

Biodiversity of Indigenous Livestock Germplasm of Andaman and Nicobar Islands

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Introduction

The Andaman and Nicobar islands are blessed with a unique tropical rainforest canopy, made up of a mixed flora with elements from Indian, Myanmar, Malaysian and endemic flora and fauna strains. It is endowed with such precious diverse biodiversity, which deserve focussed research attention. The island biodiversity is challenged with anthropogenic and natural factors, climate change being the most prominent one. The archipelago "Andaman and Nicobar" consisting of 572 Islands in Bay of Bengal represents unique one of the biodiversity hotspots in India. Humid tropical climate and limited or no human interference in dense forests still maintain high level of floral and faunal diversity. The flora of Andaman group of Islands resemble with that of North-East India while Nicobar group of Islands have a wide range of plant and animal life having characteristics of the Indian, Indo-Chinese and Malayan type. Efforts are underway to document, conserve and utilize the island biodiversity through developing germplasm bank, development of varieties, depositing in national gene banks etc. However due to rapid population growth, shift in cropping pattern, excessive use of chemicals, prevalence of destructive methods of harvesting and unsustainable use of living resources are threatening the island biodiversity, which needs an urgent attention and remedial actions. This presentation reviews the biodiversity of indigenous Farm Animal Genetic Resources (FAnGR) of Andaman and Nicobar islands, their importance, habitats, performance, threats to their irreversible loss and conservation strategies.

Fauna of terrestrial, marine, coastal and mangrove ecosystem

There is the high level of endemism in the ecological profile of these islands. Overall, 9% of the fauna is endemic, 40% of the 244 species and subspecies of birds are endemic where as in mammals, 60% of the

58 species are endemic. The A & N Islands support a significant diversity of reptile and amphibians with a high level of endemism. Currently 7 amphibians and 16 reptile species are endemic to the Andaman and 2 amphibians and 15 reptiles are endemic to the Nicobar. Representing 700 genera and belonging to 140 families, about 14 percent of the angiosperm species are endemic to the islands. Among the non-endemic angiosperms, about 40% are not found in mainland India, but have only extra-Indian distribution in South East Asia. The butterfly diversity and endemism is also very high, of the 214 species and 236 subspecies in 116 genera, over 50% are endemic.

A & N Islands - An overview

- Distance : 1200 km
- Islands : 572(36 inhabited)
- Population : 3.8 lakh
- Area : 824900 ha
- Cultivable Area : 50000 ha
- Longitude : 92°-94°
- Latitude : 6°-14°
- Annual rainfall : 3000-3500 mm
- Temperature : 18-34°C
- RH : 66-85 %
- Forest Area : 86.93%

Important indigenous germplasm

Main livestock in these islands are cattle, buffalo, goat, pig, poultry, a few horses and rabbits also. Out of 37 islands, 12 islands have no livestock and another 4 islands have a population less than 200 numbers. Livestock is almost exclusively comprised of indigenous varieties (desi), i.e. non-descript which is about 80% with very few improved varieties.

Issues

- Indigenous breeds are under threat of extinction due to introduction of exotic breeds and cross breeding
- Selective breeding : our strategy

The local **cattle** of Andaman are non-descriptive (desi) type and represent an admixture of different Indian breeds that had been brought to these islands in different phases of inhabitation and rehabilitation of migrated people. The inheritance from Red Sindhi, Sahiwal and Haryana could be traced. There is a separate group of cattle in Trinket Island. Jersey and HF crossbred cows are also present in the islands

The Buffaloes of these islands do not belong to any definite or descriptive breed. However, the inheritance of Murrah, Nagpuri, Bhadawari and Marathwade could be traced.

Goats constitute 37.67% of the total livestock and goats are mostly owned by settlers and Nicobari tribes and are distributed in different island. There are five distinct population of goats are available in these islands, viz. Andaman Local Goat, Feral/semi feral goat (Barren island goat), Teresa goat, Malabari and its crosses and Boer goat crosses.

Pigs constitute 27.26 per cent of the total livestock (cattle, goat and pig) and are mostly owned by tribes and settlers and distributed in Nicobar group of islands and in different parts of Andaman Islands. There are four distinct populations of pigs available in these islands, viz. Nicobari pig, Andaman Pig (Schedule I animal protected under Wild Life (Protection) Act, 1972), Local/Desi pigs, Large White Yorkshire and its crosses. Phenotypic and molecular characterization of indigenous goat germplasm has been carried out and work is in progress for pig and cattle.

Trinket Cattle (Fig1)

- Distribution : Trinket Island
- Swedish people left these cattle .
- Now semi feral in nature.
- Live entirely on green foliage and grasses found in the forest.
- Body is well built with deep chest cavity.
- Horn short and directed upward in young and in

older it is directed outward.

- Milk production 1-3 l/day.
- Population not known.

Andaman Desi Pig (Fig2)

- Distribution : Andaman Group of Islands.
- The body color varies from rusty grey to brown and black.
- Thick and long hair on the neck and back portion, and thin and short on flank and sides.
- Litter size varies from 4-8.
- Slow growth rate.
- Adult Body Weight: 150-170 kg.

Nicobari Pig (Fig3)

- Distribution : Nicobar Group of Islands.
- Exclusively reared by Nicobari tribes for meat purpose under free-range/semi-intensive system.
- Short, black and brownish in colour.
- The ears straight.
- The hoof color greyish white.
- First farrowing age (months) 10.91 ± 0.85 .
- Litter size (no.) 8.06 ± 0.33 .
- Adult Body Weight: 175-200 kg.
- Feed : Coconut, root crops, fish waste and crab.
- Average age at slaughter: 12.76 ± 1.07 months.
- Weight at slaughter: 112.82 ± 14.26 kg.
- Dressing Percentage: 70-80%.
- Very much sustainable under low managerial condition.
- Due to introduction of LWY, breed is under threat.

Andaman wild Pig (Fig 4)

- Distribution : Jarawa reserve forest area and in Onge tribe area of Little Andaman.
- Poached by the primitive tribes and serves as main protein source.
- Comes under Schedule I animal protected under Wild Life (Protection) Act, 1972.



Fig 1 : Trinket cattle



Fig 2 : Andaman Desi Pig



Fig 3 : An adult Nicobari Pig



Fig 4 : Nicobari Wild Pig



Fig 5 : Teresa Goat



Fig 6 : Barron Island Goat

- Black in color, short-legged, small to medium sized animal.
- Very active, alert and fast runner.
- Population not known.
- Immediate need for conservation.

Teresa Goat (Fig5)

- Distribution : Teresa Island and Nicobar Island.
- Resemble Kambing kacang of Indonesia.
- Semi-feral in nature.
- Adult Body Wt: 50-70 kg (M), 50-65 kg (F).
- Prolificacy: Twin or triplet.
- Tall, brownish or tan in color with white or black patches .
- Immediate need for *in-situ* and *ex-situ* conservation.

Barren Island Goat (Fig 6)

- Distribution : Barren island where India's only active volcano is there.

- Feral in nature, survive in harsh inhabitable condition.
- Large trees are choicest fodder source (*Ficus* spp.).
- Quench their thirst by feeding fleshy leaves with relatively higher water content.
- Observed to drink sea-water.

Swot Analysis

Strength of the Islands

- Highly adapted and disease resistant indigenous livestock and poultry.
- Geographical isolation making livestock and poultry disease free from many emerging and reemerging diseases.

Limitations/Weakness

- Indigenous breeds are at the verge of extinction.
- Acute shortage of feed, concentrate and green fodder.
- Small land holding size, topography and saline

affected land are limiting cultivation of fodder.

- Lack of stated policy on animal breeding and other strategies on livestock development.
- Presence of fragmented, unorganized market for all livestock products.
- Poor perception of the farmers towards livestock production.
- High rainfall causes high incidence of parasitic disease mostly in ruminants.
- Inadequate surveillance and monitoring of infectious and contagious diseases.
- Infertility and disease problems in dairy animals.
- Mineral imbalance in soil, fodder and animals causing low productivity.

Opportunity

- Molecular approach for better understanding of the disease resistance property of Nicobari fowl and identification of the gene/genes/QTL involved. This property can be explored for production of transgenic high yielding chicken with disease resistance characters.
- Development of user-friendly diagnostic kits for quick sero-surveillance and diagnosis of livestock and poultry diseases. As A & N Islands are free from most of the deadly diseases of poultry and livestock, it is a great opportunity to make these Islands free from diseases with strict quarantine, prevention and monitoring programmes.
- As availability of feed and fodder for livestock are a real problem here, technology should be devised for formulation of economic feed production using locally available feed ingredients.
- As tourism is flourishing in A & N Islands, there is increasing demand for livestock and poultry products. So the real opportunity before us is to make A & N Islands self sufficient in milk, meat and egg through productivity improvement of livestock and poultry.

Challenge/Threat

- Pure indigenous breeds are losing their purity due to random/erroneous breeding practices. So real challenge behind us to improve the productivity as

well as maintain/conservate the pure breeds.

- Conservation, improvement and utilization of native (indigenous) breeds and genetic improvement of the established indigenous breed through selective breeding.
- Better understanding of the disease resistance property of the Nicobari fowl and its exploitation in development of disease resistant transgenic poultry.
- Up-gradation of non-descript livestock germplasm by cross breeding either by superior exotic or native germplasm without exceeding 50% exotic inheritance.
- Evaluation and efficient utilization of newer feed ingredients in livestock and poultry rations.
- Studies on nutritional management with reference to the macro and micro nutrient requirement to augment production of livestock and poultry.
- Fodder production for sustainability of livestock farming.
- Strengthening of surveillance and monitoring of prevalent and emerging diseases of livestock and poultry.
- Prevention of introduction of emerging/exotic livestock diseases to A & N islands through proper quarantine.
- Exploration of indigenous medicinal plants and ethno veterinary practices for economic health coverage and conservation of available biodiversity in the medicinal plants.
- Infertility management.
- Development of value-added products utilizing milk, eggs, meat, and culled birds for human consumption.
- Both rural and commercial sectors need to be supported through research to meet the ever-growing domestic demand of livestock products.

Issues

- Free from some deadly diseases of livestock and poultry.
- Strategic location: natural quarantine.
- Strict quarantine is required during import of

livestock to avoid new disease introduction.

- FMD from mainland: 2005 outbreak.
- As availability of feed and fodder for livestock are a real problem here, technology should be devised for formulation of economic feed production using locally available feed ingredients.
- As tourism is flourishing in A & N Islands, there is increasing demand for livestock and poultry products. So the real opportunity before us is to make A & N Islands self sufficient in milk, meat and egg through productivity improvement of livestock and poultry.

Thrust areas

- Conservation of indigenous pig (Nicobari pig and Desi pig), goat (Teresa goat and Andaman local goat) and poultry (Nicobari fowl) and their improvement.
- Cattle and Buffalo improvement programme and promotion of scientific dairy farming.

- Goat and pig improvement and promotion of scientific meat production system
- Sustainable livelihood support through improvement in rural poultry production system

Conclusion

The Andaman and Nicobar Islands are endowed with such precious diverse biodiversity deserve focussed research attention. The island biodiversity is challenged with anthropogenic and natural factors, along with the climate change which is the most prominent one. Our objective may be to develop database and repository of flora and fauna based on agriculturally important ones in Andaman and Nicobar Islands and to develop approach of maximizing productivity of farming resources through native agro-biodiversity under islands ecosystem. But the most important one is to conserve the endangered indigenous livestock and poultry as well as crop relatives, and fishery resources of the islands. With all this, let us make the island beautiful and disease free as it is.