

# Livestock-based Livelihoods

An action programme for the Andaman and Nicobar Islands

Proceedings of the Seminar held in Port Blair, Andamans

23-24 November 2006



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anhra



Compiled and Edited by Dr. Nitya S. Ghotge

Editorial assistance:  
P.K. Jayanthan

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Mr. Pankaj Sekhsaria , Dr. Rauf Ali, CARI, Port Blair and  
ANTHRA

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Dr. Nitya S. Ghotge  
ANTHRA  
F, Lantana Gardens, NDA Road, Bavdhan, Pune 411 021  
anthra.pune@gmail.com  
www.anthra.org

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# Contents



Executive Summary	5	<b>Livestock Development Programmes on the Islands</b>	
Organizers and Collaborators	11	Tsunami Rehabilitation Programme	
Introduction and Setting	13	<i>Dr. S. Naveen</i>	33
<b>Inaugural address</b>		Nicobari Fowl: A Unique Germplasm of Andaman and Nicobar Islands	
<i>Dr. R.C. Srivastava</i>	18	<i>Dr. A. Kundu and Dr. T. Sujatha</i>	36
<b>Presentations</b>		Livestock and Poultry Germplasm of Andaman and Nicobar Islands with special reference to Nicobari Pig	
<b>Ecology and Environmental Considerations</b>		<i>Dr. S. Jeyakumar and Dr. A. Kundu</i>	38
Communities of the Andaman and Nicobar Islands, their Livelihoods and their Dependence on Local Biodiversity		Status of Livestock and Poultry Diseases in Andaman and Nicobar Islands	
<i>Mr. Samir Acharya</i>	19	<i>Dr. Jaisundar</i>	39
Ecology of the Islands		Livestock Farming as an Alternative Economically Viable Enterprise for Farmers of Andaman	
<i>Mr. Pankaj Sekhsaria</i>	22	<i>Dr. B. Ganesh Kumar</i>	41
Invasives in the Andaman Islands: An Update		<b>Strategy and Action Plan for Livestock Development</b>	33
<i>Dr. Rauf Ali</i>	26	<b>Annex 1: List of Participants</b>	33
The Importance of Biodiversity		<b>Annex 2: Bibliography</b>	33
<i>Dr. Nitya S. Ghotge</i>	31		





# Executive Summary

A two-day seminar entitled Livestock-based Livelihoods: an Action Programme for the Andaman and Nicobar Islands was organized during 23–24 November 2006 in Port Blair, Andaman and Nicobar Islands, India.

The seminar was jointly organized by ActionAid, a humanitarian relief aid organization which has been active in the Islands since the Tsunami struck, and ANTHRA, an organization working on livestock development. The seminar brought



together people from different disciplines. The main objective of the seminar was to highlight different aspects of livestock care, to discuss and deliberate on an action plan for its development on the Islands and to formulate a suitable course of action to be followed to enhance and enrich the livelihoods of the people, which depend on agricultural and livestock resources.

The seminar was inaugurated by Dr. R.C. Srivastava, Director, CARI. In his inaugural address he raised the very important issue of drinking water for livestock and said that this must be factored into any future plans prepared for the Islands.

The morning session of day 1 was devoted to environmental considerations of livestock programmes. Mr. Samir Acharya, SANE, Port Blair; Mr. Pankaj Sekhsaria, Kalpavriksha, Pune; Dr. Rauf Ali, FERAL, Pondicherry; and Dr. Nitya Ghotge, ANTHRA, Pune, spoke in the session.

Mr Samir Acharya raised concerns about the development programmes that were devised for the Islands with scant concern to the local environment. He drew attention to the fact that the indigenous communities did not rear

livestock. It was in fact the Nicobarese who brought livestock to the Islands. He cautioned against bringing in varieties of livestock from the mainland as they were likely to adversely affect the ecology of the Islands.

Mr. Pankaj Sekhsaria said that it is important to understand the historical context before formulating any environmental plans for the Islands. He highlighted the key environmental and conservation issues including poaching, sand mining, introduction of exotics (which put further pressure on the available natural resources of the Islands), population explosion, as well as skewed development plans. He expressed concerns on the inadequacy of post-Tsunami development and rehabilitation programmes. The reconstruction and housing programmes introduced new construction materials from the mainland which actually promoted sand mining of the beaches.



Dr. Rauf Ali spoke on invasives and their impacts on the Islands. He talked on the different kinds of exotics which had been introduced on the Islands and the resultant problems to the local environment. He urged for the establishment of legal measures to prevent and control the spread of invasives in the Islands.

Dr. Nitya Ghotge's presentation highlighted the social, cultural, economic and environmental uses of biodiversity. She referred to the International Convention on Biological Diversity to which India is also a signatory. She highlighted the major threats to biodiversity including natural disasters like the Tsunami. Post-disaster programmes failed to pay sufficient attention to biodiversity. Dr. Ghotge strongly emphasized on the negative impacts of certain intensive and commercial activities that are damaging the Islands' environment.

The afternoon session was devoted to the problem of livestock rearing on the Islands. Dr K.A. Naveen from the Department of Animal Husbandry spoke on the Tsunami rehabilitation programme. An amount of Rs 4.06 crore has already been disbursed to tribal farmers as part of the rehabilitation package under the SGSY scheme of the Government. Efforts to compensate the remaining farmers, who had lost their livestock, will be undertaken over the next three years. However, he talked of the bottlenecks to the rehabilitation of the affected farmers. Several of them are yet to be rehabilitated. There had been heavy loss of fodder resources and grazing land due to the Tsunami. This has adversely affected the livestock rearing.

Dr A. Kundu made a presentation on the Nicobari fowl. Locally known as 'takniet hyum', meaning short-legged chicken, these birds are a highly endangered species of the Andaman and Nicobar Islands. These are the highest egg producers amongst all indigenous breeds of India. These are resistant to diseases such as Mareks and New Castle (Ranikhet). The government's efforts to distribute the Vanaraja breed from the mainland would endanger this species even more.

Dr S. Jeyakumar talked on the Nicobari pigs and the research being conducted by CARI on the present status of this unique breed. Dr Jaisundar spoke on the diseases affecting the livestock of the Islands. It was heartening to know that fatal diseases such as Rabies, found on the mainland are not present on the Islands. Import of livestock and livestock products including feed has, therefore, to be done very carefully. An epidemic struck the Islands earlier is in fact suspected to have been triggered off by the import of contaminated feed. Dr B. Ganesh Kumar made a presentation on livestock rearing. He highlighted the possibility of grooming this as an alternative economically viable enterprise for the people of the Andamans.

A major concern which emerged in the presentations and discussions was that the most vulnerable families had not yet been properly rehabilitated. They did not have the means to rear livestock, especially large stock like cattle. In the absence of proper housing for the farmers themselves, it was not possible for them to provide adequate shelters to animals. In many areas such as Campbell Bay and Hut Bay several heads of cattle had been found abandoned. Many

families were reluctant to take new animals since they did not have the means to maintain them. Although the relief programmes included the distribution of fodder and grass seeds, the implementation has not been very successful. The issue of procurement of stock for distribution was raised by many speakers. There was hardly enough livestock on the islands to cater to all the families. Further, there were several problems in importing livestock from the mainland.

On the issue of Fodder availability the recommendations included (a) to conduct a survey of waste lands, (b) explore the possibility of leasing panchayat lands, (c) introduce intercropping of different varieties of fodder, (d) explore alternative feed services.

Day 2 began with a presentation by Dr. Nitya Ghotge on the study conducted by ANTHRA in December 2005 on livestock related to local livelihoods. She spoke on the different types of livestock found on the Islands and their method of rearing. She highlighted the major constraints



of livestock rearing. These include lack of enough native breeds, scarcity of fodder due to failing agriculture, damage to agricultural lands, and saline ingress in agricultural lands due to the Tsunami. She said that it was not advisable to import fresh livestock from the mainland as it could increase the risk of diseases and contaminate existing local gene pools, especially of poultry and pig. Any agency implementing livestock-based programmes must take into consideration local resources, local knowledge base, local constraints as well as ongoing programmes being initiated. She presented ActionAid's current efforts on supporting livestock development which included support to farmers' groups to rebuild livestock shelters, to restock animals of their choice and to organize training programmes on livestock care.

In the brainstorming that followed, the participants discussed the various programmes that could be implemented.

The recommendations included (a) the rearing of large animals, such as cattle and buffalo, are to be

promoted only where agriculture was sound and water was available in plenty (b) goats are not to be promoted in areas where they could destroy natural biodiversity and vegetation and (c) guidelines on the minimum requirements for different species of livestock must be drawn up which could serve as a base for chalking out future programmes. Strategies for insurance were also worked out.

Detailed discussions were held on the strategies to conserve the two established breeds; the Nicobari pig and poultry. Detailed action plans were also drawn up. The agricultural situation on the Islands, especially in the Tsunami-affected areas, was precarious. It was suggested that studies, such as the status report on agriculture, be widely circulated. Fresh studies on land use may be conducted to develop norms for social uses of land. Excessive land use for tourism should be curbed. Studies on cropping patterns and marketing of livestock produce must be carried out.





On the issue of Fodder availability the recommendations included (a) to conduct a survey of waste lands, (b) explore the possibility of leasing panchayat lands, (c) introduce intercropping of different varieties of fodder in existing plantations, and (d) explore alternative feed services including fish and coconut meal. Discussions were held on integrated farm livestock models. These were recommended as demonstration units on different islands.

With regard to animal shelters, it was recommended that concerns on livestock be factored into the reconstruction programmes. Their requirements must be adequately planned when designing new homesteads. The use of locally available material for constructing livestock sheds was strongly recommended.

Another important recommendation was on conducting training programmes on organic livestock rearing and management of biowaste for families rearing livestock.





# Organizers and Collaborators

## ActionAid

ActionAid has been actively working to restore lives and livelihoods of the Tsunami-affected people in Andaman and Nicobar Islands. Promotion of sustainable livelihoods is one of their major programmes. This project plans to promote activities in several sectors like agriculture, fishery and animal husbandry. The projects aim to promote different livestock-based initiatives in the near future.

## ANTHRA

ANTHRA is a resource group founded by a team of women veterinary scientists to address the myriad constraints that faced rural livestock rearers. It has offices in Pune and Hyderabad. ANTHRA works for sustainable livestock production within the larger framework of building people's food sovereignty and livelihood security. The focus is actively to protect and strengthen indigenous knowledge and cultural diversity. Their areas of work include farming and production systems, crops and fodder varieties, livestock and plant genetic resources, medicinal plants and health care traditions, and land and water use.

## ActionAid's activities in the livestock sector

ActionAid conducted a feasibility study on the promotion of sustainable livestock in the Andaman and Nicobar Islands in 2005. The Islands have a unique and fragile ecology. Any unplanned intervention can have far-reaching adverse impacts on the Island's biodiversity. The study was conducted in collaboration with ANTHRA in the wider context of sustainable natural resources use. Some of the key recommendations of the study are as follow:

- To give due consideration to local resources and knowledge in livestock promotion activities
- To develop viable integrated mixed livestock farming systems which can be successfully managed at the households level
- To establish interlinks with agricultural programmes to promote suitable fodder linkages
- To protect and promote local breeds like Nicobari pig and Nicobari fowl as these are the last existing genetic pools of these unique breeds
- To promote insurance of livestock assets
- To help communities rebuild livestock shelters
- To conduct studies on markets for livestock produce

After the Tsunami in 2006, ActionAid largely focused on programmes to help affected households rebuild livestock shelters and restock livestock of their choice. ActionAid has taken a careful and cautious approach to highlight economic, social and environmental considerations.

### **Support for livestock shelters**

Affected families were given Rs 2500 each to construct suitable shelters for livestock they wished to rear. In some cases, such as in the Sundarpur settlement in Little Andaman, farmers got together in groups and constructed a single large shelter by pooling in all their resources. The shelters have been built using local materials.

### **Support for restocking of animals**

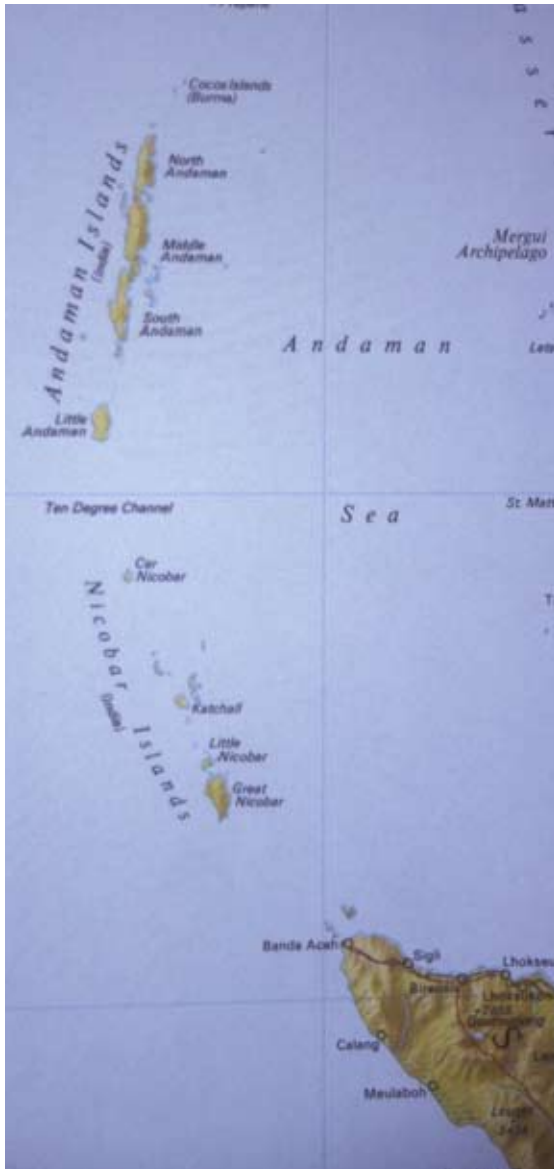
Families were given an initial capital of Rs 3000–5000 to purchase animals. Andaman has mixed communities having differing preferences in rearing livestock. Choice of livestock was left to the farmers.

### **Training programme**

A five day training programme on livestock health care and management practices was organized by ANTHRA in Mitha kari village. The participants were selected from villages where ActionAid works. Thirty people attended the programme.



# Introduction and Setting



## Location

Located in the South Eastern part of the Bay of Bengal, the Andaman and Nicobar Islands form the southern-most tip of the Indian subcontinent. They are a group of 572 islands of which only 36 are currently inhabited. The total geographical area of the Andaman and Nicobar Islands is 8249 sq. km. North to South the islands cover a distance of 800 km. The northern-most tip is barely 100 km from Myanmar and the Southern-most islands approximately at the same distance from Indonesia. On the other hand, mainland India is about 1000 km away.

## Administrative unit

The Andaman and Nicobar Islands are a Union Territory. Their capital Port Blair lies in the South Andamans. There are two districts, Andaman and Nicobar, seven Tehsils, and 547 villages, of which 501 are inhabited.

The agricultural land is around 50,000 ha, i.e. about 6% of the total area of the Islands. The average rainfall in the Islands is 3180 mm per annum.

## Natural resources

The Andaman and Nicobar Islands have a unique ecosystem. Eighty five per cent of the land is covered by forests. The tropical evergreen littoral forests are very special with many rare, unique, and diverse plant, animal, and marine life.



Over a period of time the introduction of new species and varieties of plants and animals has started creating stress on the ecosystem. Some of the animals introduced were elephants, brought in to help the timber and logging industry, and deer brought by the British. Goats were brought by different settlers. The African snail was introduced by the Japanese as a food supplement. Plant invasives introduced into the Islands include *Lantana camara*, Subabul, congress grass and water hyacinth (Sekhsaria 2002 and Ali 2003).

## A touch of history

The oldest known inhabitants of the Islands are the Great Andamanese, Jarawas, Sentinelese, Onges, Nicobarese, and Shompen. Most of the different tribes on the islands today live in reserve forests. The number of the Great Andamanese, Jarawas, Onges and Sentinelese has been reduced to a great extent. Classified as primitive, they

are not really in contact with the modern world except occasionally for supplies. The Nicobarese who largely inhabit Car Nicobar and other southern islands are, however, in contact with the outside world.

The Great Andamanese, Jarawas, Onges and Sentinelese are said to have inhabited these islands for more than 20,000 years. It is not clear when the Nicobarese and the Shompen groups arrived in the Islands. Next came the colonizers, missionaries and their animals, the British, the Dutch, and the Danish. The British started a penal settlement and built the infamous Cellular Jail in Port Blair in 1858. Individual supporters of India's freedom struggle as well as entire tribes whom the British classified as criminals were banished to the Islands. During the Second World War the Islands were occupied by the Japanese till October 1945. Finally in 1947 the Islands became a part of Independent India.

After the British left, the prisoners were rehabilitated in the Islands. Prisoners of war during the Japanese occupation between 1942 and 1945 were also settled in the Islands. In 1972 the Government rehabilitated people from the mainland and some groups from Bangladesh. Army personnel were also given land in the southern-most islands, such as Great Nicobar, to encourage settlements and to establish an Indian colony. They were given land for cultivation as well as for building homes.

As time passed, people from different states of India such as Tamil Nadu, Kerala, and Andhra Pradesh, as well as people from Myanmar, migrated to the Islands. Labourers were brought from tribal areas around Ranchi to work on the plantations and sawmills started on the islands after Independence. When the sawmills were

closed down in 2002, these communities stayed back.

Today these beautiful and enchanting islands of unexploited beaches and forests are a popular tourist destination drawing scores of Indian and foreign tourists every year.

The varied culture brought by the different groups which have occupied these islands forms an interesting pattern. Villages present a mix of cultures and practices of agriculture, livestock rearing, and life styles brought from the mainland. Each group tried to replicate a slice of their homeland in the Islands.

### **Livestock on the islands**

The early settlers; the indigenous tribes like the Onges, Jarawas and Sentinelese, did not rear livestock. The Nicobarese, who are believed to have arrived in the islands much later, however, began rearing pig and poultry. The pig plays a very important role in Nicobarese society and culture. It is represented in every important event. Although pigs are raised under open range–semi feral–systems, they are extremely well cared for. Coconuts from the plantations of Nicobarese form an important part of the daily nutrition of pigs. These pigs also root in the nearby jungles.

However, exotic varieties of pigs were introduced among the local population, which diluted the genetic purity of the local breeds.

The Nicobarese poultry is the breed reared by this community. It resembles local birds except it has shorter legs. There are many scientific reports which show that this bird is resistant to most

local diseases and requires little maintenance. It is the best egg layer in India with a laying capacity of 160 eggs per year.

European colonizers also brought livestock to the Islands. Over two hundred years ago cattle were brought in by the Danish which have since gone feral on some of the islands. Goats were brought in by the Dutch on Theresa Island. These are now known as Theresa goats.

Later settlers brought many more species of livestock into the Islands such as cattle, buffaloes, goats, pigs, poultry, and ducks, to supplement and support their lifestyles and livelihoods. Thus it can be seen that almost all the livestock in the islands were introduced from outside. They are of mixed and varied breeds according to their place of origin.

Subsequently, under various livestock development programmes, exotic breeds of pig, poultry, and cattle were also introduced in the Islands.

### **The impacts of Tsunami on the lives of the people**

The Tsunami, preceded by an earth quake, which hit large parts of the coastal areas of South and Southeast Asia on 26 December 2004, devastated large parts of the Andaman and Nicobar Islands as sea water literally swallowed the islands. Some of the worst-hit islands were South Andaman, Middle Andaman and Nicobar. People living on the coasts were the most affected. Communities who lived close to the sea were relocated to shelters away from the shore. However, even today, two years after the incident, people are scared the ocean may come to gobble them up again.



The Tsunami which hit large parts of the coastal areas of South and Southeast Asia on 26 December 2004, devastated large parts of the Andaman and Nicobar Islands as sea water literally swallowed the islands.

### ***Loss of agriculture***

Besides battering homes, sea water flooded rice fields and destroyed the crop which had just begun to ripen. Coconut and other plantations were destroyed. Saline water continues to remain in the fields even now. Options such as salt tolerant rice are being tried. Provision of sluice gates to allow water to drain away is being made. Currently cropping is being practised in the high lands, but agriculture in general has taken a beating. In the Nicobar Island, especially Great Nicobar, aid and relief facilities are slow to reach due to their remoteness and distance from Port Blair. People continue to live in temporary shelters there. It is impossible to return to their home or farm lands. An intrepid few have dared to return but life has been very difficult.

### ***Loss of livestock***

The Tsunami affected livestock rearing to a great extent. On the one hand large numbers of livestock perished, and on the other, animal shelters and land for growing fodder were destroyed. Unable to look after the animals while residing in temporary shelters, many people had to abandon their livestock, especially cattle and buffalo, in areas affected badly. This problem is particularly acute in Great Nicobar.

The government estimated a loss of 1,57,600 heads of livestock due to the Tsunami. In financial terms, this translates into Rs 30.68 crore. The Government of India allotted Rs 11.83 crore to compensate this loss. Another Rs 26.70 crore has been proposed to be distributed by the Union Territory administration. This is to help them replace the livestock assets as well as to regenerate fodder supplies. In some areas the government has begun to redistribute Vanaraja and Girirani varieties of poultry. These, however, have not fared well. In the absence of shelters and infrastructure, people are unable to raise their animals properly. Scarcity of fodder is another major problem in the islands to manage and maintain high yielding varieties of animals.

### **Loss of livestock due to Tsunami**

<b>Name</b>	<b>Numbers</b>
Cattle	3,786
Goat	16,623
Pig	38,446
Poultry	98,722



## Workshop on livestock-based livelihoods

ActionAid and ANTHRA organized a two-day seminar entitled 'Livestock-based livelihoods: An action programme for the Andaman and Nicobar Islands' during 23-24 November 2006 at Port Blair. The main objectives of the seminar were to bring in different perspectives related to livestock care including critical environmental concerns, to discuss and deliberate on an action plan for livestock development on the Islands and to formulate a suitable course of action to enhance and enrich the livelihoods of people dependant on agricultural and livestock resources.

Livestock rearing programmes are considered the best option for restoring the devastated livelihoods of the people especially since agriculture has suffered a severe setback. Today natural disasters are even viewed as opportunities for starting livestock programmes of a particular kind. Unfortunately, this is neither easy nor feasible as they do not take into account important equity and environmental issues.

The objectives of the seminar were to highlight different perspectives related to livestock care including critical environmental concerns, to discuss and deliberate on an action plan for livestock development on the Islands and to formulate a suitable course of action to enhance and enrich the livelihoods of people dependant on agricultural and livestock resources.

The livestock development programmes to be implemented need to consider the local ecology, biodiversity, cultural preferences of the stakeholders, markets, etc. The Andaman and Nicobar Islands have a unique and delicate ecology. They are home to several unique indigenous varieties of livestock such as the Nicobari fowl and Nicobari pig. Careful planning needs to be done on any programme to support the livelihoods of the affected communities, and ecological considerations of the Islands should not be compromised at any cost.



# Inaugural Address

**Dr R.C. Srivastava**

*CARI*

Livestock rearing is extremely important in the lives of rural households, especially small farmers, in the Andaman and Nicobar Islands. The requirement of water for livestock was often not taken into consideration. Livestock rearing is generally managed by women and the income from this activity also goes to them.

Natural disasters cause great loss to livestock. Over a lakh heads of cattle were lost in Orissa in the 1998 cyclone. In the Islands too, livestock are part and parcel of the lives of marginal farmers. These were a major casualty during the Tsunami. It is very necessary to compensate for this loss by replacing the existing livestock with better breeds or upgrading these. The environmental problems of rearing improved species of animals need to be taken into consideration. Medicinal plants could be used to handle several managerial problems and such uses should be encouraged.

*Agriculture must become a dignified livelihood. Rural youth of the Islands must be partners to the process of growth.*

I would like to draw your attention to the need for future studies on carrying capacity. Groundwater becomes scarce in the summer months. Assessing the requirements of water for livestock is necessary. Water harvesting systems for farming households should also be carefully established. Studies to assess the local and external markets to determine the uptake of livestock and their products also need to be undertaken.

It is necessary for livelihoods to go beyond mere subsistence levels. About 60% of our farmers are above 50 years of age and the remaining 40% are ready to give up farming. How long can farmers and farming continue like this? Agriculture must become a dignified livelihood. Rural youth of the Islands must be partners to the process of growth. They should also get a share in the economic boom which is expected from tourism. "Science and social sciences have to work together."

# Presentations

## Ecology and Environmental considerations

The session on 'Environmental concerns' was included in the seminar to bring in environmental perspectives into the strategy programme. Given the unique nature of the Islands the environmental concerns need to be carefully considered. Three well known environmentalists with considerable expertise on the Islands' environment and ecology, Mr. Samir Acharya, Dr. Rauf Ali, and Mr. Pankaj Sekhsaria, made presentations. While discussing the special environmental conditions of the Islands, they stressed the need for cautious and careful developmental planning for the Islands which would ensure that the existing biodiversity and environmental conditions would not be compromised. The final presentation in this session was done by Dr. Nitya Ghotge on the importance of biodiversity.

# Communities of the Andaman and Nicobar Islands, their Livelihoods and Dependence on the Local Biodiversity

**Samir Acharya**

*SANE*

I believe in the right of self-intervention. I am neither a scientist nor a researcher. I am an interested layman, perhaps a little too interested. I have been here for a very long time. I would like to share my prejudices, ideas, and thoughts with you. I will touch upon some issues.

I will now tell you a small story. In Burma an American company was trying to implement a human excreta treatment system for which 50,000 dollars was invested, with the condition that only their experts were to be hired. An expert from MIT or Harvard came and studied the area. He came back quite impressed saying that the system in the rural areas were quite good. He took his team to the bamboo machan in which there was a hole to defecate in. Pigs ate the human excreta. The excreta of pigs entered the river and were eaten by fish. Finally, humans harvested and ate the fish!

I would like to draw your attention to the musical scale and my perception of these with respect to the Islands.

*Doe* – Full of deer, introduced for meat and entertainment. The deer in Andamans are a pest.

*Re* – Primary energy provider, a drop of golden sun. We have abundant rain and sun which we must harness and use in the natural way.

*Me* – The biggest problem. Mass deaths, pestilence and proliferation of human population which is also like exotics that come from the mainland.

Three studies were carried out on the human population of the Islands. The first was during the days of Mrs. Indira Gandhi which stated that the Island should not carry a population of more than 2.5 lakh. The second was by Satish Chandran Nair who reconfirmed these conclusions. The third study was carried out by Mr. Srivastava. He said the population could increase to 4.5 lakhs under certain conditions. After the Tsunami the population has gone up way beyond the recommended limits. If the population growth continues unabated, where will the original inhabitants of the Islands, such as the Shompen, Jarawa and Andamanese go? Skewed and hybrid policies lead to skewed and hybrid development. The reconstruction of houses, as per the Supreme Court order, must be on local designs, using local material. Everybody is upset that the Supreme Court order also restricts cutting of timber. Every family is

allowed 30,000 mm<sup>3</sup> of timber which can be cut. But as yet no timber has been cut. Despite these generous provisions, large companies have been brought in from the mainland to re-build houses damaged by the Tsunami. These new houses will not last even for two or three years. Such housing would not be suitable for either humans or livestock.

Skewed and hybrid policies lead to skewed and hybrid development.

The concept of composite farming was promoted by WHO in the late 1950s and 1960s. This encouraged the use of mixed farming systems such as agriculture and livestock. The crop residue from agriculture was fed to cattle,



whose dung was used as manure. The grains from agriculture were fed to poultry and their droppings collected in a pond in which fish were raised. This fish could then be used for human consumption. This cycle encouraged maintaining chicken and/or ducks and a fish pond. These were good for energy recycling if natural balance is maintained. It is necessary to be rich in resources rather than cash. The desire to build a trunk road was for transporting material. What is the need for such development that cut the Andaman Islands into two? Even the British constructed buildings using local material only. But the Indian government is now pushing material from the mainland for development and reconstruction.

The early inhabitants of the Islands were completely dependant on the forests and did not rear livestock. The Nicobarese were amongst the last indigenous communities to arrive on the Islands. They brought livestock such as pig and chicken with them and thrived, but depended on the natural ecosystem for feed and fodder. Subsequent settlers also brought livestock such as cattle, buffalo and goat with them and began rearing these. It is unwise to bring varieties of livestock from the mainland as they are likely to severely compromise the Islands' ecology.

Nature's ability to cope with man's mishandling of its resources is going down.

The book titled *Gaia* written by James Lovelock says that the whole earth is like an organism and has the habit of repairing itself. Its sequel, *The Revenge of Gaia*, also says that the Earth is like an organism and it is also stressed like an



organism. The human race has angered Gaia. We should bear in mind that nature's ability to cope with man's mishandling of its resources is going down. The removal of even a single tree might cause local extinction. We must be very cautious and learn from nature. We should not over-use or over-exploit natural resources. The book *Collapse* written by Jared Diamond speaks about the collapse of societies and communities because of over-use of natural resources.



# Ecology of the Islands

**Pankaj Sekhsaria**

*Kalpavrikhsba*

For formulating a plan we have to understand the context and history of the place. In the case of the Andaman and Nicobar Islands, the 570 islands are an island system with large tropical forests. The Andamans are considered to be extensions of

the submerged Arakan Yoma mountain range of Myanmar. They are a part of India by a historical accident. The 26 December 2004 disaster was the first such incident in the memory of the Islanders. The legend has it that during the great cataclysm, the Islands were submerged and broken into several islands to form the present state.



The key environmental features of the islands are characterized by high habitat diversity.

- Tropical Forests (high endemism) – littoral; pandanus species found
- Mangroves (about 1000 sq. km) – support marine diversity



- Sandy Beaches (turtle nesting sites) – four endangered sea turtles were found on the island. Faulty development can further endanger these species.
- Coral Reefs (200 species, 2000 sq. km) - high diversity

Very little has been documented about the Great Nicobar Biosphere reserve. It probably contains a lot more biodiversity than is known. The *Vanda terres* orchid is a signal plant which indicates opening up of the canopy cover of a forest. The other examples of biodiversity specific to the Islands are the Andaman day gecko, the megapode, the fiddler crab, the giant robber crab, and the giant leather back turtle. This vast biodiversity needs to be accounted for in the development process.

Introduction of animals into the Islands have actually created problems. For example, dogs have proliferated in large numbers. They dig up nests of turtles and destroy their eggs. The African giant snail was introduced by the Japanese as a source of protein. These snails have now proliferated and spread to all the islands and are a major threat to vegetable crops.



Some of the key conservation issues to be considered are:

- Commercial forestry: The cutting of naturally grown trees for any ongoing projects in the Islands, except for plantation wood, has been prohibited by the Supreme Court. In fact each family is permitted 30,000mm<sup>3</sup> plantation wood which comfortably takes care of their requirements.
- Poaching: Poaching, including international, on species such as sea cucumber and crocodiles is a major problem.
- Sand mining: In earthquake-prone zones like the Islands, concrete buildings are extremely vulnerable. The excessive use of sand for concrete structures in turn leads to excessive sand mining.





- ♦ Exotics: The introduction of exotics such as the chital, dogs and elephants were now causing problems.
- ♦ Population explosion: Population explosion on the Islands is causing extreme pressure on resources and jobs.
- ♦ Andaman Trunk Road: The much debated road cuts through the Jarawa inhabited reserve forests and threatens the habitat and lifestyle of the Jarawa community.
- ♦ Tourism: Tourism will put further pressure on the delicate balance between different resources of the Islands.
- ♦ Encroachments: Encroachments by settlers from the mainland into reserved areas must be stopped.

- ♦ Education: Education should be based on needs and systems of the place. For instance, swimming could be made compulsory in the curriculum.
- ♦ Indigenous people: The original inhabitants of the area and their close links to the environment should be kept in mind. The reserved area marked for these communities were some of the best forests.

The development plans for the Islands after Independence envisaged clearing of 60,000 acres of forest land, settlement of 12,000 families on agriculture (including plantation, horticulture, etc.), establishment of an integrated industrial complex based on timber resources, and the

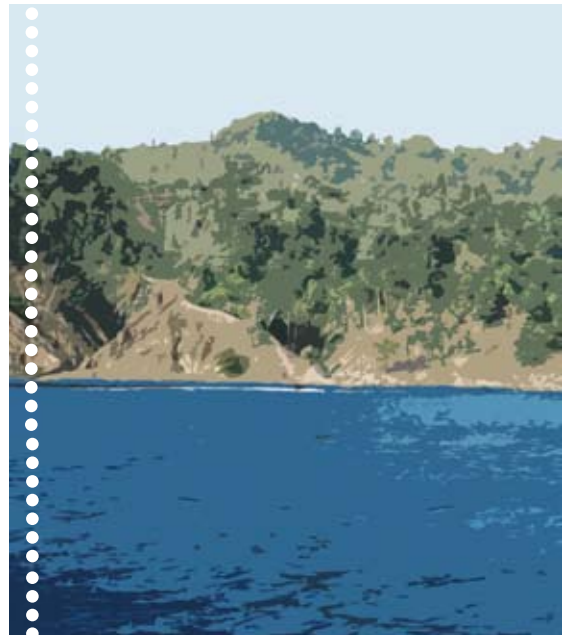


establishment of a sugar factory with an annual capacity of 60-70 thousand ton. These development plans saw the indiscriminate extraction and exploitation of forest resources. Further, the rapid increase in population of the Islands led to further problems.

These development plans saw the indiscriminate extraction and exploitation of forest resources. Further, the rapid increase in population of the Islands led to further problems.

The ecological problems resulting from the Tsunami were the following:

- Disposal of debris such as plastics in which relief materials were brought in.
- Materials, technologies, and processes used in reconstruction and rehabilitation. A major concern is that the local communities were not being consulted in the process and houses were being built using materials from the mainland. This also facilitated the influx of more people from the mainland. Instead, there was need to involve the local communities in the design and construction process.
- Plantation belts and the construction of bunds were also important ecological concerns which need to be considered.



# Invasives in the Andaman Islands – An Update

Dr. Rauf Ali

FERAL



A brief introduction to Invasive Alien Species (IAS), prepared earlier<sup>1</sup>, will not be repeated here. In this paper I will concentrate on the specific issues raised by invasive species that are now present in the Andamans. I will also focus on policy issues that need to be addressed in reducing the problems caused by invasive species. I would like to stress that islands are far more vulnerable to the presence of IAS than mainland areas. So developing a policy for the islands is of much greater priority than developing one for the mainland. It will also be a totally different policy,

having elements that the mainland policy will not have.

## Damage Caused

Specific to the Andamans, several effects have been seen due to the presence of exotics. These include damage to native vegetation due to grazing and browsing by exotic herbivores, presumed effects on the population of birds because of competition for nestholes by exotics, the alteration of lake and marine characteristics due to the presence of exotic plants, attacks on agricultural crops, the homogenisation of biota (in other words, the number of species in an area reduces due to the presence of exotics), and unintended side effects of biocontrol agents. No attempt has been made to date to quantify the damage or estimate its economic cost, either in the Andamans or in any other part of India.<sup>2</sup>

## Bird Invasives

There are three main bird IAS recorded from the Islands.

*The House Crow (Corvus splendens)* is endemic to the Indian subcontinent. It has travelled on ships to other parts of the world, and is now found in

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1 Ali, R. (2003) Issues relating to invasives in the Andaman Islands. Paper presented at the BNHS CJS Seminar, Mumbai, November 15, 2003

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2 It is worth repeating that the US alone suffers a loss of \$137 billion annually due to invasives.



East and South Africa, Zanzibar, the Seychelle Islands, and Singapore. It is a nuisance, and is known as a disease vector.<sup>3</sup> It attacks the eggs and nestlings of other birds causing their decline. It is also an agricultural pest and damages crops.

Seven crows were sighted in Port Blair in 2003, and are believed to have come aboard one of the ships from mainland India. They were observed roosting in Gandhi Park (R. Sankaran, personal communication). This was then brought verbally to the notice of the Forest Department, and a request was made that they be eradicated. This advice was ignored. Today the population must be about 50, and their main roost appears to be on a large pipal tree near Aberdeen village. Unless urgent eradication measures are taken immediately, the problem is going to become unmanageable.

It is instructive to see what other countries have done. Singapore has a shooting programme, and it is estimated that about 41,000 crows have to be culled annually to keep their population to a manageable number. Aden eradicated over 200,000 crows in two years; unfortunately, it was

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3 Brooks, B.W. *et al.* (2003) Abundance and projected control of invasive House Crows in Singapore. *Journal of Wildlife management*, 67: 808-817



recolonised from adjacent areas. The Seychelles offered a bounty of \$100 per dead crow, and there it has been completely eradicated.<sup>4</sup>

*Common Mynah (Acridotheres tristis)* compete vigorously for nesting holes with local species and this may lead to their decline. While this aspect has not been studied in the Andamans, the same is almost certainly the case here. Locally, populations of Glossy stare may have got affected. They also have been reported to prey on the eggs and nestlings of pigeons and gulls. They also cause damage to agricultural and horticultural crops, and are considered among the world's worst 100 invasive species.<sup>5</sup>

*House Sparrow (Passer domesticus)* is now found in the vicinity of Port Blair, and has not been reported from elsewhere. It is known as an agricultural pest, and may compete with local endemic bird species for both food and nesting sites<sup>6</sup>. More study is required for this and the

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4 [http://www.env.gov.sc/html/alien\\_invasive\\_species\\_animal.html](http://www.env.gov.sc/html/alien_invasive_species_animal.html)

5 <http://www.issg.org/database/species/ecology.asp?si=108&fr=1&dsts>

6 <http://www.issg.org/database/species/ecology.asp?si=420&fr=1&dsts=sss>



species mentioned earlier on the best control methods.

### Invasive Mammals

There is a long and growing list of invasive mammals. The wild ones include chital (*Axis axis*), elephant (*Elephas maximus*), five-striped palm squirrel (*Funambulus pennanti*), barking deer (*Muntiacus muntjac*), brown rat (*Rattus norvegicus*), black rat (*Rattus rattus*) and house mouse (*Mus musculus*).

Of these, the impacts of both the elephant and the chital have been studied. Chital degrade forest vegetation. Natural regeneration has almost stopped in a number of places where they are found.<sup>7</sup> On Ross Island, where their population has grown to high densities, there is very little ground vegetation, and the soil has become degraded. The chital have begun eating garbage, leading to unjustified complaints that the Government is not doing enough to feed them. However, it is obvious that artificial feeding will enhance the population even more, and increase

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7 Ali, R. (2004) The effects of introduced herbivores on vegetation in the Andaman Islands. *Current Science*, 86: 1103-1112. Can be downloaded from [www.ias.ac.in](http://www.ias.ac.in)



the pressure on the food resources available. The garbage eating will still continue.

Elephants are found on Interview Island where the vegetation has been destroyed due to the damage caused to trees by them. The population of elephants seems to have crashed recently.<sup>8</sup>

The other species of mammals have not specifically been studied in the Andamans. We can, however, make informed deductions about their effects based on studies elsewhere. The squirrels are seed predators and are likely to alter forest structure. Rats are a problem everywhere, especially so on small islands. They are known to transmit leptospirosis, which is known as 'Andaman Fever' here. The many endemic rodent species in the Islands are likely to get affected by the presence of introduced rats and mice.

Control measures for both elephants and chital are indicated as a priority. The elephants could be translocated back to mainland India. Safe technologies for tranquilising and transporting have been developed elsewhere. This would account for the bulk of the animals, and the few adult males left behind could be sterilised.

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8 Ali, R. (2005) An update on the elephants of Interview Island. *J. Bombay Natural History Society*, 102: 221-223



While India has ratified the Convention on Biological Diversity, it has failed to implement the sections dealing with invasive species. It is conspicuous in being one of the few countries in the world that do not have an invasive species policy in place. Compounding the problem, the Wildlife Act actually hinders the control of invasive species.

In the case of chital, total eradication is necessary. It is, however, protected by the Wildlife Protection Act, making its control problematic. It is also found in protected areas, and hunting it in these areas would also be a violation of the law. A few meetings have been held to discuss this. Unfortunately, the problem has encountered the CFCC (cute, fluffy, cuddly and charismatic) syndrome.<sup>9</sup> The reference quoted here gives an excellent introduction to the problems encountered while trying to control IAS.

Of the others, controlling rats requires a long and sustained effort. It may not be possible to eradicate them completely, especially in the urban areas. It is worth pointing out that a recent

exercise to catch a rat in Norway on a 9.5 ha island took four months in spite of intensive trapping and poisoning efforts.<sup>10</sup>

### Domestic Animals

Domestic animals pose another problem. This is especially so when they go feral. This information has been summarized elsewhere<sup>2</sup>. It is important to control feral dogs at least on beaches where sea turtles nest. Also, goats need to be eliminated from Barren Island.

It is interesting to note that goats have reportedly been eradicated from Narcondam, following a plea that they were destroying habitat there. (R. Sankaran, personal communication). A word of caution is necessary. Like rats, the last few goats are very difficult to spot and eradicate, and constant monitoring must continue at Narcondam to ensure that they have actually been completely eradicated. In situations like this, "Judas goats" have been used with success elsewhere. A tame goat, fitted with a radio collar, is released and then tracked. Since goats are social animals, it will join up with the few remaining goats, leading hunters to them.<sup>11</sup>

Potential harm can also come from introduced fish. At a seminar here in 2003, much interest was shown in a fish that puts on several kilogrammes of weight within three months.<sup>12</sup>

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10 Russell, J.C. *et al.* (2005) Intercepting the first rat ashore. *Nature*, 437: 1107

11 Campbell, K. and C.J. Dunlan (2005) Feral goat eradications on islands. *Conservation Biology*, 19: 1362-1374

12 Kesavan, C. (2003). In "Expanding and deepening the role of the NGOs/Voluntary Sector in the A and N Islands". Workshop, 25th-26th February 2003, Port Blair. Andaman and Nicobar Administration, Port Blair.

9 [http://www.cabi-bioscience.ch/wwwgisp/gtc5\\_8.htm](http://www.cabi-bioscience.ch/wwwgisp/gtc5_8.htm)

## Biocontrol Agents

I will now briefly touch upon another controversial area. Department of Agriculture in the Andaman and Nicobar Islands has established a State Biocontrol Laboratory.

This laboratory has the laudable goal of introducing Integrated Pest Management into the islands. The laboratory is currently testing egg parasitoids, larval parasitoids, pathogens and predators of insect pests.

However, some of these parasitoids, pathogens, and predators affect nontarget organisms as well. *Trichogramma* wasps are known to affect butterflies which are not necessarily insect pests. Ladybird beetles affect other native beetles. I, therefore, hope that the State Biocontrol

Laboratory is doing detailed studies on nontarget organisms, and monitoring the spread of these biocontrol agents in the wild, besides assessing

their ecological effects.<sup>13</sup> The website<sup>14</sup> does not suggest that these tests are being done, and if they are, the Biocontrol Lab should set an example and put all the details on their website.

## Recommendations

While India has ratified the Convention on Biological Diversity, it has failed to implement the sections dealing with invasive species. It is conspicuous in being one of the few countries in the world that do not have an invasive species policy in place. Compounding the problem, the Wildlife Act actually hinders the control of invasive species.

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13 van Drieschel, R.G. and M. Hoddle (1997) Should arthropod parasitoids and predators be subject to host range testing when used as biological control agents? *Agriculture and Human Values*, 14: 211-226

14 <http://agri.and.nic.in/biocontrol.htm>



Setting up a task force by the centre to elucidate an invasive species policy is an urgent need. Andaman and Nicobar administration should also immediately implement plans to control some invasives. Some actions to be taken immediately would be:

- + eradicate chital
- + translocate feral elephants from Interview Island
- + eradicate goats from Barren Island
- + eradicate house crows
- + ensure that IPM measures do not affect non-target organisms.

Meanwhile a policy specific to the Islands, dealing with all aspects of introduction and control of new species to the Islands, needs to be evolved.



# The Importance of Biodiversity

**Dr Nitya S. Ghotge**

*ANTHRA*

Biological diversity is an umbrella term used to describe the number, variety, and variability of living organisms in a given assemblage. It includes wild and domesticated species. The single-most obvious pattern in the global distribution of species is that the overall richness increases with decreasing latitude.

In 1992 in Rio de Janeiro, Brazil, the world's nations agreed to a global Convention on Biological Diversity (CBD). It aims to protect the world's biological resources from further extinction or at least to slowdown the rate of extinction. India is a signatory to the CBD. Much of the biodiversity lies in the developing world/ southern countries and they need to be protected and conserved.



Biodiversity has social, cultural, economic, and environmental uses.

Major threats to biodiversity are:

- Habitat destruction or change, urbanization, expanding agricultural activities, and livestock rearing
- Market forces: local, national, and international
- Policies, laws, Acts, and legislations
- Disasters, epidemics, floods, cyclones, earthquakes, Tsunamis
- Introduction of new species and invasives

### **Impacts of disasters on biodiversity**

Disasters, especially natural disasters like Tsunami, cause habitat destruction, loss of agricultural land, increased salinity, as well as loss of species, especially of domesticated livestock. Relief measures often recommend the introduction of exotics which are seen as an economic opportunity. However, this may be a limited and narrow view without taking into account various hidden costs, market externalities, and subsidies. There can be negative

environmental consequences too if the new species does not adapt to the environment, makes unsustainable use of the resources, or makes increased demands on already stretched resources. Such programmes do not also take into account the existing social and cultural preferences or needs. Judgments or premises are made based on preconceived notions. For example, that dairying is the only alternative when large communities may have no regional preference for milk or may not have the fodder base or water availability to support this activity.

Biodiversity-sensitive livestock rearing must, therefore, take into consideration local needs, preferences, and constraints, and market forces - positive and negative. Other more suitable options should also be considered.

Economically too, livestock-based activities, if intensified, or if pushed towards commercialization, can become extremely dependant on energy, fodder, water, and veterinary services. These costs need to be borne by the system.

### **Hazards of commercial systems**

#### ***Poultry***

- Utilizes only one or two breeds of poultry thereby compromising biodiversity.
- Needs high quality feed, cereal, grains, proteins, etc., thus competing with other species for food.
- Pollutes the environment with their wastes by concentrating them on one spot.



- Can be instrumental in the wide spread of infectious diseases, eg. avian flu.

### *Dairying*

- Needs large quantities of good quality water.
- Requires good quality fodder and grass production, pasture land (one animal needs up to 30 kg grass per day).
- Concentrates wastes in one area.
- Needs to develop marketing linkages, otherwise it can lead to problems

Biodiversity-sensitive livestock rearing must, therefore, take into consideration local needs, preferences, and constraints, and market forces - positive and negative. Other more suitable options should also be considered.

# Livestock Development Programmes on the Islands

## Livestock and Livelihood Considerations

Livestock rearing is an important livelihood activity for many communities living on the Islands, especially those who have migrated here or have settled here after Independence. Closely linked to agriculture, this activity is practised on different scales by different communities. However, only the Nicobari pig and Nicobari poultry are considered native to the Islands. The other animals such as cattle, buffalo, goat, duck and some varieties of poultry were introduced later.

The ICAR (Indian Council of Agricultural Research) has an important station called CARI (Central Agricultural Research Institute) in the Islands. CARI's mandates are

- (a) to provide a research base to improve the productivity of important agri-horticulture, livestock and fisheries of Andaman and Nicobar Islands,
- (b) to conduct adaptive and basic research for attaining economic self-sufficiency,
- (c) to develop appropriate plans for conservation of natural resources and their sustainable use, and

- (d) to standardize technologies for animal health coverage and livestock production systems. CARI has initiated various studies on the local breeds, some of which were presented at the seminar.

A large number of livestock were lost during the Tsunami. The maximum damage happened in the Nicobar group of islands. Another problem is that of abandoning of animals after the disaster, especially cattle, many of which have since turned semi-feral. The Animal Husbandry Department of the Union Territory was responsible for providing compensation for lost livestock. This has not been an easy task. Enumeration of actual loss, providing suitable animals, organizing feed and fodder to maintain and sustain these animals, all have been fraught with difficulties. These problems have been further complicated by the Island's ecosystem, the sheer remoteness from the mainland, the lack of infrastructure and facilities, as well as lack of proper guidelines for post-disaster livestock programmes to be followed in an area as unique as the Andaman and Nicobar islands.

# Tsunami Rehabilitation Programme

**Dr K.A. Naveen**

*Animal Husbandary Dept., Andaman and Nicobar Administration*

## Objectives

- Treatment and control of animal diseases
- Improvement and expansion of the animal husbandry activities and veterinary services
- Providing gainful employment to rural masses especially the weaker sections of the society
- Augmenting production of milk, egg and meat.

## Plan programmes

- Expansion of
- animal health programme

- livestock development
- animal husbandry programme
- fodder development programme

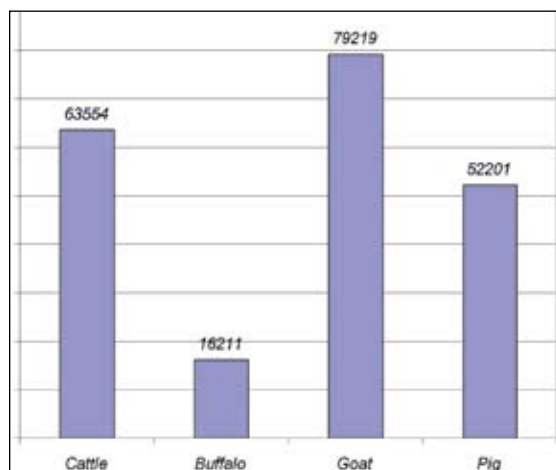
## Centrally sponsored schemes

1. Integrated sample survey of major livestock products
2. Assistance to states/UTs for the control of animal diseases
3. National project for Rinderpest eradication
4. Foot and Mouth disease control programme
5. Professional efficiency development
6. Assistance to states/UTs for the conduct of livestock census
7. Assistance to state poultry farms
8. Conservation of threatened breeds (Theresa Goats)

## Infrastructure status of the Andaman and Nicobar Islands

Institutions	Original (Nos.)	Damaged during Tsunami (Nos.)
Veterinary hospitals	9	1
Veterinary dispensaries	14	1
Veterinary sub-dispensaries	49	8
Disease diagnostic laboratories	8	1
Mobile veter\nrinary clinics	8	2
Livestock farm	8	3
Hatcheries	5	2

## Livestock Population as per 17th Quinquennial Livestock Census - 2003



Total number of Poultry 930878

### Livestock lost in Tsunami

Cattle	3786
Goat	16623
Pig	38446
Poultry	98722

### Rajiv Gandhi Rehabilitation Package – Animal Husbandry Sector – chronology of events

- January 2005 – Central team assesses losses
- February 2005 – Indian government announces relief package for animal husbandry sector: Rs. 11.83 crore compensation for lost livestock; Rs. 10.14 crore supply of feed to surviving animals; Rs. 01.69 crore
- May 2005 – The Andaman and Nicobar Administration submits proposal to Government of India (GoI) for revised animal husbandry package requesting for full reimbursement of cost of animals.

### Compensation Package announced by Government of India

Sr. No.	Category	Rate per animal (Rs.)	No. of animals	Total Amount (Rs. Crore)
1	Cattle	12000	3786	4.54
2	Goats	3000	16623	4.99
3	Pigs	4000	38446	15.38
4	Poultry	80	98722	0.79
Total			157577	25.70

- August 2006 – GoI sanctions revised package of Rs. 25.70 crore (including 10.14 crore announced earlier)

### Achievements of Tsunami relief programme

- Rs 4.06 crore has been disbursed as compensation to affected tribal farmers under SGSY pattern of earlier announced package.
- Modalities to replace lost livestock to rest of the beneficiaries over the next three years are being worked out.
- 21520 Backyard poultry distributed to affected families of South Andaman and Nicobar Districts.
- 1364 MT densified feed distributed to farmers.
- 14 MT fodder seeds supplied to farmers

### Allied activities

- Distribution of backyard poultry to indigenous tribes
- Rebuilding of infrastructure
- Providing training in animal husbandry

- ✦ Encouraging revival of livelihood through animal husbandry – four poultry farms opened in Nicobar District
- ✦ Providing necessary support to NGOs working for revival of livelihood

### **Future strategies**

- ✦ Strengthening departmental composite livestock farms in various islands
- ✦ Conservation of native Teressa Goat
- ✦ Strengthening of Islands-specific animal husbandry training programmes
- ✦ Establishment of poultry farms in Car Nicobar, Kamorta, Teressa and Katchal islands
- ✦ Extension services for farmers at various islands
- ✦ Training on Post-harvest technology

### **Livelihood opportunities**

- ✦ Poultry farming – Backyard - alternate
- ✦ Goat farming
- ✦ Piggery
- ✦ Dairy farming and fodder cultivation
- ✦ Post-harvest technology
- ✦ Marketing

### **Bottlenecks**

- ✦ Permanent rehabilitation of affected families yet to be completed
- ✦ Loss of fodder resources/grazing land
- ✦ Restoration of agricultural activities

# Nicobari Fowl: A unique Germplasm of Andaman and Nicobar Islands

Dr. A. Kundu and Dr. T. Sujatha

CARI

## The Nicobari fowl

The Nicobari fowl is locally called 'takniet hyum' which means short-legged chicken. It is an endangered poultry germplasm of the Andaman and Nicobar Islands. There are three known varieties – black, brown, and white. The shank length may be short, medium, or long. This bird is particularly resistant to diseases, especially Mareks and Ranikhet. It is supposed to be the highest egg producer among all indigenous birds of India.



## Distribution of Nicobari Fowl

Name of Island	No. of villages surveyed	No. of fowls
North Andaman	5	40
Middle Andaman	21	334
South Andaman	14	649
Little Andaman	6	52
Car Nicobar	7	129
Teressa	7	273
Katchal	13	386
Nancowrie	9	394
Campbell Bay	7	52
Kondul	1	152

## Loss of poultry (including duck) in Tsunami

Before Tsunami	Loss in Tsunami
9,30,878	98,722



### Overall performance of Nicobari Fowl and Whitel Leghom (ILI-80)

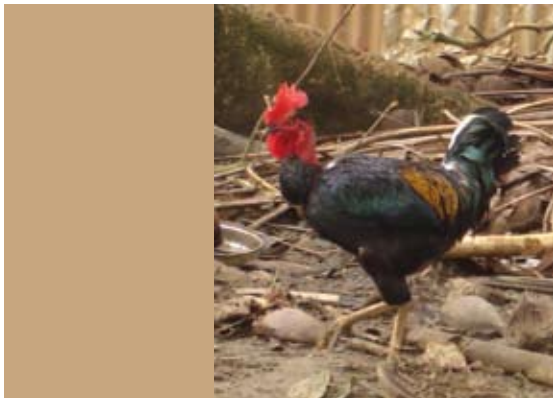
Traits	Brown Nico	Black Nico	White Nico	ILI-80
WASM (g)	1315.6±83.03	1345.3±50.11	1164±43.77	1157.94±42.07
ASM (days)	171	166	160	148
Annual Egg produ. (nos)	148±3.2	157±6.8	162±6.3	230±8
Avg.egg wt (g)	42	45	43	50
Laying period mort. %	6.4	4.9	5.1	12.5

### Meat Cholesterol content of various birds

Poultry Species	Cholesterol content (mg/100g meat)
Black nicobari	23±3.25
Brown nicobari	40.04±0.91
White nicobari	45.25±0.92
Naked Neck	35.43±0.89
Duck	74.76±1.54
Japanese Quails	60.46±0.23

### Comparitive egg laying performance of different breeds

Name of poultry breed	Location	Annual egg production
Aseel	AP	91
Kodaknath	MP	75
Barred desi	TN, AP, AandN	91
Frizzle	Hot and humid	89
Naked neck	Hot and humid	98
Brown Nicobari	AandN	148



**Status of Poultry (*Gallus domesticus*) on the Islands**

Common name	Habitat	Status	Current population	Common characteristics		
				Egg production/ annum	Egg weigh (g)	Weight at maturity (g)
Brown Nicobari	Nicobar group of islands as well as some parts of Andaman	Endangered	Total 7000. approx between three colours	140-150	40-45	1100-1300
Black Nicobari	- do -	Endangered	- do -	150-160	40-45	1400
White Nicobari	- do -	Endangered	- do -	162-170	40-45	1300
Naked neck	Found in most of the Islands	Not endangered	Not available	75-90	40-50	Male: 2000-3000 Female: 1400-1600
Frizzle fowl	Found in South, North and Middle Andaman and also some areas of the Nicobar group	Endangered	Not available	70-80	40-50	Male: 2000-2500 Female: 1250-1400

All traits adapted to hot and humid climate. No vaccination done.

# Livestock and Poultry Germplasm of Andaman and Nicobar Islands with Special Reference to the Nicobari Pig

Dr. S. Jeyakumar and Dr. A. Kundu

CARI



India is one of the 12 mega biodiversity centres in the world. The country is divided into 10 biogeographical regions.

Agriculture and animal husbandry is about 140 years old in the Islands and was brought by settlers. The Andaman Islands have been designated for poultry and dairy farming and the Nicobar Islands for rearing of pig and goat.

The phenotypic characteristics of the Nicobari pig are: short in stature, black coat and eyelids, and short and straight ears.

The pig is managed under open grazing, free range systems. It normally feeds on coconut, pandanus fruits, tuber crops roots, poor quality fish waste, crab, and kitchen and vegetable waste.

The age at first farrowing is 10 to 12 months, the litter size is normally 6 to 10, the farrowing interval is 8-10 months and the method of mating, natural.

Agriculture and animal husbandry is about 140 years old in the Islands and was brought by settlers. The Andaman Islands have been designated for poultry and dairy farming and the Nicobar Islands for rearing of pig and goat.

Dressing per cent of the carcass is 70-80%. Both growers and adults are slaughtered. Canahaun is a famous festival of the Nicobarese when pigs are definitely slaughtered.

## Islandwise details of pigs lost and family affected due to Tsunami

Islands	Pigs Lost	Families Affected
Car Nicobar	16616	2408
Chowra	4245	328
Teressa	8767	382
Katchal	3860	317
Nancowrie	325	137
Kamorta	1600	156
Trinket	700	83
Little Nicobar	300	82
Campbell bay	749	761
Kondul	36	34
Pilomillow	239	25
Bambooka	403	22

### Status of Pigs on the Islands

Common name	Scientific name	Habitat	Status	Population	Adaptation	Management	Disease resistance
Nicobari Pig	<i>Sus domesticus</i>	Nicobar group of islands	Not endangered	35000 (approx) Pre -Tsunami	Adapted to hot and humid climate of Nicobar islands	Backyard production system	Resistant to most of the common pig diseases
Andaman wild pig	<i>Sus scrofa andamanensis</i>	Andaman group of Islands	Endangered	Not available	Adapted to hot and humid climate of Andaman group of islands	Completely scavenging (Feral)	Resistant to most of the common diseases

### Status of Goats on the Islands

Common name	Scientific name	Habitat	Status	Population	Prolificacy	Adaptability	Management	Disease resistance
Barren goat	<i>Capra hircus</i>	Barren Island (Volcanic Island)	Endangered. Post-Tsunami status not known	Approx. 100	Twins and triplets are common	Adapted to the dreadful and hostile environment of Barren Island. Salt water tolerant	Free range	Acquired resistance to common diseases
Teresa goat	<i>Capra hircus</i>	Teresa, Katchal and Bambooka Islands	Endangered. Post-Tsunami status not known	(Pre Tsunami) 2000-3000	Twins and triplets are common	Adapted to hot and humid climate	Free range	Resistant to common diseases
Andaman goat	<i>Capra hircus</i>	Andaman group of islands	Not endangered	–	Twins are common	Adapted to hot and humid climate	Semi-intensive	Resistant to common diseases
Malabari goat	<i>Capra hircus</i>	Andaman group of islands	Not endangered	–	–	Adapted to hot and humid climate	Semi-intensive	Resistant to common diseases

## Status of Cattle on the Islands

Common name	Scientific name	Habitat	Status	Current population	Milk production (lit. per day)	Age at first calving (years)	Adaptation resistance	Disease	Management
Jangli gai	<i>Bos indicus</i>	Andaman groups of islands and Campbell Bay	Not endangered	About 54,000	1-3	4.5-5.5	Adapted to humid climate of Andaman and Nicobar Islands	Resistant to common diseases. No vaccination done	Backyard
Trinket Cattle	<i>Bos taurus</i>	Nancowry Islands only (Trinket Island)	Endangered and post Tsunami status not known	Survey indicates that the population is about 1000-1400	1-3	Not available	Adapted to tropical climate of Trinket Island	Resistant to common diseases. No vaccination done	Free range, Feral
Jersey cross or HF cross	<i>Bos indicus</i>	Andaman Islands	Not endangered	6412	4-6	2-3	Adapted to humid climate of Andaman and Nicobar Islands	–	Semi-intensive

# Status of Livestock and Poultry Diseases in Andaman and Nicobar Islands

**Dr. Jaisundar**

CARI

The livestock sector plays an important role by contributing about 25% of the total agricultural sector to the National economy.

A major part of the economy comes from milk and milk products. Presently India leads in milk production and this position could not have been achieved without proper health care. Livestock health is wealth, as animal health influences production and trade to a great extent. Livestock rearing was introduced by the British to support the growing demand for milk and meat. In the process they inadvertently introduced many diseases too. Today the Andaman and Nicobar Islands are free from most of the infectious and contagious diseases of livestock, but parasitic diseases are of prime concern. Hump Sore is the most common disease. Gastrointestinal parasites are also common.

Presently India leads in milk production and this position could not have been achieved without proper health care. Livestock health is wealth, as animal health influences production and trade to a great extent.

## Reports of diseases prevalent in livestock

**Viral** – Foot and Mouth Disease outbreak – twice; Swine Fever – thrice; Rinderpest – presently eradicated; Infectious Bovine Rhinotracheitis

**Bacterial** – Pneumonia in Goats; Mastitis; Brucellosis; Leptospirosis; Calf Pneumonia

**Parasitic** – Hump Sore; Fascioliasis; Amphistomiasis; Schistosomiasis; Babesiosis

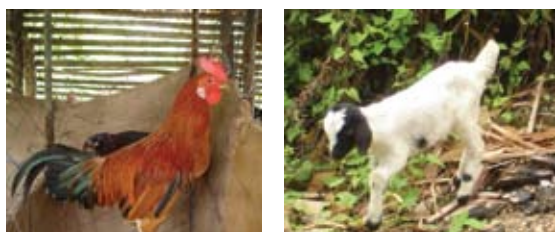
**Fungal** – Fungal Infection

Health facilities presently available on the Islands are disease diagnosis, disease forecasting, antibiotic sensitivity testing, isolation and identification of microbes, microbial load, inactivated IBD vaccine for poultry, Hump Sore ointment, blood mineral profile and teaching/training facilities.



# Livestock Farming as an Alternative Economically Viable Enterprise for Farmers of Andaman

Dr. B. Ganesh Kumar  
CARI



Livestock sector plays a crucial role in rural economy and livelihood. The overall growth rate in this sector is steady and is around 6%.

Ownership of the livestock is evenly distributed with landless laborers and marginal farmers. The progress in this sector will result in more balanced development of the rural economy. Currently consumption of animal food is less than the ICMR norms. Improvement in this sector will provide nutritional security, income and employment. India has the largest livestock population in the world in 1997.

## Dairying

The livestock population in Andaman and Nicobar Islands is, 60,000 cattle and 14,000 buffalo. The productivity is very low due to poor germplasm, shortage of feed and fodder, non-

scientific rearing practice and lack of institutional support.

## Constraints in dairy farming

S.No.	Constraints	Rank	Frequency
1.	Shortage of fodder during non-rainy seasons	1	1
2.	Shortage of fodder during rainy season	2	2
3.	Lack of nearby veterinary dispensary	3	6
4.	Lack of money	4	–
5.	Poor marketing facility	5	10
6.	Difficulty in getting good animal breed	6	11
7.	Insufficient land/space for dairy farming	7	3
8.	Non-availability of concentrates	8	4
9.	Lack of government support in marketing milk	9	10
10.	Non-availability of proper medicines in time	10	9
11.	Lack of knowledge of bank loans	11	–
12.	Lack of sufficient labour	12	7
13.	Inadequate pricing for milk in societies	13	8
14.	Disease problem	14	–
15.	Lack of proper scientific knowledge	15	–

## **Drawbacks in commercial poultry marketing in the Andamans**

- Presence of monopoly in broiler/layer marketing
- Controlled price; no free price decided by the market force
- Absence of easy and quick transportation from farm to main market
- Absence of storage facilities for meat and egg
- Absence of awareness and education among poultry farmers

## **Recommendations**

Most livestock services like AI, vaccination etc. are time sensitive, which necessitates the need for providing efficient and effective decentralized services as per the demands emanating from users. Livestock extension is based on providing services and goods and needs to be treated differently from crop related extension activities. Panchayats, co-operatives and NGOs should play a leading role in generating a dedicated band of service providers at the farmers door step in their respective areas.

To alleviate poverty and increase the family income in dry and hilly regions, the focus of investment and development strategy should be more on livestock production as it provides more than 70% of the family income... Culling and utilization of surplus animals is an established norm for animal production and improvement.

Panchayats, co-operatives and NGOs should play a leading role in generating a dedicated band of service providers at the farmers door step in their respective areas.

Establishment of registered slaughter houses and Rural Based Abattoirs (RBAs) would provide clean meat and protect the environment besides reducing the transportation cost. Livestock census should be based on cent percent coverage of households in the country on a specific date to reduce the quantitative as well as qualitative problems of census. Diversification of crop based rural economy into an animal husbandry mixed farming system must be encouraged for rapid economic development.

The future of livestock sector rests not only on the farmers, but also on the scientist, technologist and professional.



# Strategy and Action Plan for Livestock Development

It was quite clear from the presentations that there were many constraints to livestock rearing on the Islands especially after the Tsunami. The processes of developing livestock-based programmes would have to be different from those of the mainland.

## Contexts and environment-specific livestock programmes

The special and unique ecological and socio-cultural considerations require the drawing up

of a map of livestock breeds suited for different regions and communities on the Islands. For example, in areas where agriculture is not possible, such as areas where saline waters have ingressed, it may not be advisable to promote large or dairy animals as there would be scarcity of fodder. Similarly, promoting dairy programmes in water-scarce areas would be disastrous. Finally, promoting a goat-based project near a national park may pose inherent dangers to the biodiversity of the area.



The special and unique ecological and socio-cultural considerations require the drawing up of a map of livestock breeds suited for different regions and communities on the Islands.

A set of guidelines on minimum requirements for different species of livestock will be drawn up and made available.

Another matter of concern is the large numbers of feral and abandoned animals found especially in Campbell Bay and Little Andamans after the Tsunami. Methods for their control or rehabilitation need to be explored.

Procurement of animals for distribution among families is yet another problem as there are not enough animals of quality to purchase. However, as there is acute fodder shortage livestock distribution needs to be carried out in a phased manner after fodder requirements are taken care of. It is recommended that animals may be repurchased, through a properly worked out buy-back system, from those who have received animals under different programmes, and whose animals have started producing and reproducing.

Insurance details of livestock distributed are also to be worked out. One concern expressed was that if the insurance claims are in the name of the beneficiary, there could be chances of malpractices.

### **Livestock breeds**

The two established breeds of the Islands are the Nicobari pig and poultry, reared by the Nicobari community.

The genetic stock of these breeds needs to be preserved for biodiversity as well as social and cultural reasons.

Some of the immediate steps needed in that direction are:

### ***Creation of awareness on local breeds***

#### **Methods**

- Distribution of posters and leaflets amongst farmers, consumers, administrative officials, and others
- Build up a brand value for the breed, if necessary



**Bamboo Pig Feeder**



**Pig Shelter**



### Conservation of Nicobari fowl and Nicobari pig

- ✦ Creation of nucleus of elite flocks in farms
  - Survey of natural population; this could be done by students or the local community. Training for survey would be done by CARI.
  - Establish shelters and farms for producing eggs and young ones for distribution.
  - Documentation of the breed and its performance in various conditions on and off the farm.
- ✦ Possible centres for establishing farms are: Car Nicobar, with the help of the Tribal Council; and Kamorta, Hut Bay, CARI research centre, Diglipur, Mayabunder, and Port Blair, with the help of the Animal Husbandry Department.

The reason for establishing multiple centres is that in case one centre is affected by a disaster or calamity or disease outbreak, other centres could take over.

There is a sense of urgency in establishing these farms. They should be established between 2007 and 2009.

Suggested sites for in situ conservation of birds are: Campbell Bay, Kondul, and Car Nicobar. Interested farmers in other islands can establish extended nucleus revolving systems.

Caution in the case of Nicobari fowl:  
*Do not introduce wild into Megapode area.*

Caution in the case of Nicobari pig:  
*If located in the Andaman Islands, do not locate near areas where wild pigs are found.*

### Agriculture

Agriculture has suffered a serious set back in the Islands due to the Tsunami. There are also alarming reports of declining yields especially of paddy; people opting out of agriculture and looking for alternate livelihoods; and marked changes in agriculture patterns.

As livestock rearing is closely linked to agriculture, no programmes will be possible unless a detailed study on the agricultural trends is carried out. The existing status report on agriculture is also to be widely circulated.



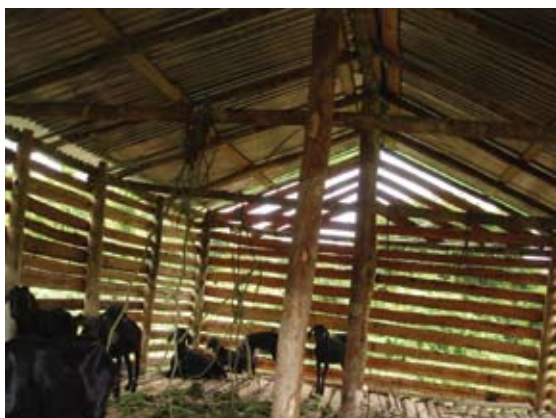
Studies also need to be undertaken on

- current trends in land use
- change in cropping patterns
- market potential for livestock products island wise
- demand and supply.

### **Fodder availability**

Fodder is a major constraint on the island, due to changes in the agricultural practice and shortage of suitable land. The following studies need to be done urgently:

- + Surveys of waste lands
- + The possibility of leasing Panchayat lands
- + Intercropping of fodder varieties in plantations of coconut and areca
- + Exploring the possibility of large farmers growing fodder for sale
- + Exploring alternate feeds and supplements such as fish meal and coconut meal. Their processing as a cottage industry will also provide income to some farmers.



### **Suggested models**

*Semi intensive goat rearing* can be considered where common lands are available. It is estimated that 30 goats can be supported on one ha of land under fodder.

These lands can be developed using hybrid Napier and indigenous tree fodder. Completely stall- fed systems or controlled/rotational grazing are to be practiced. This model may be practiced collectively or individually.

A demonstration unit could be set up in a suitable place for replication.

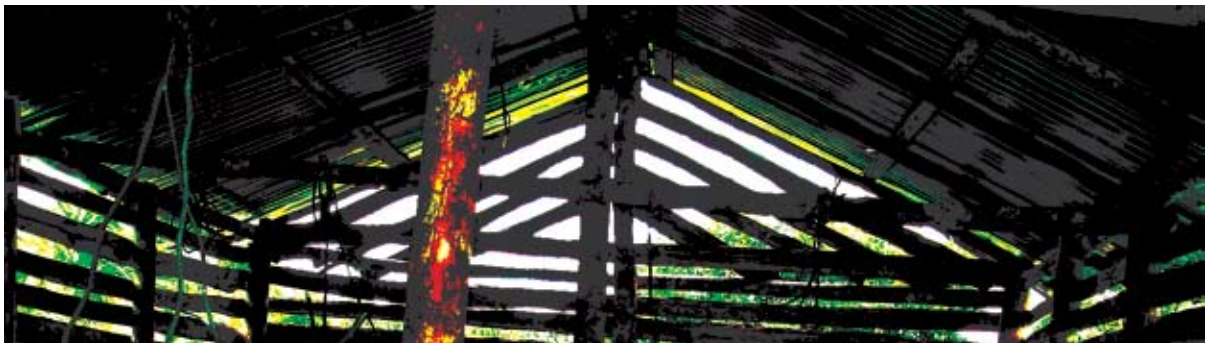
*Pond, fish, vegetable, poultry, and buffalo farming*  
These integrated models which are popular in countries of Southeast Asia are extremely suitable for island ecology systems. CARI has been working on such a model. More models need to be set up for people to observe and replicate.

*Animal shelters and housing* were widely destroyed in the Tsunami and people have found it difficult to rebuild them. Livestock rearing is also difficult while living in temporary shelters as there is no space for constructing animal sheds.

While reconstructing houses, it is recommended that the needs of livestock are also considered. It is also recommended that locally available material should be used as they are best suited to the area.

*Training programmes on improved management of livestock* are very essential and should be planned for along with regular follow-up sessions. Trainings on organic livestock rearing and biowaste management also need to be conducted.

*Others* The cheetal is an invasive species on the island and is currently competing with livestock for fodder. Cheetal is also destructive of existing biodiversity. It has been observed that only Pongamia and Lagerstromia species exist in areas where large populations of cheetal are found as all other species have been grazed. As the Wildlife Protection Act, 1972 prevents the culling of Cheetal, strong representations need to be made to the Centre to allow culling. An action plan for containing further spread of these animals needs to be simultaneously worked out.



# Annex 1

## List of Participants

Mr. Pankaj Sheksaria  
Kalpavriksha  
Apt 5, Shree Dutta Krupa  
908 Deccan Gymkhana  
Pune 411004  
Maharashtra (India)  
Phone +91 20 25654239 / 25675450  
Mobile 9423009933  
psekhsaria@gmail.com

Ms. Rachana Tiwari  
ActionAid  
106, Chaitanya , New Pahargaon  
Port Blair 744103  
A& N Islands , India  
Phone +91-3192-252514

Mr. George  
ActionAid  
106, Chaitanya , New Pahargaon  
Port Blair 744103  
A& N Islands , India  
Phone +91-3192-252514

Dr. K.A. Naveen  
Department of Animal Husbandary and  
Veterinary  
Government of Andaman and Nicobar Islands  
Port Blair  
Navininandaman2000@yahoo.com

Mr. Dharmananda Sundaray  
Tata Institute of Social Sciences  
Post Box 121, RGT Road  
Port Blair  
Andaman and Nicobar Islands (India)  
Mobile 9434284160

Dr. Aparna Singh  
Anthropology Survey of India and ANET  
Post Bag 1  
Junglighat P.O.  
Port Blair 744 103  
Andaman Islands  
Phone: 91- 03192 280081  
Mobile 9474211414  
aparna\_sl@hotmail.com

Ms. Tasneem Khan  
Barefoot Resorts  
Beach No 7, Havelock Islands  
Andaman and Nicobar Islands (India)

Dr. Rauf Ali  
FERAL  
Post Box 28  
Pondicherry 605001 (India)  
Mobile 9443747146  
rauf@feralindia.org

Mr. Francis Xavier  
Andaman and Nicobar Administration  
Port Blair  
Andaman and Nicobar Islands (India)

Dr. A. Kundu  
CARI (Central Agricultural Research Institute)  
PB No 181  
Port Blair-744 101  
Andaman and Nicobar Islands (India)  
Phone +91-3192-250234, 250340  
Mobile 9434285341  
drakundu1@yahoo.com

Dr. Jaisundar  
CARI (Central Agricultural Research Institute)  
PB No 181  
Port Blair 744101  
Andaman and Nicobar Islands (India)  
Phone +91-3192-250234, 250340  
Mobile 9434281840  
jaisunder@rediffmail.com

Dr. B. Ganesh Kumar  
CARI (Central Agricultural Research Institute)  
PB No 181  
Port Blair 744101  
Andaman and Nicobar Islands (India)  
Phone +91-3192-250234, 250340

Samir Acharaya  
Society for Andaman and Nicobar Ecology  
(SANE)  
C/o Tarang Trades & Credits  
MG Road, Port Blair 744101  
Andaman and Nicobar Islands (India)  
Phone +91-3192-233072, 232929  
sane@andamanisles.com

Dr. S. Jeyakumar  
CARI (Central Agricultural Research Institute)  
PB No 181  
Port Blair 744101  
Andaman and Nicobar Islands (India)  
Phone +91-3192-250234, 250340  
Mobile 9434282645  
drsjevakumar@rediffmail.com

Dr. T. Sujatha  
CARI (Central Agricultural Research Institute)  
PB No 181  
Port Blair 744101  
Andaman and Nicobar Islands (India)  
Phone +91-3192-250234, 250340

Mr. Neeraj Jaiminy  
ActionAid  
106, Chaitanya , New Pahargaon  
Port Blair 744103  
A& N Islands, India  
Phone +91-3192-252514

Mr. Pranav Chaudhary  
ActionAid  
106, Chaitanya, New Pahargaon  
Port Blair 744103  
A& N Islands , India  
Phone +91-3192-252514

Dr. Prachi Pophale  
Anthra  
F, Lantana Gardens  
NDA Road, Bavdhan  
Pune 411021  
Maharashtra (India)  
Phone +91-20-22953546  
anthra.pune@gmail.com

Dr. Nitya Ghotge  
Anthra  
F, Lantana Gardens  
NDA Road, Bavdhan  
Pune 411021  
Maharashtra (India)  
Phone +91-20-22953546, 22953547  
anthra.pune@gmail.com

## Annex 2

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