries of the tropical maritime climate. This will force residents (and other establishments) close to the shore to move further inland as and when the situation demands. Such inward movement of people and establishments will add further pressure to the remaining natural habitats on the island, especially those within the Galathea National Park, as the project area is close to it.

Against this backdrop, the best option would be to pause and revisit the proposed project. Many sustainable alternatives to small island development can be explored without hurrying through with a predetermined plan of work. International tourism is certainly a good option for generating revenue. In fact, the master plan shows that about 60 km^2 of the project area has been dedicated to tourism – ecotourism and coastal tourism. Tourism in any form has to be implemented with sensitivity if it has to be sustainable[4]. If tourism can be combined with research, it will make it more sustainable and rewarding. I, therefore, suggest that at least a part of the island (if not the entire biosphere reserve) be developed into a 'nature monument' with basic infrastructure, similar to the Barro Colorado Island maintained by the Smithsonian Tropical Research Institute in Panama. This 15 km^2 well-maintained island has contributed enormously to our understanding of tropical rainforest ecosystems and their dynamics during the 100 years of its existence as an international facility for research. It is also a popular tourist destination in Panama, attracting both natives and foreigners throughout the year.

At a time when large carnivorous mammals are becoming scarce everywhere or are not being tolerated, more and more ecosystems are 'reorganizing' themselves to function with only the services of smaller predators. Research in the Great Nicobar Island will shed more light on the intricacies of such ecosystems. The outcome of such research will find wide application in the restoration of tropical ecosystems throughout the world, which will add to the resilience of the earth's biosphere – the ultimate goal of humankind. Further, international research shows that tourism can be a good means of generating the much-needed revenue to sustain the fragile island ecosystem and its people with the required levels of sensitivity. Nicobarese men and women, with their rich traditional ecological knowledge, can be trained as tourist guides, and thus, they can be reassured of their rightful place on their native island[5]. The Shompens can continue to hunt and gather peacefully in their native homes. With India emerging as a role model to the rest of the world, a well-executed small island development model will certainly add another feather to its cap.

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