

# Proceedings

## **Workshop on the Management of Protected Areas In the Andaman and Nicobar Islands**

Organised by  
Department of Environment and Forests, Andaman and  
Nicobar Islands,  
Andaman and Nicobar Environment Team  
&  
Indian Institute of Public Administration, New Delhi

Supported by



The UK Governments Darwin Initiative for the Survival of  
Species  
And



**Fauna & Flora International**

**Port Blair  
Andaman and Nicobar islands  
India**

**9 - 11 July 2001**

## Organising Institutions

**Department of Environment and Forest, Andaman and Nicobar Islands** is the department of the Andaman and Nicobar Administration in charge of forests, wildlife and environment. The Secretary, Environment and Forests, Andaman and Nicobar Administration, who is also the Principal Chief Conservator of Forests, heads it. The Chief Wildlife Warden, who works under the overall supervision of the Principal Chief Conservator of Forests, heads the Wildlife Wing.

**Andaman and Nicobar Environment Team (ANET)** The organisation was formed in 1989. The primary objective of ANET is “to help ensure the long-term survival of as much of the ANI natural biodiversity as feasible, whilst recognising the needs of the human inhabitants, especially the threatened aborigines”. ANET’s work covers the fields of research, applied conservation and environmental education. Since 1997, a project entitled “Biodiversity Conservation and Protected Areas Management Planning in the Andaman Islands” was initiated by ANET in partnership with Fauna & Flora International, United Kingdom, supported by the Darwin Initiative for Survival of Species. The objectives of the project include research and field survey within and around three existing protected areas, training of ANET researchers and Forest Department staff in species surveys and monitoring techniques, data collection, and evaluation and formulation of management plans.

**Indian Institute of Public Administration (IIPA)** was set up in 1954 to enhance the leadership and managerial capabilities of executives in government, public sector enterprises and other public organisations. It is an autonomous body registered as a society. The institute has faculty in the fields of economic analysis and financial management; human resource development and behavioural studies; management studies, public enterprises and computer applications; public policy, planning and environmental studies; social welfare administration and administration of justice; rural studies; and urban studies.

## Supporting Institutions

**Fauna & Flora International (FFI)** was founded in 1903, and is the world's longest established international conservation body. It is one of the few organizations whose remit is to protect the entire spectrum of endangered plant and animal species on the planet. As per its mission statement "*Fauna & Flora International acts to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, are based on sound science and take account of human needs.*"

FFI provides support to conservation initiatives throughout the world, in the form of partnerships, technical assistance, direct funding and consultancy. A firm belief in the importance of conserving nature, in accordance with the Convention on Biological Diversity, underpins all activities. The ethos underlying all work is that conservation should be achieved through the application of scientific understanding, a genuinely participatory approach, local

capacity building and long-term commitment. FFI aims to arrive at solutions that are simple, sustainable and applicable at local level.

***The Darwin Initiative for the Survival of Species*** was announced by the British Government at the Earth Summit held in Rio de Janeiro in June 1992, and is run through the UK's Department of the Environment, Transport and the Regions. The Darwin Initiative seeks to help safeguard the world's biodiversity, by drawing on British strengths and expertise in this area to assist those countries that are rich in biodiversity but poor in financial resources to fulfil their obligations under the Convention on Biodiversity. Projects funded under the Darwin Initiative are collaborative, involving either local institutions or communities in the host country, are of high quality and scientific excellence, and demonstrate good value for money. Whenever possible, Darwin funding will be used as a catalyst to lever additional funding for project work, which would not otherwise be forthcoming. Activities in the following project areas are supported: institutional capacity building; training; research; work to implement the Convention on Biodiversity; environmental education or awareness.

## Introduction

Fauna & Flora International, with the support of the Darwin Initiative, had commissioned a project on protected area management in the Andaman Islands. The overall goal of this project was to support the establishment of effective protected areas management in the Andaman Islands. Its specific objectives were:

- To enable the collation and publication of available knowledge and information on the biodiversity of the Andamans from diverse sources
- To support field studies to fill gaps in knowledge
- To hold a workshop to review and set priorities for the management of terrestrial protected areas in the Andamans
- To produce a set of recommendations based on the findings of the workshop

The Andaman and Nicobar Environment Team (ANET), Port Blair, and the Indian Institute of Public Administration (IIPA), New Delhi jointly implemented the project.

In fulfilment of specific objective 3 above, a workshop was organised in Port Blair, Andaman and Nicobar Island, from 9 to 11 July, 2001, by the Department of Environment and Forests, Andaman and Nicobar Islands, in collaboration with ANET and IIPA, and with the support of Fauna & Flora International and the Darwin Initiative. Prior to the workshop, there was a field visit to Mount Harriet National Park on 7 July and to Wandoor national park on 8 July 2001. 95 participants attended the workshop, both from the Islands and from elsewhere. The participants included forest department officials, other government officials, members of the armed forces, NGO representatives, scientists, journalists and other interested individuals (see annex 1 for list of participants).

The detailed proceedings of the workshop are given below (see annex 2 for the schedule).

## Workshop Proceedings

**Inaugural Session: 9th July 2001**

**1000-1045**

*Mr. Balbir Singh, Chief Secretary, Andaman and Nicobar Islands (ANI), inaugurated the workshop in the presence of the Member of Parliament from the Andaman and Nicobar Islands, Mr Vishnu Pada Ray. Mr P.V. Savant, Chief Conservator of Forests (CCF), welcomed the chief guest, the Member of Parliament, and other participants, and introduced the workshop objectives to the participants. Mr D. P. Yadav, Assistant Conservator of Forests (ACF), announced the programme and introduced the speakers.*

**Mr P.V. Savant**, the CCF, in his introductory remarks, gave a brief introduction to the unique tropical ecosystem of the ANI. He drew attention to the rich biodiversity, as evident from the large number of flowering plants (2500), of which 14% were endemic to the ANI. Faunal diversity was equally rich with 60% endemism. It was reported that one hundred and ninety seven species of corals had, to date, been identified around these islands. Mangroves in many areas were, according to him, in a pristine state. Forest types ranged

from the giant evergreen to the tropical evergreen, moist deciduous and littoral forests. The Forest Survey of India reported, in 1999, that dense forests covered 76% of the Islands, 1.5% were open forests and 12% of the geographical area were under mangroves. He added that some virgin areas with good biodiversity values, which are not currently under protection, should be considered for inclusion into the protected area network.

The CCF's plea was that "these islands should not be considered as a source of revenue, but acknowledged as the last refuge of an ecological, genetic and ethnic store house. The future of indigenous communities needs to be deliberated upon and a rational strategy evolved, so that the aboriginal population is not wiped out, in the process of transformation". He concluded, saying that these islands were an ecological paradise and a living laboratory, yet to be explored fully.

**Mr Shekhar Singh**, from IIPA, spoke next and stressed that the challenge before conservationists, planners and administrators was to economically develop these islands while conserving their biodiversity. He appealed to the foresters and other civil servants to work with scientists, conservationists and NGOs and evolve a sustainable-development plan for the Islands. He recalled that ten to fifteen years back, the debate was about development versus the environment. However, today it is widely recognized that you cannot have social and economic development without safeguarding the environment. Andaman Islands are especially important, he stressed, because in his opinion one of the major technologies of the future was biotechnology and since much of the biodiversity resources of the world are concentrated in the developing world, these will soon become the most important economic resource for such countries. From an economic point of view ANI, being a storehouse of biodiversity, would hold out tremendous economic opportunities for the country.

As a sequel to the workshop, he felt that a network of people interested in helping ANI to develop in a sustainable manner should be established.

**Mr Balbir Singh**, the chief guest, in his inaugural address, touched upon the rich biodiversity of ANI and the economic importance of a well protected and sustainably used forest ecosystem. However, he felt that much more had to be done, particularly on the protection front. One of the major threats to the biodiversity of these islands was from poachers of neighbouring countries. ANI comprised a large number of islands, with a very long coastline of about 2000 km and as such, it was difficult to patrol the entire coastline. The Administration was now coordinating the efforts of the Indian Navy, Coast Guard, Police Department and Forest Department to deal with the situation. Another important issue, which he requested the participants of this workshop to address, was that of conserving biodiversity, while carrying on development. He was happy to see that in the programme of the workshop, presentations were included on issues like tourism, industries, human habitation, tribals, etc., which were important from the point of view of development. Deliberations on these issues would definitely lead to useful and practical recommendations. He welcomed the participants and thanked them for taking the trouble to come to these islands for participating in this workshop. He concluded by expressing his best wishes for the success of this workshop.

**Mr Alok Saxena**, the Chief Wildlife Warden (CWLW), proposed a vote of thanks at the end of the session.

## Technical Session I: 1100-1300

Chair: **Mr P.V. Savant**, CCF, ANI

The first speaker at the session was **Mr I.H. Khan**, past CWLW of ANI. He spoke on the conservation and management of tropical rain-forest protected areas in the A&N Islands. Mr I.H. Khan said that “ Both compositionally and taxonomically, the forests present a variety, hardly matched anywhere else. The vegetation and its dependent fauna have Polynesian, Indo-Malayan and Burmese affinities, besides characteristics of Oceanic Islands”.

ANI was opened to settlement with the establishment of a penal settlement, in 1857. The activities of the early settlers were confined to a small area, around Port Blair. In order to manage the verdant forests, a Forest Department was established in these islands after 1883. The British used these forests for extracting timber. Working plans, for systematic forest working, were drawn up. Problems began with the partition of India in 1947, when the Island administration had to accommodate a large number of refugees. This led to the working plans being shelved. However, later the forests began to be worked once again in a scientific and systematic manner. Considering the uniqueness of the biodiversity, the administration had established 94 sanctuaries and 9 national parks, to preserve the rare areas. Fifteen protected areas were of special importance, as they conserved specific forest ecosystems and species of fauna. Mr Khan recommended some more areas to be included in the protected area network.

He suggested the following extensions and additions to the Protected Area (PA) network.

- The Mahatma Gandhi Marine National Park (MGMNP), to be extended from Wood Mason Bay up to the southern tip of Rutland Island and to include one kilometre of forest along the coast, as in some places there were Hawksbill (turtle) nesting grounds.
- Possibly, Cinque Island could be considered for inclusion, as it was rich in jellyfish, food for Leatherback turtles. Presently, large-scale fishing takes place there, causing disturbance to the fauna.
- Other areas such as the Grasslands in Teressa / Bampoka Islands, for protecting the Blue-breasted mountain quail.
- The Jackson and Balmia Creek in Little Andaman, for providing protection for brackish water Fauna & Flora.
- A Marine National Park may be created on the west coast of Mayabundar, covering N. Reef Island, Interview Island, S. Reef Island, Bennet Island, and Latouche Island. This should include the sea in between, to provide protection to a range of marine wildlife.

**Dr. Alok Saxena**, the present CWLW, spoke on the management of protected areas in the A&N Islands, and gave an overview. He explained the rich biodiversity of ANI, with the help of statistics. The wildlife wing had two divisions in the Andaman Islands. Wildlife Division I managed the PAs around South Andaman and Baratang and Wildlife Division II managed the PAs in North and Middle Andaman. The PAs in the Nicobar group of islands were managed by an ACF, posted in Car Nicobar.

PAs are currently beset with problems arising out of the exercising of rights and concessions by the human population residing within the PAs. Poaching and other illegal activities, human-animal conflicts, effects of natural calamities, tourism and lack of management plans, were the other issues discussed. The current management practices included giving adequate protection to the PAs, implementing habitat improvement schemes, initiating research and monitoring, and education and awareness projects, introducing eco-tourism, improving infrastructure and introducing capacity building programmes, for the staff.

The constraints faced by the Wildlife Department included the remoteness and isolation of sanctuaries. Many islands were separated by vast stretches of sea. Protection and management of PAs were made difficult due to inadequate and often untrained human-power, and inadequate arms, communication equipment and transport facilities. The Forest Department (FD) felt that there should be more coordination among government departments and other enforcement agencies, and an efficient intelligence network.

The CWLW also explained the various wildlife related schemes being implemented in the territory. There was an ongoing United Nations Development Programme (UNDP) / Government of India (GOI) project on conservation and management of coral reefs in ANI, supported by the Global Environment Facility (GEF). Besides, there was also an eco-development scheme for Swiftlet nest farming, in collaboration with the Salim Ali Centre for Ornithology and Natural History (SACON). He wanted a few major issues to be taken up for further discussion. These included the required focus on the protection of marine life, re-organisation of the PA network, finding alternatives to sand mining, developing sustainable eco-tourism and the management of introduced species.

**Mr T. C. Nautiyal**, ACF, ANI, was the next speaker. He presented a paper entitled 'Status of Protected Areas in Nicobar Islands'. Nicobar has Campbell Bay National Park (426 sq km), Galathea National Park (110 sq km), Galathea Wildlife Sanctuary (11 sq km), Megapode Island Sanctuary (0.65 sq km), Tillongchong Sanctuary (17 sq km) and Battimalv Sanctuary (2.3 sq km). Apart from these, there is the Great Nicobar Biosphere Reserve, with an area of 885 sq km, which has a core area that includes Campbell Bay National Park (NP) and Galathea NP. The remaining area forms the buffer.

He listed some of the important faunal species for which studies have already started viz., the Tree shrew, Crab-eating macaque, Wild pig, Leatherback sea turtle, Box tortoise, Reticulated python, Varanus, Salt-water crocodile, Megapode, Robber crab and Red coral (*Tubipora*). Some important floral species present in the PAs were tree ferns, ground orchids, and rudraksha (*Eliocarpus* sp.). He mentioned some unique features of faunal species, like those of the Crab-eating macaque, found in Great Nicobar and Katchal, but not in other islands. Robber crab habitat was confined to small coastal pockets that were highly endangered and the Megapode was found only in the larger islands of Great Nicobar and Nancowry group.

The Nicobar PAs had a high degree of diversity, but the ecosystem was very fragile. The islands were isolated, which was of great advantage, as there were consequently less biotic pressures on them. The PAs were vulnerable to poachers, who had powerful boats. There were some obvious omissions in the PA network such as, the exclusion of grasslands, which was a unique natural

habitat in Nancowry group of Islands. Human-animal conflict had started with the Crab-eating macaques and the Wild pigs damaging plantations. Feral cats and dogs harmed wildlife habitat. The Nicobarese population was expanding and simultaneously their coconut plantations were also expanding.

The ACF suggested some solutions. He pointed out that sec 65 of Wild Life (Protection) Act (WLA) of 1972 allowed the aboriginal tribes of Nicobar District to hunt wildlife, for their bonafide use. As there was a possibility of misuse or overuse of such a provision, particularly by the Nicobarese, it needed careful scrutiny.

**Dr. Rauf Ali** was the fourth speaker. He presented a paper, prepared jointly with Harry Andrews, on behalf of ANET, titled "Issues Concerning Protected Areas Planning in the Bay Islands".

As a group of isolated islands, ANI had several unique factors affecting them, which would be of no relevance on the mainland. The Tribal Reserves (TRs) were some of the largest protected areas in the islands. Current interventions in the TRs may not be appropriate for ensuring the stability and welfare of the tribal population. The administration has to think of alternate policies.

He listed some of the anthropogenic impacts on the biodiversity of the islands. Almost every household living near the forest was dependent on forest produce collection, for sustenance. There was rampant encroachment on forestland adjacent to villages. This led to the opening up of the forest canopy, resulting in problems of erosion. Encroachment of forestlands also led to the fragmentation of wildlife habitat.

Agricultural productivity of the farmland was declining and the present practice of intensive agriculture, with its use of fertilizers and pesticides, was likely to have a negative impact on avifauna. However, no study on the effect of pesticides / fertilizer on avifauna has been done so far. Sand mining was affecting the beaches.

High immigration from the mainland put pressure on the land resources. Tourists were sometimes found on those islands that were supposed to be closed to the public. There were also many other factors that made PA planning ineffective, such as the lack of species data, lack of archaeological (palaeontological) data and the lack of vegetation mapping.

The scientific factor to be considered while planning a PA network was the 'island effect' and the consequent reduction in areas, which would lead to higher rates of patch extinction. Important to any reserve design, was the creation and maintenance of corridors and 'stepping stones' between existing reserves, to minimize extinction rates. Soon policies would have to be evolved to take care of the issue of feral animals, which are causing much damage to wildlife.

Raising awareness was the key to solving many of these issues. Dr. Ali felt that "armchair environmentalists" created problems because, after having spent very little time in ANI, they gave advice and created problems for the forest department, by going to the press, if their advice was not followed. He hoped that this workshop would not come out with such "pointless recommendations".

**Discussion.** Following these presentations there was a general discussion. A point was raised that the Forest Department (FD) sometimes discouraged research. Though the research findings might not seem relevant now, they may



become so in the future. The CWLW responded by saying that the FD needed more management-oriented research. He gave the example of a request that had been made to grant approval for a research proposal that carried the title *Conservation of Wild pig*, but was about DNA mapping of the pig's gene. Though they allowed it, the research had no real conservation objective.

In response to an enquiry, about why the 'introduced' pig was considered wild now, it was clarified that as it was included in the schedule I in WLA, it had to be protected as an endangered wildlife species.

The Chairperson intervened to say that very often the research findings did not reach the FD. He felt that some agency in ANI should collate all the research findings and send it to the FD. The Chairperson gave an instance of an American getting the patent for using *Phyllanthus amarus* as medicine for Hepatitis B, though it had been used in India for a long time. He felt that we have to inventorise in order to prevent such things from happening.

The next question was on whether any carrying capacity studies were done for fishing, Dr. Rauf Ali answered that no one had done such a study, so far. One of the participants commented that exchange of views should quell the isolation of useful information. He also felt that many people might offer advice on the basis of their past experience, and they should not be dismissed as mere armchair environmentalists.

## **Technical Session II: 1400-1530**

Chair: **Mr S. Theodore Baskaran**, Hon. Wildlife Warden of Tamil Nadu

**Dr D.R.K. Sastry**, Deputy Director of the Zoological Survey of India, made the first presentation on "Endangered and Protected Animals of ANI". He gave a listing of endemic and rare mammals, reptiles, birds and crustaceans. *Echinodermata* are represented by 359 species in ANI and out of them, there are 200 species of reef dwelling forms. Star fish are represented by 79 species, Brittlestars by 87 species and Sea urchins and Sand dollars by 77 species. Holothuroidea have 88 species. They feed on detritus, reduce organic load and bring nutrients to the surface. Mollusca have 1000 species. Pearl oysters have 4 species, edible oysters 2 species, and giant clams are represented by 2 species. Reef building corals are of 63 Genera and 188 species. Much of these marine resources are also of medicinal value. Shell exploitation in 1998-1999 was as follows; Nautilus-115 Kg, King shell-20Kg, Turbo-20Kg, Trochus-515Kg, Lambis-100Kg and Clams-350Kg. Total value of crab and prawn export from the islands add up to Rs. 3.7058 millions.

Dr. Sastry's talk was followed by a presentation by **Mr C. R. Garg**, Director IPT (Information Publicity and Tourism), ANI, on "Tourism and PA management". Mr C.R. Garg explained the economic importance of tourism and the capacity tourism has for generating employment. The segment of tourism that was undergoing rapid growth was *eco-tourism*. It was an environmentally sound activity that contributed to the socio-economic betterment of local populations.

He said that specific steps had to be taken to make tourism conservation-oriented and sustainable. In ANI, most of the tourist spots were within the forest area, so there were many constraints to the development of eco-tourism.

Considering the high growth potential of, and the possibility of employment generation from, this sector, the policy of ANI administration was to develop environmentally sustainable tourism. Being aware of the limited carrying capacity for tourism, the administration intended to promote *high value, low volume* tourist inflow. The administration proposed to follow the tourism plan developed as a part of the UNDP / World Tourism Organisation (WTO) study on environmentally sustainable tourism in ANI. A carrying capacity study, done by the National Environmental Engineering Research Institute (NEERI), had also recommended the implementation of this plan. He gave an assurance that the tourism department was committed to the cause of preservation of a healthy environment.

**Mr Samir Acharya**, representing the Society for Andaman and Nicobar Ecology (SANE) spoke on "Human Habitation and PA Management". Mr Samir Acharya traced the history of the Non-Governmental Organisation (NGO) movement in ANI. He explained that small islands were selected as PAs, because of their remoteness and the difficulty in harvesting timber. However, presently they were not so remote to the poachers, because of powerful boats owned by them. It was also not possible to police the entire PA network. He talked about the impact of agriculture on mangrove and marine ecosystems. Presently, 60% of the settler population was engaged in agriculture. He felt that it would not be easy to find an alternate livelihood for such a large number of people. FD had already started growing bamboo and cane and such plantations should divert pressure from natural forests. If export of fresh fish was permitted, this could also increase income from fishing. He also felt that encroachments should be made a penal offence and that enough forestation was not being done.

He expressed concern about sand mining and said that it should be totally banned. There should be a sustained campaign against the use of concrete as a building material. Use of concrete leads to sand mining, which has a devastating effect on coastal lands and coral reefs. Use of timber as a building material would be more appropriate and should be encouraged. Presently, export of timber has stopped and though timber based industries have also closed down, timber is unavailable for local consumption.

**Discussion.** In answer to a question about private sector participation in the tourism sector, it was stated that that it should be allowed provided it was not destructive to the ecology and environment of ANI. It was also mentioned that there was a policy not to allow tourism south of the 10° channel, and the participants welcomed this.

Dr Untawale drew the attention of participants to the situation in Goa, where there was no proper control over the tourism industry, which had adversely affected both social and environmental values.

The Director, IPT, said that there was a plan to open up certain beaches like North Passage, Mud Island and Radhanagar beach, in Havelock Island.

There was a suggestion to look at the Bhutan model, for making ANI an exclusive tourist destination, with selective tourist inflow. Another participant asked about the exclusion of the not-so-wealthy tourists from the policy of high value tourism. Director, IPT, replied that many middle class tourists were coming now, but they do not generate the expected revenues for the local population. To prevent disparities arising out of income differences, a

suggestion was made to grant permits to people to visit the island on a first-come-first-served basis. Director, IPT, further added that tourism development zones were selected on the basis of the UNDP plan. Many in the audience had seen the plan earlier and expressed their reservations about it. He was asked to circulate copies of the plan and the carrying capacity study conducted by NEERI. He agreed to do so.

### **Technical Session III: 1545-1745**

Chair: **Dr. Alok Saxena**, CWLW of ANI chaired the session.

Director of Fisheries, **Mr Nagesh Ram** was the first speaker. He spoke on "Fisheries and PA management". Mr Nagesh Ram provided information on the status of fisheries on the islands. He said that presently the tribals were the only indigenous fisher folk, and that the pressure on fisheries was mainly around the inhabited islands. About 17% of annual fish catch in the islands came from coral reef areas. Due to lack of good management practices, catch in the coastal areas had depleted and over-fishing had led to degradation of fishing grounds.

The Fisheries Director suggested some remedial measures, including a closed season during breeding period, a no-fishing zone, control over duration and period of fishing, imposition of a fee on fishing, formation of local groups to manage and limit the exploitation of resources, and control on polluting land based activities, like the release of untreated effluents into the sea. He felt that the legal framework should be strengthened to regulate fishing in protected areas. There should be limited licenses issued and fishing boats with licenses should be marked, so that they could be easily identified. He stressed that limiting the landing sites and preventing illegal fishing and fishing in closed seasons and in closed areas, should be strictly enforced. Levying a penalty for contravention of rules and creation of artificial reefs for fishing were the other suggestions given by him.

**Mr Rishikesh Sinha**, from the Pollution Control Board followed, speaking on "Pollution and PA management". He described the role of pollution control committees, which had representatives of various government departments. He stressed the need for increased public awareness in controlling toxic waste and other forms of pollution. He solicited the participation of the public, in keeping the Islands garbage-free. He felt that pollution control laws were not strictly implemented in the PAs. He mentioned that there were no heavy industries in ANI and, so far, no oil spill had occurred in the seas around ANI. He elaborated on the need for laboratories to test samples of toxic waste and mentioned that presently, ANI had no laboratories for testing samples.

**Dr. Kanchan Mukhopadhyay**, Director, Anthropological Survey of India (ASI), Regional Office, Port Blair, spoke on "Tribals and PA management". Dr. Mukhopadhyay traced the history of tribal occupation of the ANI and the changes made, in the land-use policies, by the British, that resulted in the reduction of the tribal population. Prior to the colonisation of ANI by the British, some tribal group occupied every island. Subsequent to the colonization of ANI by the British, the population of the Great Andamanese drastically declined. The Jarawas were forced out of their original home around Port Blair, to occupy

Middle Andamans. Finally, in 1957, some islands areas were declared as tribal reserves. However, encroachment in these reserves, by outsiders, could not be prevented. Also, the original notification declaring the tribal reserves was later modified, reducing them in size. As the Nicobar group of islands did not face such large immigration from the mainland, therefore, the tribal reserves there had much of the original area intact.

Of the five primitive tribal groups, the Sentinalese never faced any immigrants, so they were left alone without any interference. The Andamanese population came down so drastically that their area did not need any management, but the Jarawas and Onges faced many problems in their habitat, due to unauthorized use of resources by settlers, who indulged in poaching and encroachment.

The task of managing the tribal reserves can be seen as the task of protecting the natural reserves, but it is not as easy as one thinks. The offenders who trespass into tribal land are of various types. They may be the unemployed, who go to collect forest resources for commercial purposes, or to collect non-timber forest produce (NTFP) for personal use. Other groups, who are better off, may indulge in game hunting and encroaching inside the tribal reserve. The former group may need some income generation scheme and participatory forestation programme, as alternate source of NTFP. The latter group needs strict policing.

Another important issue raised was that of planning for the management of tribal reserves. In this exercise, tribals are seldom consulted. Some of the groups, like the Onges, have been in a position to make decisions. Even though tribals are recognised to have a deep understanding of the natural environment, they are rarely consulted when their environment is modified and tampered with.

**Discussion.** On the point, whether fishing was allowed in the PAs, it was clarified that legally no fishing could be permitted in a PA. There was a suggestion that there should be a temporary ban on the export of shark fins. Some participants expressed concern on the increasing use of poly-bags and stressed the need for finding an alternative. The participants also felt that the fact that the pollution control committee had no laboratories on the island, to test samples, was a great drawback in monitoring marine pollution.

The tribal question was discussed at length. On being questioned about why exotic fruit species were introduced in the Jarawa reserve, the ASI representative replied that apparently the Jarawas had no food scarcity, but during raids on settlements, Jarawas were reported to be carrying away bananas. This led the Administration to think that by introducing the fruit species, they would get the product in their own reserve and keep away from raiding the gardens in the settlement.

The possible causes of increasing dependence of tribals on the government were also discussed. This dependence could be the result of interfering with their way of life, without anticipating the result. It was debated whether the tribals need to change their way of life. Dr. Mukhopadhyay of the ASI felt that the change, if at all, should be on the basis of an informed decision-making process taking the tribal group into confidence. He felt that the Andamanese and Onges were now in a position to do that.

Chair: **Mr J.C. Daniel**, Bombay Natural History Society

**Dr. Ravi Sankaran**, scientist from the Salim Ali Centre for Ornithology and Nature (SACON), spoke on "Protecting Species and Areas in the ANI - The Perspective of Endemic Fauna". He said that ANI had 0.2% of the geographical area of South Asia but possessed about 12% of its endemic avifauna. These islands form two of the 221 endemic bird areas of the world.

Dr. Sankaran elaborated on the threats to some of the endangered and endemic species. He said that the Nicobar megapode was threatened due to habitat loss and hunting, by both the local people and poachers. This had depleted the population. To save the species, coastal forests need to be better protected and bi-weekly checks need to be carried out of incubation mounds in vulnerable areas. According to him, the Nicobar bulbul was also threatened possibly because of the introduction of the Andaman red whiskered bulbul into the island. A police post had been established in the Tillangchong Island, now a sanctuary, because foreign poachers came there often. Establishment of this post had led to hunting, which put pressure on wildlife. Therefore, intensive patrolling by a powerful boat might be a better alternative to the establishment of an outpost.

According to Dr. Sankaran, the Andaman teal populations were also in decline due to the loss of wetland habitat and due to hunting by the surrounding villagers. Rice cultivators were also encroaching upon wetlands, which were their preferred habitat. Therefore, there was a need to include key wetlands in the protected areas network and, simultaneously, to start educating the villagers living around these wetlands about the value of the species and its current status and threats. Another species under threat was the Edible nest swiftlet, which was also declining in numbers because of the indiscriminate collection of their nests. *In-situ* and *ex-situ* conservation programmes were required for saving the population. Some of the more accessible natural nesting sites needed to be protected and, at the same time, the swiftlets could be induced to build nests in private houses. Owners of such houses could be trained to collect the nests for commercial purposes in a scientific way. This would generate substantial income. Dr Sankaran also felt that there should be a closed season for hunting, as the Nicobar pigeons are decreasing in number, and the sale of air guns and air gun pellets should be banned during breeding season.

He further stated that there was a need to rationalise the boundaries of PAs in the Islands. The Great Nicobar Biosphere Reserve also needs to be redesigned and, in the Nicobar Biosphere Reserve, the national parks should be merged with the pristine forests in the central portion of the island. The areas inhabited by human populations should form the multiple use buffer zone. He added that protecting small islands will help in protecting only a few species. More areas have to be protected on North, Middle and South Andaman. The Jarawa Reserve must also be well protected, as the Jarawas have traditionally been very effective in protecting the avifauna in their territory.

The next speaker, **Dr A. K. Kumaraguru**, Professor in Madurai Kamaraj University, explained the importance of coral reefs. Citing reef statistics for the

entire globe, he said that 600,000 sq km of shallow areas of ocean are covered by coral reefs. They are a dynamic ecosystem. The chemical balance of the ocean is influenced by coral reefs. One atom of calcium takes one molecule of carbon dioxide and corals help in fixing 77 tonnes of carbon dioxide per year. But they are sensitive to changes in the environment. Corals support fisheries production of 9 million tonnes per year. Their fragility and sensitivity, and their vulnerability to over exploitation, makes their protection and conservation a real challenge.

Corals are useful as a genetic resource, as raw material for production of chemicals and pharmaceuticals, and as a protection agent against natural calamities. Pollution, disturbance because of blasting, degradation, and silting degrade the reef. He mentioned the various types and locations of the reefs around ANI.

Dr. Kumaraguru described the coral reef monitoring action plan for ANI, which was sponsored by the Department of Environment and Forests, ANI, and the Andaman Nicobar Centre for Ocean Development. The implementing agencies were the Indian Coral Reef Monitoring Network (ICRMN) and the IOC-UNESCO / UNEP / IUCN / World Bank, Global Coral Reef Monitoring Network (GCRMN), South Asia Regional Component.

**Mr Sarang Kulkarni** of Reef Watch Marine Conservation, an NGO, made a presentation on "Management of Marine Protected Areas in ANI - Mahatma Gandhi Marine National Park (MGMNP), Wandoor - A Case Study". The presentation was based on a study conducted by the Wildlife Institute of India.

MGMNP has various types of ecosystems, like sea grass beds, tropical forests, islands, mangroves and coral reefs. However, the present boundary of the NP covered only the shallow water corals. This was also the case in the Rani Jhansi Marine National Park. Therefore, they should both be surveyed and new boundaries notified, and areas with deep-water corals should be included.

He remarked that the forests of the Manglutan range are degraded, which is affecting the marine ecosystem in the MGMNP. The major land use in the area is plantation / monoculture crops and this is affecting the soil chemistry. Data on village land use and encroachment show Wandoor to be having by far the largest area under intensive agriculture and plantations. Also, the unemployment rate in the villages is around 21% and the unemployed often indulge in poaching. He suggested that ecodevelopment schemes should be started soon.

Kulkarni's study showed that there was heavy tourist pressure on MGMNP. In 2001, on a single day, 414 people visited Jolly Buoy Island. Results of a survey conducted with the tourists showed that 75% of them expressed their willingness to pay a surcharge of Rs. 50 for providing an alternate livelihood resource for the local folk. Money generated thus could be used for funding ecodevelopment schemes for the local people.

Other pressures on MGMNP were due to fishing, especially shark fishing, use of fishing nets, collection of sea cucumbers, hunting and poaching. He listed the priority issues to be tackled, which included prevention of encroachment in the forestland, preventing unauthorized entry and poaching by VIPs, sand mining along the beaches, lack of awareness among the local population, soil erosion and lack of staff capabilities. Ecodevelopment schemes

have to be started soon to benefit the local people. He also remarked that the jellyfish population was exploding.

**Dr. Priya Davidar**, Professor at the Pondicherry University, spoke on “Some Guidelines for the Prioritisation of Sites for the PA Network in the Andaman Islands”. She said that the ANI are oceanic in origin and the biota is young. Unless the forests are protected, speciation will not continue.

Dr. Davidar had been involved in a rapid assessment of birds and butterflies in the Andaman Islands. She had studied bird species of 45 islands and butterfly species of 25 islands. Summarizing the findings of the study, she said that there was a latitudinal gradient in the distribution of vegetation types across islands, due to the occurrence of the north-south gradient in rainfall. The northern islands had a more seasonal climate and drier forests. The proportion of islands with wet forests increased towards the south. The size of the islands also influenced the vegetation type. Wet forests were found predominantly on large islands. As the islands got smaller, the proportion of wet forest area decreased. With the increase in area of the island, the number of forest bird species also increased. Island size similarly affected the species richness of butterflies. Islands with wet forests had significantly more species, than islands without wet forests. Statistical analysis showed that the species present on a smaller island were a subset of species present on a larger island. The results suggested that the PA network should focus on larger islands with wet forests.

The current protected area network in the Andaman Islands consisted predominantly of small islands and was inadequate to protect terrestrial biodiversity. There was a need to include large areas of forests on the larger islands. This guideline should be followed, wherever possible, with regard to notification of additional sites for protection. Forests on large islands should be protected and evergreen and semi evergreen forests should be protected on a priority basis, as they are very rare and endangered habitats.

**Discussion.** A participant suggested that one should look at what happens, when degradation takes place, rather than debating whether it is wet or dry forests that need protection. The response was that if disturbance was not very great, then there was no problem of degradation, but wet forests had to be given higher priority, because they contained more species.

A participant remarked that in the Great Barrier Reef they could trace the climatological history of the region by studying the reef and he wanted to know whether such studies were being done in India. Sarang Kulkarni replied that some similar work had been done in Lakshadweep. To a question about what causes coral bleaching, he answered that it was because of the warming up of ocean waters. On being further queried as to whether ANI were affected, he answered that due to the mixing of ocean currents, which was peculiar to this area, there was no appreciable increase in the temperature of ocean water; therefore bleaching did not affect the corals.

One participant asked why the MGMNP had a boundary line that was straight. The response was that it was so according to an earlier plan, but now it had to be redrawn, as there were more Fauna & Flora beyond the present boundary. A participant had reservations about swiftlet nest ranching. Dr. Ravi Sankaran replied that in Nicobar, some caves where swiftlets build their nests, are on private property and they are the only sites that are well protected. If house farming is allowed, it may ensure that the local people will become

interested, learn the scientific facts behind conserving the bird and will start protecting more populations.

Another participant thought that if larger islands were to serve conservation better, then Narcondam Island, which is very small, would not qualify for protection. He added that smaller islands are very sensitive and that it is difficult, in ANI, to bring under protection large areas, especially those that have existing human settlements. Even if one were to declare the inhabited areas in Nicobar as a buffer zone, it would be difficult for the Administration to meet the requirements of people, especially for non-timber forest produce, from a protected area. Dr. Sankaran felt that as people were not living at present in the buffer zone of the Great Nicobar Reserve, it could be merged into the core area and reserved for future protection.

Sarang Kulkarni was asked whether he had any idea of the amount of sea cucumbers, being smuggled out. He replied in the negative.

### **Technical Session V: 1115-1345**

Chair: **Dr. Chris Magin**, Fauna & Flora International (FFI)

**Dr. A.G. Untawale**, formerly of the National Institute of Oceanography, Goa, emphasized that wherever mangrove forests were found, they should be protected. Island specific management plans for the forests should be drawn to give adequate protection to specific species. Particular importance should be given to buffer zones, while delineating management zones, within the PA. While formulating management plans, due importance should be given to filling the gaps in information. Equal importance should also be given to local participation in the management. He felt that strict protection would be useful for germplasm preservation. He deplored the present lack of taxonomists in the field.

He stressed that, apart from protecting mangrove species, it was also very important to protect sand-dune beaches, and inventorying coral and mangrove species was necessary to understand the ecosystem better. He felt that marine algae might be an important food in the future and recommended that it should be cultivated.

The second speaker at the session was **Mr P.V.Savant**, CCF, who spoke on the "Status of Mangroves in ANI". He gave detailed statistics of the mangrove area and the management initiatives undertaken by the FD for protecting the mangrove forests. The estimated area of mangroves in ANI was approximately 1000 sq km. He gave a break-down of the mangrove area in each group of islands, as well as the floristic composition and faunal wealth of mangroves. Mangroves of ANI were worked in the past by permit holders for extracting fuel wood and poles, and by three plywood factories. The government saw mills also used the wood, and the powerhouse and departmental steamboats used the wood for fuel. However, from a peak extraction of 26,061 tonnes in 1981-82, it had come down to 216 tonnes in 1987-88.

The CCF explained the principles used in formulating exclusive working plans for mangrove areas. It was estimated that 26-36% of the area was under *Bruguiera* species in South and Middle Andamans. Presently, *Bruguiera*



*sexangula* was one of the threatened species. The current conservation strategy was to provide full protection and initiate eco-restoration and forestation schemes. Identifying threatened areas and declaring them as sanctuaries, and checking encroachment for aquaculture in mangrove forests, was next on the agenda. Other priorities in the conservation plan were the preparation of a proper database, initiating awareness campaigns and creating protection zones to maintain genetic diversity.

**Mr Sudarshan Rodriguez**, from UNDP, spoke on issues ranging from PA management to scientific advancement in monitoring techniques. Rodriguez explained the role of UNDP / GEF in the ongoing research on ANI. The structure and relevance of GEF were also described.

ANI coral reefs were studied, using Landsat imageries. Carrying out extensive ground truthing of the area checked the results. Field survey and ground truthing were conducted at Cinque Island, Twin Island, Tarmugli Island, North Reef Island, South Button Island, Henry Lawrence Island and between Neil and Hugh Ross Islands.

Previous surveys done using the same methodology had found 85 species of corals per site, in four locations in the “coral triangle”. This survey showed that an average of 79% of the species were common to the four sites surveyed. Extrapolation of these results suggested that the total number of coral species in ANI could be as high as 404.

Research on the coral reefs of India was being pursued after a gap of twenty years and, now, there was a new generation of marine biologists who were also scuba divers. They were, therefore, personally able to authenticate the findings of remote sensing surveys. He also thought that given the possibility of discovering so many new and additional species of corals in the ANI, it may soon qualify as a World Heritage site.

The project also highlighted some of the major threats to coral reefs. These included improper waste management, disposal of ballast water, bilge and ship waste, and the problem of illegal coral collection.

**Discussion.** A participant commented that in the WL (P) Act there were only two legal entities, namely national parks (NP) and sanctuaries (S) and the concept of a buffer zone had no legal sanctity. It was explained that, in India, there were three types of zonation in and around PAs. First, there were national parks that formed the core zone and had a sanctuary as the buffer zone. In the second case, the PA was entirely a national park or sanctuary, and was itself divided into a core and buffer zone, with the same legal status as the PA itself. In the third case, the PA may be the core and the buffer may be a reserved / protected forest or even non-forest land. However, zones were not currently legal entities but only management tools. It was further clarified that the Great Nicobar Biosphere Reserve had no buffer zone.

Another participant was interested in knowing about the regeneration techniques of mangrove forests. The CCF replied that mangrove species had special niches, for example *Rhizophora* will grow along the waterfront. After checking the adjoining patches of natural vegetation, the species for regeneration are selected and planted in the same order.

Another participant stated that succession and zonation depended on the difference in salinity. He added that many states take up monoculture and this

reduces the biodiversity. He recommended using a mix of different species in regeneration plots.

There was a question for Rodriguez, on whether satellite imagery can show reef slopes and live and dead corals. He replied that with the introduction of new technology of ICONOS, minute details could be accessed.

## **Session VI: 1430-1600**

Chair: **Rom Whitaker**, ANET

**Mr Bittu Sahgal**, Editor of "Sanctuary" magazine, spoke on "laws and policies". He spoke about the existing legal framework and mentioned that we have some of the best laws like the Coastal Regulation Zone Notification (CRZ), the Environment Protection Act and the Wildlife (Protection) Act. However, the problem lies in their implementation and enforcement.

He went on to caution the participants that the direct pressures on forests and biodiversity were not the only things to worry about. According to him, the new economic policies posed far greater threats to the environment. Generation of electricity demanded forest resources and land. Tourism was also a threat to the environment. For example, a new runway was being built in Port Blair, for bigger flights to land in the ANI. The runway itself and the resultant hike in tourist traffic would take a toll of the environment. He commented on the lack of water resources, to cater to the needs of large groups of tourists visiting the island.

According to him, planners claimed that forests have to be cut, if ANI was to be made self-sufficient in power. Water self-sufficiency would mean building more dams. Food self-sufficiency would mean extension of agriculture into forestland. However, these alterations would adversely affect biodiversity. Therefore, coordinated efforts were needed by the Ministry of Agriculture and Irrigation to safeguard the environment and to follow the existing laws.

While implementing the CRZ notification, the forestry staff came up with excellent suggestions for protection. There were Wildlife Wardens who were honest and daring, but political interference was undoing their good work. The NGO sector was doing good work, but some had earned a bad name and had spoilt the reputation of the community, in general. Cooperation between NGOs and government organisations was required. Information sharing was of paramount importance. An integrated approach to management of PAs was required, for which the experience of the mainland was useful.

**Dr. Erach Bharucha**, Director of the Bharatiya Vidyapeeth Institute of Environmental Education, Pune, spoke on the "Status of Infusion of Environmental Concepts in School Curricula and the Effectiveness of its Delivery". Touching on the objective of environmental education (EE), he said that it should lead to acquiring information that would generate awareness. From awareness comes concern for the environment, leading to action. EE was needed for schools, coastguards, policy makers, administrators and forest department personnel. In the ANI, issues to be addressed were the concepts of "hot spots" and ecosystems and who manages diversity.

Dr. Bharucha elaborated on the status of EE in schools in the ANI. He felt that EE was a crucial part of school education, considering the high biodiversity

value of ANI and its vulnerability. Sustainable development should form another important aspect of the education in the island.

During a workshop conducted in the islands, it was found that only 14% of the teachers accessed were conducting environment related activities and only one of the teachers was aware of the uniqueness of the ANI biodiversity. Teachers from both private and government schools felt that the workload was enormous and having EE as a separate subject would add to this burden. The teachers remarked on the lack of time and material, lack of training and management support, as constraints on devoting greater attention to EE. The students, on their part, agreed that they knew very little of the islands' geography or ecology. However, the Nicobari students were aware of their natural resources, but the link between their traditional knowledge and the scientific knowledge acquired in the classroom was not being highlighted by the school curriculum. The conclusion was that the NCERT textbooks followed in the ANI were not specific to the needs of ANI students. They lacked information on island geography, ecosystems, fauna, and flora. Even techniques, like environment impact assessment of development activities, that were vitally important to the needs of this ecologically sensitive area, had not been explained to the future generation.

**Ms. Tara Gandhi**, consultant at IIPA, spoke on “The Anthropogenic Impacts on PAs and Tribal Reserves”. She highlighted the various external anthropogenic impacts on the NPs and Sanctuaries. She showed, with the help of visual medium, the effect of anthropogenic impacts on the PAs. The issues covered were: clearings found inside PAs and inclusion of monoculture plantation in the PAs, besides poaching, agriculture, fire, fuel wood or NTFP (non-timber forest products) collection, introduction of alien species of flora and fauna affecting the health of the PAs. Impacts of habitation, use of vehicles in PAs, effect of tourism and garbage accumulation in the PAs were also discussed.

The impact of development activities such as dams, power plants, industries, mines / quarries, roads and pipelines were discussed. Floods, droughts, cyclones, landslides, earthquakes, volcanic eruptions and climatic change were the natural disasters that also adversely affected Protected Areas.

**Mr Pankaj Sekhsaria**, of Kalpavriksh, spoke about the legal proceedings he had commenced against the Forest Department of the Andaman Administration. The case pertained to the continuation of logging in Little Andaman, the tribal area reserved for Onges, a primitive tribal group.

Sekhsaria talked about the original home of Onges, which covered the whole island and the subsequent de-reservation that made part of the island available for settling mainland immigrants. The relocation of Onges to Dugong Creek resulted from this action. The impact of settlement of outsiders and the working of the forest in the de-notified area by the Forest Development Corporation had resulted in the region being affected by severe erosion. Poachers were entering the reserved area and exploiting the food sources of the Onges. Various studies have shown that the area under the reserve has much more healthy ecosystems. Protecting the Onges and their reserve safeguards the entire biodiversity of the island.

His recommendations were that logging should be stopped forthwith and the Onge reserve should be protected against all illegal activities. This would ensure the protection of the forest and the biodiversity it contained.

**Discussion.** There was very little time left for discussion, as this was a long session with four speakers presenting their views. Dr Bharucha was asked a question about the efficacy of translating existing material on environment education. He replied that his institute produces EE material in Marathi also and that it is important to make sure that EE material is available in local languages and not just in English or Hindi.

## **Discussion on the Biodiversity Bill**

**1615-1730**

The Government of India had introduced a Bill on Biological Diversity, in Parliament. This Bill had been referred to a Parliamentary Committee, which was currently considering it. As there were many participants who felt that this workshop should also discuss the Bill, a special session was organised for the purpose.

There was widespread dissatisfaction with the Bill, as it was currently framed. Some of the major objections were:

1. That it would have the effect of overriding various provisions of the Wild Life (Protection) Act of 1972 (WL Act) and replacing these with much weaker provisions, in terms of biodiversity conservation.
2. That it would make the enforcement of the WL Act difficult or impossible for, as it currently stood, if the wildlife officials were to enforce some of its provisions, they could be prosecuted under the proposed, new, biodiversity act.
3. That it imposed unreasonable curbs on academic freedom and research by insisting that certain categories of publications and research had to be in conformity with government guidelines or required government clearance.
4. That far too much power was being vested in the National Biodiversity Board and that this could result in centralisation of power and its consequent misuse.
5. That there was much duplication of functions and institutions within the proposed act and with other acts.
6. That the proposed act excluded union territories, like the Andaman and Nicobar Islands, from having their own State Biodiversity Boards, and this was not justifiable.
7. That if the bill was to be passed into an act, it must specify that the new act would not overrule the provisions of other acts, especially the WL Act.

It was decided that this matter be raised with the Ministry of Environment and Forests and efforts be made to ensure that the Bill is appropriately amended.

**Plenary Session: 11 July, 2001**

**0900-0930**

Before breaking up into sub-groups, the participants met briefly, in plenary, on the morning of the third and final day of the workshop. They were addressed by **Mr J.B. Jairaj**, Manager, Port Management Board, ANI. He explained the importance of shipping in ANI and the working of the Port Trust. He spoke of the pollution problems and about illegal entry of foreign yachts, carrying tourists. He informed the audience about the precautions being taken by the Management Board to keep the port free of pollution. He particularly mentioned the restrictions imposed on discharge of bilge water, by ships, in the open sea. He said that, despite these restrictions, there were cases of errant ships, but it was difficult to identify them.

He described how, on occasion, yachts carrying foreigners would ask for permission to dock at the port, during the day. On enquiry it was sometimes found that the tourists were based in one of the far-eastern countries and were taking a day cruise. At present, there seemed to be no law to prevent such visits.

He added that the coral reefs of ANI were a great tourist attraction, but the income generated went to other countries. This fact elicited many questions. The session had to close soon, as the subgroups were to meet and come out with their respective recommendations.

**Sub Groups Meetings: 0900-1230**

### **Subgroup A: Scientific Research and Monitoring Priorities**

Co-ordinators: **Mr J.C.Daniels and Dr. Rom Whitakar**

The group deliberated on the subject and identified the following priorities.

#### ***Priorities Related to Coral Reefs***

- Mapping the entire extent of coral reefs.
- Preparing a database for coral reefs (to be undertaken by the FD).
- Water quality monitoring and pollution monitoring in the reef area.
- Monitoring of critical species at 19 sites (the organizations who offered to monitor were Reef Watch, Pune University and National Institute of Oceanography).
- Identification of proper management models for tourism.
- Finalisation and implementation of the draft monitoring-plans prepared by ICRMN and GCRMN (To be done by the Ministry of Environment and Forests).

#### ***Priorities Related to Mangroves***

- A status survey of mangroves.
- Setting up of the Mangrove Research Institute.
- Island-wise mapping of mangrove forests.
- Investigating the possibility of introducing mariculture.

#### ***Priorities Related to Species***

- As the Andaman Teal and the Crocodile were endangered species, wetland surveys to be undertaken to assess their habitat loss.

- As the Megapode was among the most endangered species, survey and protection programmes to be initiated.
- Andaman crane, Wood pigeon, Narcondam hornbill and Nicobar shikra were the other endangered species, and surveys for habitat loss needed to be undertaken.
- Other endangered fauna included dugongs, sharks, soft shells and groupers. They needed to be surveyed and monitored.
- It was important to design a time-bound programme to eliminate introduced species, such as deer, elephant, feral cats and dogs.

#### ***Gaps in Knowledge***

- Knowledge of what existed in the past (archaeology / palaeontology) should be studied.
- Studies of tribals and their needs should be carried out in order to formulate appropriate policies for the Tribal Reserves.
- Survey of medicinal plants and ethno-botanical surveys were not currently available and needed to be carried out.
- Mapping of the distribution of rare Fauna & Flora was needed.

#### ***Human Based Problems***

- Carrying capacity studies were required to determine the sustainable level of fishing, tourism, forest working and human population. The carrying capacity of coral reefs also needed to be determined.
- Environmental impacts and the potential for agroforestry of cane and rattan, and the use of alternative building materials for replacing sand, including the treatment needed to make timber last longer, should be focussed on as a priority.
- Encroachment into forestland with the expansion of settlements had increased. Therefore, there was a need to determine how much area had been encroached and what steps should be taken to minimise this threat.
- Section 65 of WL (P) Act 1972 allowed all scheduled tribes of Nicobar to hunt wildlife. The Nicobarese had increased in number and many were presently educated and were employed. As they were no longer dependent on hunting turtle and megapode eggs for food, there was a tendency to over exploit these resources. The provision of the Act needed reconsideration.

#### ***Development Programmes***

- Model site-specific ecodevelopment schemes have to be implemented for the disturbed sites, keeping in view the endangered-species or habitats.
- Educational curriculum development for environment education was an urgent priority, to build up a responsible future generation.
- *In situ* and *ex situ* swiftlet conservation had to be undertaken to save the species from extinction.

### **Subgroup B: Policy, Law and Planning Priorities:**

Co-ordinators: **Dr. Chris Magin and Dr. Alok Saxena**

**Mr Vishnu Pada Ray**, Member of Parliament from the islands, was a special speaker at this session. The views expressed by him have been incorporated in the sub group recommendations. The main points of his speech are given below.

- Panchayats wanted forests to be fully protected. The elected members of the Panchayati Raj Institutions were fully supportive of this.
- The administration had identified 1367 cases of pre-1978 encroachment, but many other cases had been left out.
- Compensation should be paid on time for damage done by departmental and feral elephants.
- Quarrying should be opened up and use of quarry dust instead of sand mined from beaches in construction should be encouraged.
- There was a 90% dropout of school children in 10th standard, as compared to near 100% enrolment till then.
- To check influx of people from the mainland, a cut off date must be agreed upon for giving resident status.
- The Forest Department must give wood to local furniture-making units and for construction of wood-based houses.
- The relationship between locals and the forest department was not good.
- There was often collusion between poachers and forest staff.
- Providing wood, especially to school dropouts, would provide employment to them.
- Crocodile farming, deer ranching and orchid cultivation could enhance incomes, while ensuring nutritional security.
- Promotion of eco-tourism would generate employment and income, while protecting the biodiversity of the islands.
- There was immense potential for sustainable harvesting of sea cucumber and mud crabs.

The sub-group then deliberated on the topic assigned to them. They recognised that planning priorities and sectoral development policies for the islands had a great influence on the capacity to conserve the biodiversity of the Islands. The subgroup went on to identify some of the threats to the ecosystems of the islands and recommended priority strategies to combat such threats. The following thrust areas were identified.

#### ***Agriculture***

- Soil conservation was identified as a major issue, because of depleting soils and the negative impact of soil-rich run-off on the corals. The subsidy to farmers for undertaking soil conservation measures needed careful planning. The existing scheme of subsidy-to-loan at the ratio of 1:1, with a repayment period of five years, had not worked effectively. Many farmers who became defaulters were automatically debarred from getting the subsidy. This resulted in such farmers not undertaking soil conservation measures.
- Soil erosion and the run-off of rain water have to be prevented. Non-point silt erosion could be tackled by local vegetation bunds.

- Since agriculture in the islands was essentially rain-fed, use of pesticides needed to be curtailed drastically. Integrated pest management, using bio fertilizers, had been recommended.
- It was also felt that agriculture should not become the main occupation of the islanders. The area of 50,000 hectares currently used for agriculture could not be expanded indefinitely, without large-scale diversion of forestlands for agriculture. This would have serious implications for soils and soil fertility. Intensive multiple tier agriculture was suggested as a way out.
- Species to replace paddy, that could arrest soil erosion, had been identified. Cultivation of horticultural crops, cane, bamboo and medicinal plants could be taken up.
- Collaborative social forestry with Panchayati Raj (local self-government) Institutions, and joint forest management, had immense potential. The agriculture-forestry interface and its interconnection with marine waters should be the guiding principle, in the agricultural strategy for the islands.

### **Fisheries**

- Fisheries should be made more attractive, with provisions for deep-sea fishing, cold storage and marketing back up. This would help generate employment for local people. Value addition to fishery products may be done by on shore processing of the fish catch.
- There was an urgent need to start awareness campaigns regarding restrictions on fishing.
- An area exceeding 100,000 sq km could be sustainably harvested, by encouraging local people to fish. Additionally, such fisher-folk could act as informers to the forest department and the Coast Guards.
- Historical time series data on the species composition of fish catches and their current status could help in developing standards for sustainable fish catch for each species. This was very important, keeping in mind the declining trends in global fish catch.
- No sea going fishing trawlers should be allowed, except those run by the Fishery Corporation of India.
- The occupational pattern of settlers revealed that 20% were fisher-folk from the mainland. They had stopped fishing in their current settled life. Cultivation was considered a high profile occupation, whereas fishing, which was done by landless people, was considered a low status occupation. By taking the steps mentioned above, it is possible to promote fishery as a respectable option.
- Technology transfer is a must to modernise fishing techniques.
- The Fisheries Act urgently needs a closer scrutiny so that it is reviewed in the light of current ground realities.

### **Tourism**

- Though ecotourism had become a 'buzzword', experience in many protected areas had shown that at the ground level, nothing much had changed.
- Since foreign tourists were not many, the current problems arising out of uncontrolled tourism in the islands pertained to Indian tourists. Since



- ship fares were highly subsidized, the influx of tourists did not contribute much towards overall revenues.
- Moreover, looking at the way many seaside tourist locations had been utterly mismanaged from the ecological viewpoint, it would be worthwhile to restrict tourism to very precisely defined locations. It was not only the number of tourists that needed to be checked, but also the place from where they came.
  - Also, high value, low volume tourism would discriminate against Indians. Moreover, consumption patterns of such high value tourists would also pose problems of solid waste management and garbage disposal.

***Other priorities***

- Minor irrigation, currently handled by the PWD, should be under the charge of the Forest or Agriculture department.
- High value spices should be exported and food crops imported.
- Floriculture and orchid cultivation to be encouraged.
- The growing of medicinal plants on the forest floor has to be explored.
- Adequate legal cover should be given to prevent exploitation of sea cucumbers and corals, especially those found outside protected areas.
- Manage the introduced species like deer and elephants (both departmental and feral) in accordance with scientific principles to be determined after a study of their impact on the vegetative cover.
- Logging should be stopped in and around the tribal reserves.
- Reorganisation of the existing PAs should be done in a way that clusters of islands be designated as a single PA, by including the sea area into the PA network.
- Pre-1978 encroachment of forest lands, by farmers, should be regularised.
- Improved patrolling of PAs should be undertaken by the Forest Department, for better protection.
- A system of checks, like work permit and identity cards to control influx of people from the mainland, should be tried.

**Plenary: Presentation of Sub-Group Reports**

**1230-1315**

Chair: **Mr B.S. Sajwan**, Managing Director, Andaman & Nicobar Islands Forest Plantations and Development Corporation Ltd.

**Mr. J.C.Daniels** and **Dr. Alok Saxena** presented the recommendations of the subgroups.

**Valediction: 1400-1500**

The Valedictory function was held soon after the lunch break. **Dr Alok Saxena** and **Dr. Rauf Ali** presented the report of the workshop. They touched briefly on the proceedings of the workshop and the recommendations of the subgroups, which were already dealt with in detail, by the respective coordinators. They

thanked all the participants, who had contributed so significantly to the discussions, and the organizers of the workshop from the Forest department, ANET and IIPA. They also thanked Dr. Chris Magin, Fauna & Flora International, and the Darwin Initiative, for all the support extended to the various research projects and the workshop.

**Vice Admiral O.P. Bansal** delivered the valedictory address. His knowledge of the environmental issues in ANI was much appreciated by the participants. He hoped that at the conclusion of the workshop, where so many experts had participated, “some tangible, focussed and implementable road map would have been charted”. He said that implementation was the key to success and unless the general public got involved and compelled the executive and the judiciary to act, this valuable heritage will be lost forever. Mobilising public opinion was necessary to achieve this goal.

He felt that some of the laws, such as the Coastal Regulation Zone and those related to Forest Protection, have to be made more appropriate to the specific situation in the Islands. He elaborated on the environmental problems faced in the ANI and felt that deterrent and exemplary punishment was called for if the situation was to be improved. He commended the expertise, knowledge and skills possessed by various research institutes, but deplored the lack of ability of the authorities to enforce the laws. The Forest Department, according to him, required more teeth and more means to do their duty efficiently. He suggested infusion of technology, rather than increase of manpower, for achieving the goal. Since other agencies like the Navy and the Police had certain facilities, he recommended that the forest department take the initiative and bring everybody together, especially at the field level, and strengthen protection efforts.

He concluded by assuring the support of the Navy to other government agencies, in safeguarding the ecology and environment of the Andaman and Nicobar Islands.

**Dr. Chris Magin** of FFI concluded the workshop by thanking the various Government Departments and participating scientists for their cooperation and useful suggestions. The workshop concluded with a relaxing field visit to the Chiriya Tapu beach.

## ANNEXES

### Annex 1

#### List of Participants

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## Annex 2

### Workshop Schedule

#### Monday, 9 July 2001

- 0915 Bus will leave Megapode Nest for workshop venue
- 0930-1000 Registration of Participants
- 1000-1045 Inauguration
- Welcome to the Participants: **P.V. Savant, CCF, A&N Islands**
  - Introduction to the Workshop: **Shekhar Singh, Project Director, IIPA**
  - Inaugural Address: **Balbir Singh, Chief Secretary, A&N Islands**
  - Vote of Thanks: **Alok Saxena, CWLW, A&N Islands**
- 1045-1100 Tea/Coffee
- 1100-1300 Technical Session I – **Chairperson: P.V. Savant, CCF, A&N Islands**
- Overview of PAs in the Andamans
    - **I.H. Khan (20 mins)**
    - **Alok Saxena (30 mins)**
    - **T.C. Nautiyal (20 mins)**
  - Major Issues in the Management of PAs in the Andamans
    - **Rauf Ali/Harry Andrews (30 mins)**
  - Discussion (20 mins)
- 1300-1400 Lunch
- 1400-1530 Technical Session II – **Chairperson: Theodore Baskaran**
- Floral Diversity of PAs in the Andaman Islands: **BSI (20 mins)**
  - Faunal Diversity of PAs in the Andaman Islands: **ZSI (20 mins)**
  - Tourism and PA Management: **C.R. Garg, Director, IPT, A&N (20 mins)**
  - Discussion (30 mins)
- 1530-1545 Tea/Coffee
- 1545-1745 Technical Session III – **Chairperson: Alok Saxena, CWLW, A&N Islands**
- Fisheries and PA Management: **Director of Fisheries, A&N Islands (20 mins)**
  - Industries, Pollution and PA Management: **Utpal Sharma, Director, Industries, A&N Islands (20 mins)**
  - Tribals and PA Management: **Kanchan Mukhopadhyaya, Director, ASI (20 mins)**
  - Human Habitation and PA Management: **Samir Acharya, SANE (20 mins)**
  - Discussion (40 mins)

## Tuesday, 10 July 2001

- 0630-0830 Field Trip
- 0930-1100 Technical Session IV – **Chairperson: JC Daniels, BNHS**
- Scientific Issues in the Management of PAs in the Andamans
    - Speakers/Presenters**
      - **Ravi Sankaran (15 mins)**
      - **Sarang Kulkarni (15 mins)**
      - **A.K. Kumaraguru (15 mins)**
      - **Priya Davidar (15 mins)**
  - Discussion (30 mins)
- 1100-1115 Tea/Coffee
- 1115-1345 Technical Session V – **Chairperson: Chris Magin**
- Scientific Issues in the Management of PAs in the Andamans (...contd.)
    - Speakers/Presenters**
      - **Pankaj Sekhsaria (15 mins)**
      - **A.G. Untawale (15 mins)**
      - **P.V. Savant (15 mins)**
      - **Sudarshan Rodrigues (15 mins)**
  - Discussion (30 mins)
- 1345-1430 Lunch
- 1430-1600 Technical Session VI – **Chairperson: Rom Whittaker**
- Issues of policy, law and Management Planning related to PA Management in the Andamans
    - Speakers/Presenters**
      - **Bittu Sehgal (15 mins)**
      - **Erach Bharucha (15 mins)**
      - **Tara Gandhi (15 mins)**
  - Discussion (30 mins)
- 1600-1615 Tea/Coffee
- 1615-1730 Discussion on the Draft Biodiversity Bill
- 1800-1900 Films on the A&N Islands to be screened at the office of the IP&T

## Wednesday, 11 July 2001

- 0900-1100 Meeting of Sub-Groups
- Subgroup A** – Scientific Research and Monitoring  
Priorities: **Co-ordinated by J.C. Daniels and Rom Whittaker**
- Subgroup B** – **Policy, Law and Planning Priorities:** Co-ordinated by Alok Saxena and Chris Magin
- 1100-1115 Tea/Coffee
- 1115-1230 Meeting of Sub-Groups (contd..)

- 1230-1315 Presentation of, and discussion on, sub-group reports –  
**Chairperson: B.S. Sajwan, Managing Director, ANIFPDC Ltd, A&N Islands**
- Presentation of Sub-Group reports
  - Discussion on Sub-Group reports
- 1315-1400 Lunch
- 1400-1500 Valediction
- Presentation of Workshop Report: **Dr Rauf Ali, ANET**
  - Summing Up: **Alok Saxena, CWLW, A&N Islands**
  - Valedictory address – **Vice Admiral O.P. Bansal**
  - Vote of Thanks: **Chris Magin, FFI Representative**

## FIELD VISIT SCHEDULE

### ***Saturday, 7 July 2001***

#### VISIT TO MOUNT HARRIET NATIONAL PARK

Departure at 1030 hrs from Megapode Nest with packed lunch  
 Reach Wright-Mayo at 1145 hrs  
 Visit of Mangrove creeks 1145 hrs to 1300 hrs  
 Departure for Mount Harriet at 1300 hrs  
**Arrival at Mount Harriet at 1400 hrs**  
 Lunch  
 Visit of Mount Harriet at 1430 hrs  
 Tea at 1630 hrs  
 Departure for Port Blair at 1645 hrs

### ***Sunday, 8 July 2001***

#### VISIT TO MARINE NATIONAL PARK

Departure at 0930 hrs from Megapode Nest  
 Arrival at Wandoor at 1030 hrs  
 Visit to Grub Island from 1030 hrs to 1230 hrs  
 Lunch at Wandoor at 1230 hrs  
 Departure for Port Blair at 1330 hrs

#### VISIT TO LIGHT & SOUND SHOW IN CELLULAR JAIL

Departure 1850 hrs from Megapode Nest  
 Show begins at 1915 hrs  
 Return to Megapode at 2030 hrs  
 (subject to weather conditions)

### ***Tuesday, 10 July 2001***

#### VISIT TO CORBYN'S COVE

Departure at 0630 hrs from Megapode  
 Return to Megapode at 0845 hrs

***Wednesday 11 July 2001***

VISIT TO CHIDIYATAPU

Departure at 1500 hrs from Van Sadan

Arrival at Chidiyatapu at 1600 hrs

Tea at 1730 hrs in Chidiyatapu

Departure for Port Blair at 1745 hrs

FFI-A&N Workshop Report-FinalFinal  
2 October 2001