EXECUTIVE SUMMARY

REPORT OF THE COMMISSION SET UP UNDER ORDERS OF THE SUPREME COURT ON THE STATUS OF FORESTS AND OTHER ALLIED MATTERS IN ANDAMAN AND NICOBAR ISLANDS

SHEKHAR SINGH

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PREFACE

This report has been prepared under the directions of the Supreme Court of India, in a short period of 7 weeks. Consequently, it suffers from many of the shortcomings that a hurried process has. Also, because of the shortage of time, the report focuses mainly on the Andaman group of Islands. This is also because they have far greater problems related to forest working and other adverse environmental impacts, than the Nicobar group. The shortage of time also prevented a visit to the Nicobar islands, though I have visited them earlier for other purposes.

In the preparation of this report I have been greatly assisted by the help and cooperation of the Lt. Governor of the Andaman and Nicobar Islands, Shri NN Jha, and by other officers of the A&N administration, especially of the forest department. I would particularly like to acknowledge my gratitude to Shri SS Patnaik, Principal Chief Conservator of Forests, Shri PV Savant, Chief Conservator of Forests, Shri DV Negi, Conservator, Shri Khazan Singh, Chief Wildlife Warden, and Shri RSC Jayaraj, DCF, all of the Andaman and Nicobar Islands Forest Department.

Thanks are also due to Dr. Rauf Ali and Dr. Harry Andrews of the Andaman & Nicobar Environmental Team (ANET), to Dr. Ravi Sankaran of SACON, and to Shri Samir Acharya of SANE. I am particularly grateful to all the individuals, groups and associations who took the trouble and found the time to meet with me during my two visits to the Islands,

On the mainland, I benefited much from interactions with Shri JC Daniels and Shri Debi Goenka of the Bombay Natural History Society. I was also fortunate enough to meet some other members of the Society and have detailed discussions with them. Shri Pankaj Shekhsaria and Shri Ashish Kothari of Kalpavriksh also provided much useful information and ideas.

Officers of the Ministry of Environment and Forests, Government of India, especially Shri MK Jiwrajika and Shri AR Chadha, were also very helpful and forthcoming with information and advice, as were officers of the Planning Commission, Ministry of non-conventional energy and the Forest Survey of India.

Finally, I owe a large debt to my colleagues at the IIPA, especially Shri Raman Mehta, Ms. Vishaish Uppal, Shri Arpan Sharma, and Shri Harish Sharma, two of whom accompanied me to the islands and all of them toiled day and night to complete this report in time.

Shekhar Singh
New Delhi

30 January, 2002

I. PREAMBLE

Consequent to the order of the Supreme Court, on 26-11-2001, the Ministry of Environment and Forests issued an order on 6-12-2001 (No. 13-19/2001-SU) appointing me a Commissioner to give a report on the state of the forest and other allied matters of the Andaman and Nicobar Islands (copy of order at annex 1).

Accordingly, I made two visits to the Andaman and Nicobar Islands (ANI), the first from 16 to 21 December, 2001, and the second from 16 to 19 January, 2002. Apart from Port Blair, I also visited and held meetings in South, Middle and North Andaman during the first visit, and in Little Andaman during the second visit. In all, 33 public meetings were held and representatives of 52 groups were met (Summary of oral submissions at annex 2; copies of written submissions in Volume III). Meetings were also held with the Lt. Governor, other government officials, scientists, NGOs and with the petitioners (Detailed itinerary enclosed as annex 3)

I also travelled to Mumbai to have a meeting with representatives of Kalpavriksh and the Bombay Natural History Society (BNHS), two of the petitioners, on 24 December, 2001 and met with the Minister and officials of the Ministry of Environment and Forests, Government of India, on 4 January, 2002.

II. STRUCTURE OF THE REPORT

The report, along with the annexes and maps are in Volume I. The conclusions and main recommendations are summarised at the start of the report.

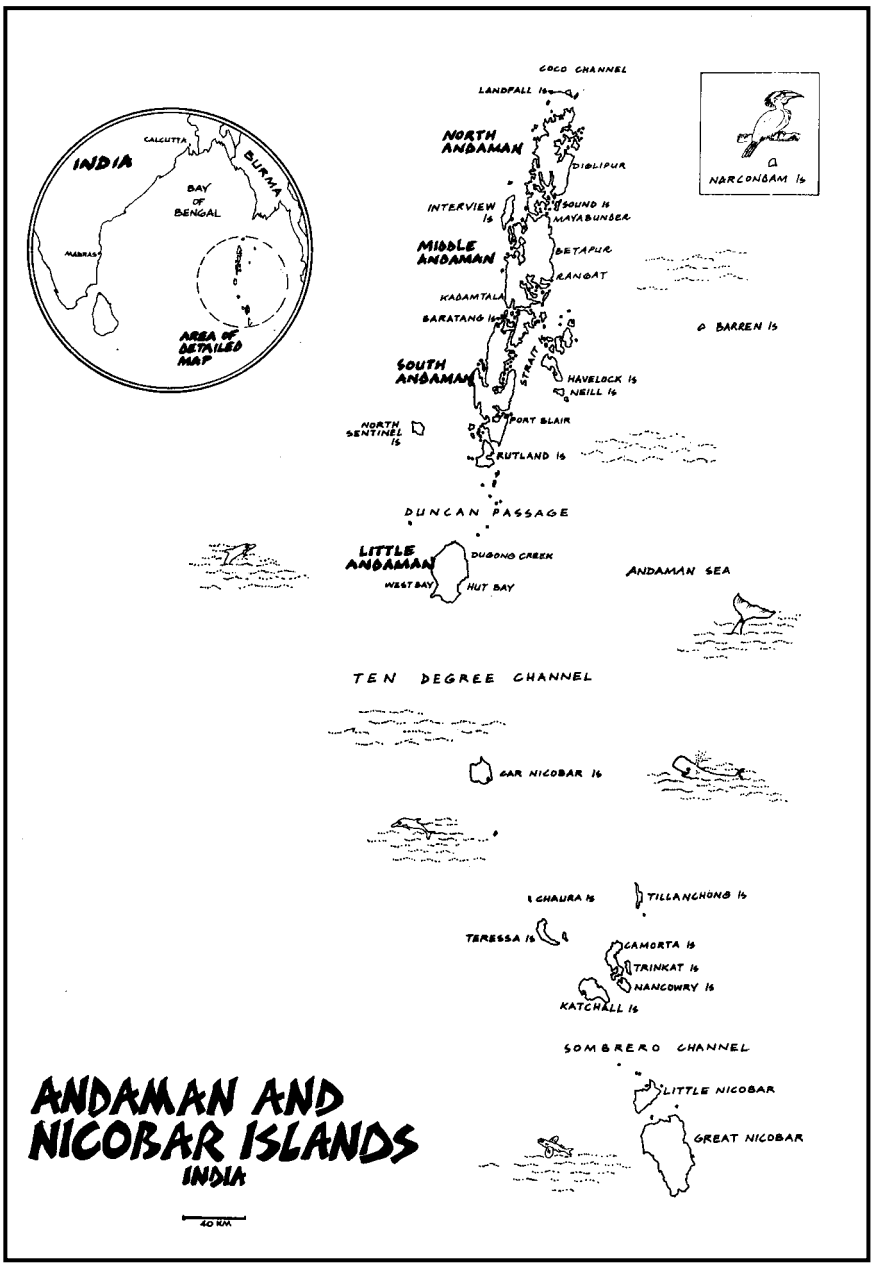
Volume II contains copies of the data that were sent by the Andaman and Nicobar (ANI) administration, copies of the memoranda submitted by the ANI administration, the Member of Parliament from ANI, the ANI Forest Plantation and Development Corporation (ANIFPDC), the various petitioners and the forest workers union. It also contains copies of various documents relied upon as a part of this study, the correspondence with various government departments and a list of people who made oral submissions during the ANI visits.

Volume III contains copies of all the other petitions and memoranda received while visiting ANI.

(NOTE: THIS VERSION DOES NOT CONTAIN THE ANNEXES AND OTHER MATERIAL> IT CONTAINS ONLY THE TEXT OF THE REPORT).

III. PROFILE OF THE ISLANDS

Location and Area: The Andaman and Nicobar group of islands is situated in the Bay of Bengal, between peninsular India and Mayanmar. It is located between 6^0 45" and 13^0 41" North latitudes, and 92^0 12" and 93^0 57" East longitudes. Arranged in an arc from the north to the south, there are 349 islands, which can be distinguished into two groups geographically. Islands located north of 10^0 N Latitude are the Andaman group of islands while the rest belong to the Nicobar group.



The northernmost point (Land-fall island) is about 901 km away from the mouth of Hoogly River and about 190 km from Myanmar. The southernmost island is Great Nicobar, whose southern most tip is only about 150 km away from Sumatra, Indonesia. The Capital of the Andaman and Nicobar Islands is Port Blair, which is 1255 km from Kolkata, 1190 km from Chennai and 1200 kms from Vishakhapatnam. The Union territory has two districts viz. Andaman and Nicobar.

There are 325 islands in the Andaman group while the Nicobar group has 24 islands. Total geographic area of Andaman and Nicobar Islands is 8249 sq. km., of which, the Andaman group of islands cover 6408 sq. km., while the Nicobar group covers 1841 sq. km. The recorded forest area is 7170.69 sq km (86.93%) and the actual forest cover is 7606 sq km (92.2%).

Out of the total 349 islands only 38 islands are inhabited, 24 in the Andaman group and 12 in the Nicobar group.

There are 547 villages in this Union Territory, of which 504 are inhabited and the remaining 43 are uninhabited. Of these, 355 villages (334 inhabited and 21 uninhabited) are in Andaman district and the remaining 192 villages (170 inhabited and 22 uninhabited) are in the Nicobar district. [District Census handbook of Andaman District, 1991]

Geography and Geology: These islands are the summits of a submerged mountain range lying on the great tectonic suture zone extending from the eastern Himalayas along the Mayanmar border to the Arakan and finally Sumatra and Lesser Sundas.

The physiography of these islands is characterised by undulating topography and intervening valleys. There are, however, some flat islands like Car Nicobar and Trinket.

There are no major perennial fresh water rivers in these islands except Kalpong in North Andaman and Alexendra, Dagmar and Galathea rivers in Great Nicobar. There are several rain fed streams, which dry up during summer. The coastline of these islands forms a large number of bays, lagoons and serpentine creeks, and

has a length of about 1962 km. At several places tidal creeks penetrate far inside the land and form outlets for fresh water streams.

Two islands of volcanic origin are found here- the Narcondum and the Barren Islands. The former is now apparently extinct while the latter is still active. [Andaman and Nicobar forest Department Report]

Soil: Soil cover is rather thin, varying from 2m to 5m. It is mostly alluvial on hilltops while diluvial in ridges and valleys. The coastal flats have an admixture of sand, silty clay and diluvial material with fine fragments of coral lime. The soil is, in general, mild to moderately acidic with high humus on top. [Andaman and Nicobar forest Department Report]

Climate: These islands have a tropical climate, which is warm, moist and equable. The temperature ranges from 18^0 C to 34^0 C. The proximity of the sea and the abundant rainfall prevent extremes of heat. An average of 3000 mm per year is received from southwest and northeast months. Humidity is high varying from 66 to 85%. In normal conditions the wind speed is fairly constant (5 knots per hour) but during cyclonic weather it may go as high as 12 to 13 knots per hour. [Andaman and Nicobar forest Department Report]

Demography: The population of these islands as per the last three censuses is shown in the following table:

Population	**1981**	**1991**	**2001**
Andaman District	157,821	241,453	314,239
Nicobar District	30,433	39,208	42,028
Total	**188,254**	**280,661**	**356,265**

The table above shows that the population is growing at a rapid pace. This increase is mainly due to the immigration of people from mainland. The density of population in ANI is about 43 persons per sq. km (All India: 324). Population is mainly dominated by settlers from mainland. Tribal population constitute only 9.45% of the total population. Main occupations of people include agriculture, animal husbandry, fishing, forestry and plantations, construction, transport, trade and commerce. [Andaman and Nicobar forest Department Report and Census of India 2001]

IV. IMPORTANCE OF A&N BIODIVERSITY

The Andaman and Nicobar Islands are an internationally acknowledged hot spot for biodiversity. This is despite the fact that there have been very few intensive studies in these Islands and many of the species still remain to be discovered or identified. However, even the little that is known is enough to establish the very high biodiversity value of these islands.

The fact that these islands have a relatively small population and low population density, and that they are remote and difficult to access, makes them one of the last places in India where, with a little effort, biodiversity can be effectively conserved, and that too without serious adverse impacts on the local inhabitants.

ANDAMAN & NICOBAR ISLANDS BIODIVERSITY AT A GLANCE

•Plant diversity:
–About 2500 flowering plants described
–14% (223 spp.) are endemic- found no where else in the World - and 40% of non-endemics have only extra-Indian distribution
•Animal diversity:
–5100 animals described (100 freshwater, 2100 terrestrial and 2900 marine)
–Coral reefs richest in India- 179 spp.
–Mammals- 52 spp of which 33 are endemic (63%), Birds- 244 spp of which 96 are endemic (39%) and Reptiles –76 spp of which 24 are endemic (32%) (Source: ANI Forest Department Presentation)

Animal Life

Nature has endowed these islands with a unique and varied animal life both on land as well as in sea. Faunal distribution in these islands is influenced by fauna of both Indo-Chinese and Indo-Malayan regions. Large mammals are absent in both Andaman and Nicobar Islands. Geographic Isolation of these islands has resulted in high degree of endemism. The surrounding seas are equally rich in marine biodiversity. Endemism is more pronounced in land animals.

Faunal diversity and endemism in A & N Islands

Animal Group	No. of special Subspecies	No. of Endemics	% Endemism
Terrestrial Fauna			
Mammalia	55	32	61.5
Aves	246	99	40.2
Reptilia	76	24	31.6
Amphibia	18	3	16.7
Mollusca	110	77	70.0
Arachnida	94	38	40.4
Hemiptera	146	22	15.0
Diptera	214	24	11.2
Coleiotera	878	92	10.5
Lepidoptera	426	52	12.2
Isoptera	40	19	47.5
Odonata	36	4	11.1
Annelida	30	9	30.0
Total	2,366	495	20.92
Marine Fauna			
Mammalia	7	-	-
Reptilia	12	-	-
Pisces	1,200	2	0.2
Echinodermata	350	4	0.4
Mollusca	1,000	18	1.9
Crustacea	600	6	1.0
Polychaeta	184	4	2.2
Anthozoa	326	2	0.6
Porifera	72	-	-
Meiofauna	490	102	21.0
Total	4,241	138	0.11

***Mammals*:** Out of 55 terrestrial and 7 marine mammal species reported so far, **32 species are endemic.** Common mammals found here are Andaman Wild Pig, Crab eating macaque, Andaman masked palm civet, Dugong, Dolphin, Whale, Spotted deer, Andaman spiny shrew, Nicobar tree shrew, Andaman horse-shoe bat, Lesser short nosed bat, elephant etc.

Birds: The rich avi-faunal diversity has always attracted ornithologists and bird watchers to these islands. As many as 246 species and sub species of birds are reported to inhabit these islands and of these **99 species and sub-species are endemic**. Some important species are Andaman Teal, Megapode, Narcondum hornbill, Nicobar pigeon, Green Imperial Pigeon, Nicobar Parakeet, Crested serpent eagle, White-bellied sea eagle, Edible-nest swiftlet, Emerald dove etc.

Reptiles: Sandy Beaches of these islands are famous for turtle nesting. There are 76 terrestrial reptiles. **Of these 24 species are endemic**. Important species include four main species of sea turtles viz., Leatherback turtle, Green sea turtle, Hawksbill turtle, and Olive Ridley turtle. Also found is the Salt-water crocodile, Water monitor lizard, Reticulate Python, sea snakes and many other varieties of snakes including King Cobra.

Corals: ANI are the richest of the Indian region in coral diversity with as many as 179 species covering 2000 sq km. Coral reefs are important breeding and nursery ground for fish and many other organisms and have been aptly called “The Tropical Rain forests in the Sea”.

***Marine Life*:** Due to its long coastal stretch, these islands have a very rich marine biodiversity. They harbour more than 1200 species of fish, 350 species of echinoderms, 1000 species of molluscs and many lower forms of life. Among vertebrates, dugongs, dolphins, whales, salt-water crocodiles, sea turtles, sea snakes etc. are

common. (Source: *Andaman and Nicobar Islands: Forests and Environment, Department of Environment and Forests, ANI Administration, March 2001)*

V. THE STATE OF THE FOREST AND OTHER ALLIED MATTERS

Given the unique biodiversity values in the Andaman and Nicobar Islands (ANI) and their extreme ecological fragility, the major objective of forest and ecosystem management in these Islands should be biodiversity conservation. The other objectives that need to be concurrently kept in mind are:

a. Protection of ecological services, like soil and water conservation.
b. Provision of timber and non-timber products for local use.
c. Protection of the habitat of the forest based tribals of the Islands.
d. Recreation.

The fact that ANI has a preponderance of evergreen and semi-evergreen tropical rain forests makes the conservation of forests from the point of view of both biodiversity and ecological services particularly important. Rain forests are not only the richest biodiversity pools in the world but are also very fragile. Most of the nutrients are in the vegetation and the forest litter and the soils are usually shallow. The slightest disturbance of the forest leads not only to significant loss in biodiversity but also to aggravated water runoff and soil erosion. The erosion of soil depletes the land and adversely affects the marine ecosystem, which receives the eroded soil. This is especially true of the ANI, where the topography is undulating and rainfall high. The fact that most forestry operations are carried out so as to finish just before the monsoons further aggravates the situation, as the soils that have been disturbed by the forestry operations do not have time to stabilise before torrential rains wash them out to the sea. Consequently, the coastal and marine ecosystem, including the very rich corals reefs and other marine life, gets badly affected.

The loss in floral biodiversity has an effect on the faunal biodiversity, affecting species of insects, birds, mammals, reptiles and others. This, in turn, also affects the coastal and marine biodiversity.

Keeping this in mind, the major threats to the forests and other ecosystems of ANI are outlined below.

A. COMMERCIAL FORESTRY

One of the major threats to the biodiversity of the forests of ANI is the stress on commercial forestry. For over a hundred years the forests have been subjected to increasing commercial exploitation. The forest department currently follows a "conversion" forestry system where natural forests are worked, commercial species extracted and the worked forests regenerated and managed in a manner such that there is a resultant preponderance of commercial species for future harvesting. In the process, biodiversity is destroyed deliberately. For example, the *Working Plan for The Forests of Little Andaman Islands (1999 to 2009)* states:

> **"Measures to Attain Special Objectives of Management:** It is Proposed to attain the special objectives of management by adopting a suitable natural regeneration technique, supplemented by artificial means wherever necessary, without any deterioration in the site quality, so that the natural forests of Evergreen, Semi-Evergreen and Deciduous types are converted into forest areas containing a higher percentage of more valuable timber species thus increasing the productivity and potential value of these forests. In such places where natural regeneration technique does not result in adequate stocking, it is augmented by dibbling/broadcasting of seeds of valuable species like padauk, gurjan, White Chuglam, Badam etc. and if necessary artificially planting seedlings from nursery stock."
> (Emphasis added. Written By Prakash M. Bhatt, IFS**,** Deputy Conservator of Forests,)

Similar passages are found in other working plans of the ANI forest divisions. What is surprising is that the Ministry of Environment and Forests (MoEF) is, even now, approving working plans with such objectives.

In some areas the natural forests have been totally cleared and replaced with plantations of padauk, gurjan, teak, or a combination of these and other commercial species (annex 4).

Forests were also leased out to the private industries and, from 1977, to the Forest Corporation, to fell and "regenerate". Though the practice of leasing forests to the private industry finally stopped in 1990-91, the corporation continues to directly fell and regenerate forests in Little Andaman and in North Andaman Islands.

Whereas this approach might have been in consonance with earlier thinking about forest management, for over two decades now the value of conserving biodiversity is well understood and accepted.

The forests of Andamans have been systematically converted from natural, biodiversity rich, forests to commercial "plantations" primarily to meet the raw material demand of the four medium sized wood based industries that were established in the Islands. These were:

a) WIMCO in South Andaman
b) Andaman Timber Industry (ATI) in South Andaman (Installed capacity 31,160 cum pa)

c) Jayshree Timber Products, Middle Andaman (28,300 cum pa)
d) Kitply Industries Ltd. in Middle Andaman (31,650 cum pa)

Of these, WIMCO closed down some years back and the Andaman Timber Industry and Jayshree Timber Products closed down recently, for various reasons, though prior to the Supreme Court order of October, 2001. Only Kitply Industries was still functioning when the Supreme Court ordered a ban on the felling and processing of all naturally grown trees.

These industries, apart from getting timber from the forests, have also been provided a handsome transport subsidy by the government, to bring in materials and to export their finished products.

The Ministry of Industry, Government of India, had sanctioned a Transport Subsidy Scheme for the wood based industries in the ANI from 1971. Under this scheme, 90% of the cost of transportation of raw material from the main land to the islands and 90% of the cost of transportation of the finished goods to the mainland was reimbursed to the medium and small-scale units by the ministry of Industry. This scheme was amended in 1993 to benefit wood based industries for a period of five years only from the date of commencement of commercial production.

This scheme was again amended, in 1995, and subsidy continued to be paid to the units, irrespective of size, beyond the stipulated 5 years, from March 1995 to March 2000. There is now a proposal to further extend this scheme for, it is argued, that such subsidies are necessary to ensure that employment is provided in the forest based industries. (Source: Note from the Planning Commission –copy at Volume II page 309).

It is interesting to note that while the three industries, ATI, Jayshree and Kitply, totally employed 1994 persons directly**,** in the last four years (1997-2001) they drew transport subsidies from the government of around Rs.15 crores, with an annual peak of over 5 crores in just 1999-2000 (For details, see Volume II, page 135-136).

It is questionable, therefore, as to how much, if any thing at all, they contributed to the local economy.

In fact, the Minutes of the Island Development Authority (IDA)[1] meeting of December, 1986, under the chairmanship of the then Prime Minister, record that:

> " Shri Romi Khosla stated that 75 percent of the timber extracted in the islands is used for plywood and match factories, and not for construction purposes. In fact, timber is not used at all as an economic base for durable assets of the Islands. ….Large factories are consuming large amounts of timber in ways which only destroy the inheritance. PM said that such industry should be shut down at the earliest…" (Proceedings of the first meeting of the IDA, 27 December 1986, para 14).
>
> In January 1989, again under the chairmanship of the then Prime Minister, the IDA decided that:
>
> "…wood extraction to feed the existing industries should be completely phased out in the next few years; if necessary, one should even import the wood needed" (Minutes of the Fifth Meeting of the IDA, January 1989, item No. 6, ix e)).

The then Inspector General of Forests (now re-designated as the Director General of Forests) visited the Islands in October 1989, and also recommended that:

> "Timber extraction in A&N Islands should be restricted to maximum of 1,15,000 cu.m. which is the current requirement and it should be further reduced in subsequent years by phasing out supply of timber to major wood base industries." (*Timber Extraction in Andaman & Nicobar Islands*, AG Oka, 1989).

Despite this, the Ministry of Environment and Forests and the A&N Administration, after affecting an initial decline in extraction levels from 1,23,678 cum in 1988-89 to 1,03,660 cum in 1990-91, again raised the level of extraction to 1,35,523 cum in 1994-95 (annex 5). Considering there was no subsequent decision of the IDA or the Prime Minister, reversing the earlier decision, it is not clear on what basis this was done. Fortunately, with the closing down of three of the wood based industries, the extraction levels have now come down.

[1] The IDA was constituted on 8th August, 1986 with the Prime Minister as the Chairperson. The members include the Finance Minister, Deputy Chairman of the Planning Commission and ministers of various other ministries (transport, tourism, planning, communications, defence, environment & forests, information and broadcasting, various officials and experts. The functions of the IDA are to (i) decide on policies and programmes for an integrated development of the Islands (ANI and Lakshadweep) keeping in view all aspects of environmental protection as well as the special technical and scientific requirement of the Islands, and (ii) review progress of implementation and impact of the programmes of development.

In addition, timber is also being supplied to the two government saw mills, one in Chatham, South Andaman (installed capacity 24,000 cum pa) and one in Betapur, Middle Andaman (5000 cum pa) (Source: ANI administration, copy at Volume II page 204).

Some of the timber sawn is being exported to the mainland. This is mainly sold in Chennai and Kolkata. The ANI administration maintains depots in these two cities for selling the timber it exports. However, the quantity of sawn timber exported by the administration has not crossed 1000 cum pa for the last 10 years and has fluctuated between 130.77 cum in 1998-99 to 868 cum in 1991-92 (Source: ANI administration, Volume II, page 152).

Locally, timber is used by small-scale sawmills, which numbered about 35 in 2001, with a total installed capacity of around 60,000 cum per annum and an operating capacity of about 25,000 cum pa (annex 6). In addition, there are also over 130 small furniture manufacturers using about 1600 cum of sawn timber (equivalent to about 3000 cum of logs) per year. Much of the timber processed by these two categories is for domestic use, though a small proportion (614 cum in 2000-01) is sent out to Chennai and Kolkata (annex 7).

Only the government saw mills are permitted to saw padauk, the major hardwood in the Islands. This is reportedly being done in order to prevent theft of padauk from the forests. However, as the government saw mills are located only in South and Middle Andaman, the availability of such hardwoods to the people in other parts of the Islands is a problem.

As a result of the commercial orientation of forestry in the Islands, at present nearly 60% of the exploitable forests (excluding the tribal reserve and protected areas) in South Andamans, Mayabandar and Baratang, have already been "worked" and exploited and, consequently, their natural profile significantly changed and their biodiversity value compromised, perhaps forever. Though the ANI forest department have stated that the total area of forests that they work is only 30%, this includes the area of the numerous outlying islands, mostly very small (see list of national parks and sanctuaries at annex 8). Given the nature of island ecology, the biodiversity values of the larger islands are much higher, by and large, than those of small islands of usually 1 sq km or less. Though this is an accepted scientific fact, the actual position in the ANI does not seem to have been studied in detail. The only study that could be found was by Dr Priya Davidar of the Salim Ali School of Ecology and Environmental Sciences. She states:

" ….forests on large islands are very important in the conservation of biodiversity. All the 47 species of forest birds and 57 species of butterflies (out of a total of 65 species recorded in this survey) were recorded on islands larger than 30 sq km in area. Islands smaller than 1 sq km had records of 36 species of forest birds and 39 species of butterflies. On islands smaller than 0.1 sq km, in area, only 20 species of forest birds and 21 species of butterflies were recorded" ('Conservation Priorities for the Andaman and Nicobar Islands', *Journal, Bombay natural History Society*, 93(3), December 1996, p 556 –copy at Volume II, page 277).

Therefore, though many of these small islands, which are in any case mostly inaccessible and therefore not economically viable to work, have been excluded from the "working circle", much of the larger islands, which are far richer in biodiversity, have been worked. Also, in terms of ecological services, like soil and water conservation, the larger islands are far more vulnerable as they are the ones where a majority of the population resides.

In all these areas the vast majority of non-commercial species have either disappeared or their composition been significantly changed. Though enough evidence of this exists, there appear to be very few studies documenting exactly what changes have actually occurred and what species have been lost or decreased in distribution and number. The two studies found dealt with just tree species. One is an unpublished MSc dissertation of Sonali Pandit, of the Salim Ali School of Ecology and Environmental Sciences, Pondicherry University, (*Regeneration of Important Rainforest Tree Species in Virgin and Selectively Logged Sites in the South Andaman Islands*, not dated). This dissertation was based on a field study of three sites in South Andaman, one that was undisturbed, and the other two that had been worked, of which one was regenerated from 1955 and the other from 1986. According to this study, there were major differences between the composition of the first, undisturbed, patch and the remaining two. Most notable was the fact that the undisturbed site had a predominance of rare, non-commercial species, while in the latter two these had almost disappeared and the preponderance was of commercial species (annex 9).

The second study, done by the Forest Survey of India (FSI) of the Ministry of Environment and Forests, Government of India, also suggested a similar decline in biodiversity (copy at Volume II, page 36-53).

During the second visit to Andamans, the forest department organised for me a visit to what was presumably a good regeneration site. This was a forest "regeneration" site of 1951, in South Andaman. This visit

also revealed that the regenerated area had a preponderance of commercial species and that the species composition had drastically changed from its natural profile (forest department report at annex 10).

Recommendations

Forest Harvesting

1) ***Felling of trees and collection of non-timber forest produce (NTFP) should be banned from the forests of Little Andaman Island and all tribal reserves except for i) collection of NTFP from already worked forests of Little Andaman and from forest areas designated for the purpose in the Nicobar group of Islands, for meeting the legitimate consumption of local inhabitants; and ii) collection of timber and other forest produce by tribals living within tribal reserves for meeting their bonafide needs.***
2) ***Harvesting of all forest produce including timber and NTFP should be completely prohibited from National Parks and Sanctuaries.***
3) ***In addition to areas covered under 1 & 2 above, no felling of trees should be allowed in any unworked forest area, i.e., area where felling of trees as per working plans, working schemes, felling schemes or approved working plans, has not taken place earlier. There should also be no diversion of forestland from any such unworked area or from areas covered under 1 and 2 above, without the specific orders of the Supreme Court.***
4) ***No felling of trees for whatsoever reasons or justification should be carried out to supply to, or to meet the raw material requirement of, plywood, veneer, blockboard, match stick or any other such wood based units except to local small-scale units (including saw mills) solely for meeting the local requirement for sawn timber and other wood based products.***
5) ***For meeting the timber and other forest produce requirements of inhabitants of the ANI, felling of trees from forest areas not covered under 1, 2 & 3 above, i.e., forest area worked earlier in accordance with working plans, working schemes, felling schemes or approved working plan and excluding areas falling within national parks, sanctuaries, tribal reserves, or Little Andaman, may be allowed. Such felling may be undertaken as per prescriptions of the working plans approved by the MoEF. These plans should also contain action plans for removing, in a phased manner, trees of commercial species that are in number or concentration in excess of what is found in a natural forest of the same type and similar location. Concurrently, efforts should be made to bring back the forest to its natural profile by encouraging /reintroducing those species of fauna and flora that naturally occurred in these forests prior to their being "converted". The working plan should also contain sufficient provisions for regeneration of felled areas. In accordance with an earlier Supreme Court order of 22nd September, 2000, felling of trees should be allowed only it sufficient financial provisions for implementing the working plan prescriptions have been made.***
6) ***In the meanwhile, the present ban on felling of trees may be continued and the local requirement of timber and other forest produce may be met by utilising the already felled trees and sawn timber lying with the forest department and the ANIFPDC.***
7) ***Once the stock of already felled trees and sawn timber is depleted, the local requirement of timber should be met, as far as possible, by harvesting the mono culture and mixed plantations of padauk, gurjan, teak and other species. The felling of trees from already worked natural forest, as specified in 5 above, should be undertaken only to meet the balance requirement. However, if the local requirement of timber and other forest produce is more than what could be obtained by felling of plantations and sustainably extracting trees from worked areas, as specified in 5 above, the same may be met by bringing timber in from other parts of the country. Under no circumstances should the over harvesting of the forest available for felling under para 5 above be permitted or undertaken.***
8) ***There should be no expansion of monoculture or commercial plantations on forestland. The existing plantations of oil palm, rubber and teak are reportedly no longer viable and should be phased out. The land so released should, in so far as it is forestland, be regenerated as specified earlier. Consequently, the Andaman and Nicobar Islands Forest Plantation and Development Corporation Ltd. (ANIFPDC) should be wound up as it was primarily set up to promote commercial forestry and plantations, especially in Little Andaman.***
9) ***At the same time, efforts should be made to reduce the level of demand for timber and for firewood. For the purpose, the A&N Administration should investigate and implement methods of achieving***

this, including the conversion to the wood and bamboo based "Assam type" construction, which is both less timber intensive, and safer in earthquakes, than the present all-timber or RCC buildings.

Wood Based Industry

10) ***There should be a complete ban on the establishment of any new wood based unit for the next 10 years.***
11) ***All existing small-scale wood based units (saw mills) should be relocated within industrial estates or, where industrial estates are not feasible, in locations contiguous to forest offices or otherwise convenient for the forest department to monitor. This relocation should be completed within one year, after which the non-complying saw mills should be closed down. These saw mills should also be required to obtain a licence from the ANI Forest Department within three months and to maintain such records as may be prescribed by the forest department. Their licence may be renewed every year at the discretion of the ANI Forest Department, after the department has satisfied itself that a) the unit was not involved in the use of any illegal timber; b) the prescribed records were properly maintained; c) all provision of the act, rules and the terms and conditions stipulated by the forest department from time to time have been complied with. Necessary rules, guidelines etc., for the purpose, should be prescribed by the forest department within three months.***
12) ***No subsidy of any type, including transport subsidy, should be given to any wood based unit.***
13) ***Existing medium and large scale wood based industries (including plywood, veneer, and match industries) can be allowed to function provided they import their entire requirement of wood and other forest based raw materials from the mainland or from abroad. No subsidies should be allowed to them.***
14) ***No timber, either as logs or as sawn timber or plywood/veneer, or in any other form, should be transported out of the Islands through any means whatsoever. This should not, however, inhibit the transportation, as personal baggage, of a reasonable quantity of wooden handicrafts by tourists or of personal articles by those permanently leaving the islands. Also, where a wood based industry, as specified in 13 above, imports its entire wood and forest based raw material requirement, then it should be permitted to export its finished product.***

B. USING UNTREATED TIMBER FOR CONSTRUCTION

Another factor contributing to an increasing demand of timber is the fact that most of the timber used in the Islands is not treated prior to being used for construction purposes. This results in its having a very short life, requiring replacement every three or four years. Despite the fact that the then Inspector General of Forests, Government of India, had recommended way back in 1989 that: "No timber should be used without proper preservative and seasoning treatment to prolong the life of timber" (Oka 1989), the current installed capacity for treating timber is only 1,900 cum per annum. (Annex 11), which is far below the local requirement of treated timber, estimated to be around 5 to 10 thousand cum per annum. Treated timber has a life that is reportedly ten times greater than that of untreated timber. Therefore, by treating all timber, the demand should come down ten fold.

Recommendation

15) ***All timber, bamboo and cane used for construction and requiring treatment in order to extend its durability and life, should be so treated and the administration should ensure that requisite capacity to treat all such timber is in position within a period of six months. After the expiry of this period, no timber, bamboo or cane of the type requiring treatment should be sold for use in building and construction activities, or used for such purpose, unless it has been appropriately treated.***

C. ENCROACHMENTS

Another major threat to the forests of the Islands is because of encroachment of forest areas. The A&N Administration had already identified and regularised the forest encroachments of 1367 families who had encroached up to 1978, on over 2500 ha. of forestland. They were to be regularised/resettled in one hectare land each and 1367 hectares of forestland had, with the approval of the MoEF, been denotified in 1988 for the purpose. However, a large proportion of the families that had to be shifted have not been shifted to their designated sites. Therefore, they continue to occupy forestland and to further expand and degrade their holdings (Source: ANI administration, Volume II, pages171- 173, 71-76). There is no obvious reason why these families have not yet been shifted, despite decisions in the IDA and other bodies to this effect.

Meanwhile, many of the families who continue in, or have been shifted to, their designated sites of 1 ha each have, reportedly, encroached additional land and are now sitting on areas far in excess of those allotted to

them. Concurrently, those families who have not yet been shifted continue to reside in forest areas on sites that are mostly much larger than 1 ha and often progressively increasing.

Besides, reportedly some of the families originally identified as pre 1978 have now moved away and in their place new families have settled on their encroached land. These families are reportedly now claiming pre-1978 status.

In addition, an estimated 2325 families have encroached subsequent to 1978 on 2633.654 ha of forestland (details at annex 12). These have now been identified though little action seems to have been taken to remove them from the forest areas.

Unfortunately, many of these encroachments are in some of the last remaining natural lowland forests in North Andaman. Also, they appear to each be growing in size and collectively growing in numbers (Aerial pictures of encroachments in the forests of Diglipur, North Andaman, enclosed from page 47 onwards. Maps of encroachments at annex 13-18).

Recommendations

16) ***Any further regularisation of encroachments on forestland in any from, including allotment/use of forestland for agricultural or horticultural purposes, should be strictly prohibited.***
17) ***All those families who have been identified as having encroached on forest land prior to 1978 and have not yet shifted to their allotted rehabilitation sites, should be given three months notice to vacate their encroachments and shift to the allotted land. Failing this, their allotment should be cancelled and they should be forcibly evicted within three months of the deadline being over, without any further claim to land or any other form of rehabilitation.***
18) ***Similarly, those among the pre-1978 families that have shifted to their allotted sites but have occupied more land than they were entitled to, should also be given three months notice to vacate the extra land occupied by them. On the expiry of this notice period, the allotments of those who have not complied with this notice should be cancelled and they should be forcibly evicted within three months, without any further claim to compensation or land.***
19) ***All post 1978 forest encroachments should be completely removed forthwith and, in any case, within six months. Post 1978 encroachers (except for foreign nationals) should be allotted homesteads in revenue land and training and opportunity for self-employment or for other types of livelihood activities provided.***
20) ***The forest officials in the ANI should be given requisite powers to do this, including:***
    - ***Power of summary eviction of encroachments: As in the case of Madhya Pradesh, vide Section 80A, IFA, 1927.***
    - ***Magisterial powers to assistant conservators of forests: The Assistant Conservators of Forests should be appointed as executive magistrates/special executive magistrates in order to oversee the evictions carried out by the Range Officers on receipt of orders of eviction from the estate officers.***
21) ***For the purpose, an effective action plan should be prepared and implemented under direct supervision, monitoring and control of a committee comprising of the Lt. Governor, Chief Secretary, Principal Chief Conservator of Forests of ANI, and reputed local NGO representatives. The Chief Secretary, ANI, may be asked to file a monthly progress report in the Supreme Court.***
22) ***In order to prevent any further encroachments and rampant immigration, the Administration should, within three months, regulate the entry of people to the islands by having the Islands declared as an inner line area and by imposing relevant restrictions under section 3 and other provisions of the Environment (Protection) Act of 1986. In accordance with this, non-residents entering the islands should have to invariably register themselves so that those who do not return to the mainland within a reasonable time can be traced and, where they have illegally encroached on land, can be evicted from these encroachments at the earliest. In addition, entry to the more vulnerable and forested areas of the Islands should be restricted.***
23) ***Once this regulation is in position, the administration should in a time bound manner issue identity cards to all the residents so that there is no gap in the period of identification and issuance of ID cards. This would ensure that fresh illegal encroachers are easily identified. Subsidised travel to the Islands should, once identity cards have been issued, be available only to bonafide residents of the Islands.***

24) ***Divisional Forest Officers and, where relevant, village protection committees, as described later, should be made responsible for prevention, early detection and quick eviction of new forest encroachers.***

25) ***The forest department should be strengthened and appropriate village institutions set up for the purpose, as detailed later.***

D. ROAD THROUGH THE JARAWA TRIBAL RESERVE

Perhaps the best remaining natural forests in the Andaman Islands are in the tribal reserves. The most significant of these are the Jarawa Reserve in South and Middle Andaman and the Onge Reserve in Little Andaman. Due to the earlier hostility of the Jarawas, these areas were left alone. However, in recent years the Andaman Trunk Road has opened up and passes contiguous to and in some cases through the tribal reserve (map at **annex 21**). This road, and the increased access to the Jarawas, poses a major threat not only to the Jarawa tribals but also to the forests that they have protected for so many years. The road has also made it easier for encroachments to take place in the forests by allowing easy access to many forest areas that were earlier not easily approachable.

Interestingly, a high level committee constituted at the behest of the then Prime Minister, Mrs. Indira Gandhi, had suggested in the early 1980s that, as regards the Andaman Trunk Road:

"i) though the absence of any road would be the ideal condition for the Jarawa, the next alternative would be

ii) to realign the road so as to orient it as far away from the boundary for the Jarawa Reserve as possible."

Recommendation

26) ***The Andaman Trunk Road should be closed to all vehicular traffic from Miletilak in South Andaman to the northern boundary of the S. Andaman Island. Similarly, it should be closed to all traffic from Kadamtala (corresponding to Prolobjig camp No.3) in Middle Andaman up to Kaushalya Nagar (corresponding to Porlobjig camp No. 15). This should be done within three months. Further, no person except for the Jarawas living in the Reserve should be allowed to enter the Reserve by any means unless he/she is permitted by the Principal Chief Conservator of Forests, and the Secretary, Tribal Welfare, ANI Administration, and no such permission should be granted unless the person is proceeding on bonafide work related to the welfare of the tribals or the protection of the area.***

E. DIVERSION OF LAND AND FELLING OF TREES FOR DEVELOPMENT PROJECTS AND ACTIVITIES

From time to time the Ministry of Environment and Forests (MoEF) has been granting permission under the Forest Conservation Act for the diversion of forestland for non-forest uses. Naturally grown trees are also being cut for various purposes including for the development of tourist and defence infrastructure. However, there appears to be no land use plan for the Islands and clearances seem to be given on a case by case basis without determining the optimality of the land use and the future options that such a clearance could compromise.

The defence forces have recently constituted a combined command of the Navy, Air force and Army, in the Islands. However, there appears to be no clear understanding of how much land they would require and how many trees need to be cut in the process. There have been requests from them for allowing the felling of over a thousand trees for clearing approaches to runways and for other such requirements. However, no one was able give a consolidated picture of the requirements. Though efforts were made on both the visits to talk to the armed forces representatives on this matter, they were not available.

Recommendations

27) ***The felling of 27 trees for the 33 KV transmission line from Bamboo Flat to Minnie Bay, and 17 trees for construction of rural road from Adajig to Flat Bay Village should be permitted as a one-time relaxation, as these projects are already in their final stages, a small number of trees are involved and, reportedly, necessary clearances had been obtained from the MoEF prior to the Supreme Court's order of 10.01.01. However, all other proposals or clearances under the Forest (Conservation) Act of 1980 or the Environment (Protection) Act of 1986, where diversion of land or felling of trees or other activities that would have an impact on the environment, are still to be undertaken, should be put up for review by the Supreme Court.***

28) ***For the conservation and protection of the forests and other ecosystems, an effective action plan should be prepared by the ANI Forest Department, in consultation with local NGOs and experts. This plan should also envisage a suitable enhancement of the protected area network, especially in the main islands of the Andaman and in the Nicobar Group. All unworked forest areas in Diglipur,***

Mayabunder, Middle Andamans and Baratang should be made into national parks, leaving a buffer belt between the national park boundary and the edge of revenue settlements, for protection by village protection committees. In addition, there should be a consolidation of the nearly hundred small island parks and sanctuaries and they should be constituted into viable units encompassing the marine areas surrounding them. This plan, after being approved by the MoEF, should be strictly implemented. The necessary funds, vehicles, equipment, human power, police help and legal power required for the effective implementation of this action plan should be made available by the ANI administration.

29) ***Appropriate regulations under existing Acts like the Environment (Protection) Act of 1986, with similar objectives as The Delhi Preservation of Trees Act, 1994, currently in force in the Union Territory of Delhi, should be set in place in ANI, within six months, to regulate the felling of trees on non-forest land.***

F. POACHING

Both the government and the local people reported the incidence of poaching of trees, other forest produce, wild animals and marine life. It was stated by many of the citizen groups that poachers from Myanmar and other neighbouring countries also come to poach timber, sea cucumbers and other species, especially in North Andaman. There are also local poachers operating in the Islands. The forest department does not appear to have the infrastructure, especially in terms of manpower, arms and fast boats, to prevent poaching. Also, they appear not to have requisite powers to deter poaching and effectively apprehend poachers.

Recommendations

30) ***The Forest Department should be immediately strengthened in order to be able to effectively prevent poaching.***

31) ***Forest officers should be given adequate powers, under the Indian Forest Act of 1927 (IFA,) as has been done in other states, to meet the threat of poaching. These could include:***

- ***Power of confiscation: as provided for vide Section 52, 52A, 52B and 52C IFA, 1927 in Bihar, Section 52A and 52B in Himachal Pradesh, Section 52, 52A, 52B, and 52C in Madhya Pradesh, Section 62A to 61G of Goa, Section 61a to Section 62G of Gujarat, and Section 61A to 61G of Maharashtra.***
- ***Increase in the limit fixed for amount of compensation for trees under section 68(3) IFA, 1927: The present limit of Rs. 50 is required to be increased to Rs. 10000/- as in Goa.***

32) ***A co-ordination mechanism should be set up where the forest department, the civil administration, the Coast Guard and the Combined Defence Command in ANI can take co-ordinated action against poachers, especially against foreign poachers.***

G. INTRODUCTION OF EXOTICS

The introduction of exotics is always a threat to ecosystems, but it is a special threat to Island ecosystems, as is obvious in the ANI.

Over the years, many exotic species of animals and plants have been introduced in the Islands, some deliberately and many accidentally. Some of those that have had a very destructive impact on forest regeneration include the spotted deer (cheetal) and the elephant. The deer, reportedly brought for aesthetic purposes, have proliferated widely due to the absence of any natural predator in the Islands and have significantly retarded forest regeneration. The elephants were brought to the Islands by a timber logging company, which subsequently abandoned them. Reportedly about sixty of them have become feral and are seriously impacting on the forests in the regions that they are found. The introduction of dogs and cats, many of which have turned feral, also pose a great threat to turtle breeding and other indigenous species

There has also been infestation by various exotic species of weeds, which could prove to be a major deterrent to the regeneration of degraded forest areas, especially areas freed from encroachment.

The introduction of oil palms in Little Andaman and of teak in various parts of the islands has also had a significant negative impact. In fact, the areas in Little Andaman where oil palms were introduced show up clearly as degraded forests in the remote sensing map prepared by the Forest Survey of India (FSI) (maps at annex 19).

Recommendations

33) ***No exotic species of fauna or flora should be introduced into the islands. Accordingly, a suitable set of guidelines and procedures should be developed for the purpose.***

34) A time bound action plan should be drawn up to deal with the exotics already on the island, including weeds, and their removal/eradication should be taken up on a war footing, including the translocation of elephants back to the mainland and the inhibition of breeding, by deer, by darting the alpha males with anti-fertility drugs, as has been successfully tried in other countries.

H. COLLECTION AND DISTRIBUTION OF ROYALTY FREE TIMBER AND NON-TIMBER FOREST PRODUCE

Apart from commercial timber, the forests of these Islands are also providing timber and NTFP for use by the local people (annex 20). There is also "royalty free" distribution of timber.

In addition, government departments like PWD (for construction and repairs of roads) and the defence forces also directly access fuel wood. This not only leads to unregulated extraction but, in some cases, as along the Andaman Trunk Road, is leading to perceptible forest destruction.

Recommendations

35) The practice of distributing timber and NTFP free to settlers should be discontinued. Instead, rural populations should be formed into village forest protection committees and, as per the joint forest protection norms prevalent in other parts of the country, the amount of timber and NTFP required by village communities should be given to them on the basis of a memorandum of understanding, in return for their role in protecting the forests adjacent to their settlements and in detecting and preventing encroachments.

36) Government departments, including defence and PWD, should be supplied fuel wood and other required forest produce by the forest department and should not be permitted to directly collect these from the forests.

37) ***Concurrent efforts should be made to minimise demand for forest-based resources. The Administration should encourage the use of sawdust as fuel, as is the practice in many other parts of the country. They should also investigate the possibility of replacing firewood as a domestic fuel by gas and consider giving a one-time subsidy for the purchase of gas stoves and cylinders to the poor rural population. Adequate supply of LPG to the Islands should be ensured on a priority basis.***

I. MINING OF SAND

The erosion of the beaches and the depletion of coastal and marine species all have an impact on the forests and on the overall ecological status of the Islands. Coastal erosion affects the forests and degrades them directly. Besides, the complex interaction between insects, birds and forest plants gets disrupted as soon as there is degradation of coasts and coastal and marine species. Forest working also affects the coastal ecosystem, especially the coral reefs, by accentuating the flow of silt into the water.

Under the Coastal Regulation Zone (CRZ) notification under section 3(1) and section 3(2)(v) of the Environment (Protection) Act, 1986 and rule 5(3)(d) of the Environment (Protection) Rules, 1986 declaring coastal stretches as coastal regulation zone (CRZ) and regulating activities in the CRZ, "Mining of sands, rocks and other substrata materials, except those rare minerals not available outside the CRZ areas;" were banned. However, a special exception was made for the ANI, as under.

> "Provided that in the Union Territory of the Andaman and Nicobar islands, mining of sands may be permitted by the Committee which shall be constituted by the Lieutenant Governor of the Andaman and Nicobar Islands consisting of Chief Secretary; Secretary, Department of Environment; Secretary, Department of Water Resources; and Secretary, Public Works Department. Committee may permit mining of sand from non-degraded areas for construction purposes from selected sites, in a regulated manner on a case-to-case basis, for a period up to the 30th September, 2000. The quantity of sand mined shall not exceed the essential requirements for completion of construction works including dwelling units, shops in respect of current year and 2000-2001 annual plans. The permission for mining of sand may be given on the basis of a mining plan from such sites and in such quantity which shall not have adverse impacts on the environment."

The MoEF has further extended the period up to 30 September, 2002. However, there is no assessment of the either the general environmental impact on the ecosystem of the Islands because of the extraction of sand, nor a location-specific assessment of the impact of extraction on each specific beach/coastal stretch from where

such extraction takes place. Therefore, it is not clear on what basis the MoEF has allowed and continues to allow the extraction of sand. .

According to the figures supplied by the ANI administration, approximately 2,23,937 cubic metres of sand was officially extracted from the beaches of the Islands in the three years 1998-2001. 72 beaches around the islands were used for extraction (annex 22). In addition, it is alleged by local people that there is also illegal extraction of sand, which is considerable.

Sand is primarily extracted for construction purposes. It is undeniable that the extraction of sand is causing a lot of environmental damage and that this is not a sustainable method of resource use. However, there appears to be no effort to phase out the extraction and to move towards other, more sustainable, methods of construction. Also, as the Islands are located in a high earthquake-risk zone, it is undesirable to construct concrete buildings there. Alternative construction material is available in the Islands and the small amount of concrete that still might be needed can easily be made using rock dust.

Recommendations

38) ***The extraction of sand should be phased out and no further extension should be granted after the current extension is over on 30 September, 2002.***

39) ***As already mentioned earlier, alternate material for construction, including treated bamboo and soft woods, should be encouraged as this is less damaging to the environment and safer in case of an earth quake. Stone dust should be utilised where use of concrete is essential.***

J. INAPPROPRIATE TOURISM

The ability of the fragile ecosystem of these islands to withstand the impact of tourism is limited. Apart from disturbance to the forests, there is also disturbance to the marine and coastal ecosystem, especially to the coral reefs. This can be seen in the Wandoor National Park where the coral reefs, in the two islands open to tourists (Jolly Buoy and Redskin), have almost totally been destroyed. There is also the problem of water availability, disposal of garbage, generation of electricity and the construction of other infrastructure. Also, as most of the food and other goods sold in the Islands are imported form the mainland and the government pays a hefty subsidy for their transportation to the Islands, it is unlikely that the expenditure by the tourists for goods and services in the islands, would result in any net benefit to the economy. In fact, tourists coming by ship are often a net drain on the economy, as the government subsidy on each passenger ticket is also very high.

The Islands offer a great potential for high value, low volume, specialised eco-tourism that can be done with minimal infrastructure and follows the principles of dispersion and flexibility. Special-interest tourists, wanting to view the unique and rich biodiversity of the Islands, can be accommodated in wilderness areas in small clusters of tents with low concentrations in any one place. The location of these tents can be shifted every two or three years to ensure that no one site is inordinately impacted. Besides, there can be some ship-based tourism where specialised tourists are taken around in a ship that anchors at spots of tourist interest and allows day trips in small numbers. In fact, there are already foreign yachts coming and anchoring in the islands, but very little benefit flows from them to the local economy (annex 23).

Recommendations

40) ***No concrete or permanent infrastructure for tourism should be built on any forest area in the Islands. Tourist activities in forest areas should be restricted to tented accommodation or temporary wooden/prefabricated structures that can be dismantled easily and moved to another site. These areas should remain under the control of the forest department who should be responsible for ensuring that the quantum and type of tourism is such that it does not in any way degrade the forests or other ecosystems.***

41) ***A proper eco-friendly tourism plan should be developed for the Islands within one year. This plan should also do an economic and a distributional analysis to highlight how tourism can make a net contribution to the economy of the Islands and how the economic benefits can be equitably distributed among the various segments of the local society and generate local employment.***

42) ***Such a plan must be in conformity with the requirement for conserving the ecological and cultural integrity of the Islands and not pose a security threat to this strategically important area.***

Miscellaneous Recommendations

43) ***The forest department and the administration of ANI should make public at the beginning of each year the proposed uses of natural resources, including forests. This detailed information specifying, among other things, uses, locations, quantum, purpose and users, and giving details of the basis on which these decisions have been made, should be published in the local news papers and also made***

available on a web site to be maintained for the purpose by the administration. At the end of each year, actual use, deviations from the proposals and the reasons thereof, must also be similarly made public.

44) The various forest working plans/protected area management plans should also be made accessible to the public, as soon as they are approved. Copies should be kept at all public libraries and other accessible places in the Islands. In addition, copies should be freely made available to the general public, on demand, after charging actual costs of photocopying.

45) All officers of the administration, including forest officers, should undergo an orientation training of at least five days, every three years, to acquaint themselves with the ecological characteristics of the Islands and the options available for their economic development in an environmentally and socially sustainable manner. Officers being posted from the mainland to these islands should be so oriented within three months of their posting.

46) The Government of India and the ANI Administration should consider setting up an Island Development Institute in ANI, that can become a centre of research, training and education for managing island and coastal ecosystems in a sustainable manner. This institute could not only cater to national needs but, over time, also become a regional institution. A proposal to the effect already exists and was submitted to the IDA many years back. It can be suitably modified and considered.

47) There are many areas that need to be properly researched and many problems that need innovative solutions. These include:

- ***A assessment of the ecological differences between worked and un-worked forests.***
- ***Methods of returning the worked and encroached forests to a their natural state.***
- ***Methods of further working forests in a manner that minimises impact on biodiversity and the environment.***
- ***Methods to conserve soil and water.***
- ***Feasibility of generating energy through non-conventional methods, including wind and tidal energy.***
- ***Methods of treating garbage and other pollutants, thereby protecting the coastal and marine environment from degradation.***
- ***Methods of using alternate building materials that are environmentally friendly and sustainable.***

These and other required studies should be commissioned on a priority basis so that their findings can be urgently applied for the betterment of the islands.

VI. SOME POSSIBLE IMPLICATIONS OF THE RECOMMENDATIONS

1. There is likely to be some loss of employment, as detailed below, if these recommendations were followed.
   a. Loss of about 300 jobs if Kitlpy Industries close down as a result of these recommendations.
   b. Loss of about 2000 jobs if the Andaman & Nicobar Islands Forest and Plantation Development Corporation closes down.
   c. Loss of some employment (exact quantum not known) due to the ban on export of timber. However, this is likely to be very small, as very little timber was being sent to the mainland by private sawmills. In 1998-99 it was 923 cum, in 99-2000 it was 570 cum and in 2000-01 it was 614 cum.
   d. Surplus staff in the forest department due to curtailing of forest working and extraction.
   e. Some loss of livelihood due to the banning of extraction of sand.
   f. Some loss of road transport related employment due to the banning of traffic on the Andaman Trunk Road.
   g. Need for additional sources of livelihood for about 2300 post 1978 forest encroachers, once they are removed from the forests.
2. However, following from these recommendations, there will also be significant cost saving and additional employment opportunities, as detailed below.
   a. Savings on transport subsidies to the forest based industry to the tune of rupees five to six crores per year.

b. Savings from the closing down of two forest depots, one in Chennai and one in Kolkata, reportedly around rupees one crore a year.
c. Additional employment for setting up forest protection forces.
d. Additional employment in regenerating encroached areas and earlier worked forests.
e. Additional employment in the shipping sector due to increased ferry traffic after closing down the Andaman Trunk Road.

3. There are other relatively untapped or under-utilised areas of employment that can be developed. Including:
   a. Fisheries – especially coastal – with local involvement. Current estimates suggest that only a small proportion of the fishery potential is being tapped. The islands have a continental shelf of 16 to 35 thousand sq km (according to different sources) and an exclusive economic zone (EEZ) of 600,000 sq km., which is 28% of the total Indian EEZ. The total potential has been variously calculated to be between 12,000 and 1,60,000 tonnes of fish (M*aster Plan for Andaman and Nicobar islands for the Development of Fisheries*, Government of India, Ministry of Agriculture, 1989*)*, just from the shelf area. However, more recent estimates are between 45,000 and 1,60,000 tonnes pa. According to the ANI administration, the current levels of harvest are just a fraction of the harvestable potential (Volume II, page 136).
   b. Production of goods/food for local use – and the consequent removal of subsidies for transportation of these goods from the mainland. At present, almost all the goods for local consumption come from the mainland. Their transportation, by ship, also costs the government dearly in subsidies. However, many of these goods can be produced locally. This would not only promote local employment and save on subsidies, but also cut down on the requirement for cargo space.
   c. Handicrafts. There is great potential for developing artisanal handicrafts industry and this could provide significant additional employment.
   d. Swiftlet nest cultivation. This is potentially a very lucrative activity. There is great demand for swiftlet nests in the nearby Southeast Asian countries, and 1 kg fetched between Rupees one and two lakhs. A note describing the potential has been enclosed in Volume II, page 300.
   e. Orchids cultivation. This, again, has tremendous potential, as these islands have a large number of very beautiful and rare orchids.
   f. Spices/ Medicinal plants – without expanding agricultural land. All official settlers in the islands were given two hectares of flat (valley) land and two hectares of hill land. Much of this hill land is still forested and its conversion to agricultural land, apart from not being economically viable, would also cause significant soil erosion and disrupt the water cycles. Therefore, this land can be used for activities conducive to soil and water conservation, like high value spices/medicinal plants. There are many valuable spices and medicinal plants that are found in the Islands.
   g. Eco tourism. This, again, has tremendous potential. High value specialised ecological tourism can generate a fair amount of local employment at all levels.
   h. Water and soil conservation works. These are desperately needed in the ANI, which has acute water shortage and is also losing a lot of its topsoil, thereby disrupting the terrestrial, coastal and marine ecosystem. Existing schemes of the government of India, like the watershed programme, can be extended and strengthened in these islands to both conserve the environment and generate employment.

4. Consequently, the potential for additional employment, if properly developed, is enough to offset any adverse impacts of the recommendations. Besides, if the Island is developed as a centre of education, research and training in island and coastal management, as recommended earlier, many additional jobs can be created. In fact, over time, caution will have to be exercised to ensure that the requirement for human power in the Islands does not exceed the local supply, necessitating further migration from the mainland.

5. There is also some concern expressed by the ANI forest department that if felling in unworked forests was banned then the worked forests and plantations would not be able to support even the local demands for timber. However, detailed discussions with the department and a scrutiny of documents and data brings out the following facts:

a. The total area of worked forests in the Andamans, excluding Little Andaman, is approximately 1,00,000 ha.
b. Most of these forests were worked in a manner such that only a proportion of the mature trees of commercial species were extracted and the immature ones left.
c. Therefore, in each hectare of the worked forests there should now be a large number of mature trees that were either left behind as mother trees or that were immature when the logging was done fifty to sixty years ago, but are now mature and ready for harvesting.
d. As the surplus number of commercial trees, in excess of what would have been their numbers in a natural forest, have to be removed in order to allow the forests to return to as close a natural form as possible, the extraction of these mature trees would serve the dual purpose of providing timber for local consumption and returning the forests to a near-natural profile.
e. It has been estimated that at least 10 cum per hectare can be safely and sustainably extracted from these worked forests, though once working plans are made the figure might go up. Therefore, given that the total available worked forest is 1,00,000 ha, the total availability of commercial timber would work out to 10,00,000 cum. This would be enough to meet the local timber demands (calculated at 30,000 cum per year currently, but likely to go down once timber conservation efforts are put in place) for at least 30 years, by which time additional timber would have become mature and harvestable.
f. In addition. There are over 12,500 ha of plantations of hardwoods done in the islands (annex 4). It is estimated that these plantations, that in any case need to be cleared so that the land can be regenerated, will provide 300 to 500 cum per hectare, depending on the species. This would work out to between 37,50,000 cum to 62,50,000 cum of timber, which would by itself be enough to meet the local hardwood requirements (calculated to be about 25,000 cum per annum - for details see Volume II –page 154-55, 161) for between 150 and 250 years. Needless to say, both in the plantations and in the worked forest areas, extraction should start first in the earliest plots and proceed to newer ones so that adequate time is given for regeneration.

6. The forest department has also expressed a concern that if no export of timber is allowed to the mainland then this might lead to the artificial manipulation of timber prices locally and prices would be artificially forced down, as the forest department would have no option but to sell their timber locally or have it perish. However, considering that the forest department saw mills have a combined capacity of 29,000 cum pa they could, if required, process all the timber that is harvested in a year, thereby preventing it from deteriorating. Besides, once the capacity to treat timber has been enhanced, as recommended, there should be no danger of any timber being wasted if the local sawmills do not pick it up. In case timber in any month is not picked up, felling for subsequent months or seasons could be trimmed to take this into consideration.

7. A concern has also been expressed that forests need to be worked in case they are to remain healthy and "over mature" and dead trees need to be removed. There is also the view that once a tree reaches a certain age, it has a "negative increment" and, therefore, must be cut. However, these arguments do not stand up to scientific scrutiny. Forests have existed and continue to exist in areas where they have never been "managed" by human beings. There are many examples of this in the Andaman and Nicobar Islands itself. The concern for negative increment and for "healthy" forests is a concern that might be relevant to commercial plantations but is certainly not tenable where natural forests are concerned. In fact dead trees are as important a part of natural ecosystems, both as habitat to specialised species of fauna and flora and an input into the soil, as are live trees.