CUSTODIAN FARMERS AND COMMUNITIES OF BIODIVERSITY CONSERVATION AND UTILIZATION IN ANDAMAN & NICOBAR ISLANDS, INDIA






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Foreword

The Andaman and Nicobar Islands comprise of 572 islands which are unique because of the tropical humid climate with more than 3000mm annual rainfall. Among one of the 12 bio-geographical zones of India, the Andaman and Nicobar Islands have a bio diversity profile of over 5500 animal species, 2500 indigenous and non- indigenous angiospermic species with three important natural eco-systems viz. the forest eco-system, the marine eco-system and mangrove eco-system. Andaman & Nicobar Islands are blessed with a unique tropical ecosystem, made of a mixed flora and fauna elements from Indian, Myanmarese and Malaysian endemic flora and fauna. It represents one of the biodiversity hotspots in India and limited human interference in dense forests maintains high level of species identity as well as diversity. Biodiversity is playing crucial role in meeting the challenges for various issues related to bio-prospecting, nutritious food, better health and decent livelihood in islands. Recognizing the significance of biodiversity, the Central Island Agricultural Research Institute, Port Blair, has taken 'Island Biodiversity' as one of the research mandates.

Efforts were made to document, conserve and utilize the agricultural bio-diversity of islands through developing germplasm blocks, development of varieties and depositing in national gene banks, etc. However, due to rapid population growth, rapid pace of construction activities, shift in crop pattern, excessive use of chemicals, prevalence of destructive methods of harvesting , unsustainable use of bio resources and seed replacement with high yielding varieties are threatening the island biodiversity and in due course of time the traditional varieties and landraces may be lost.

The emerging issues and concerns for biodiversity search and conservation need an urgent attention and remedial measures. In this context, the CIARI is organizing Custodian Farmers Meet on 19th March, 2014 and is bringing out the document on "Custodian farmers and Communities of Biodiversity Conservation and Utilization in Andaman & Nicobar Islands. The bulletin endeavors to document important commodities of agricultural biodiversity existing in the islands.

I congratulate all the facilitators who have documented the traditional plant varieties and animal breeds of custodian farmers of A &N Islands. I hope that this manuscript will give new insights and ideas to the policy makers, planners and researchers who are directly and indirectly involved in management of genetic resources especially in the islands.

Dated the 13th March 2014 **(N.K. Krishna Kumar)**

New Delhi

Preface

The Andaman & Nicobar Islands are considered to be the third biodiversity hot spot of our country which possess the unique floral and faunal diversity which includes 2500 angiosperms, 200 endemic Species, 300 species of medicinal plants, 130 species of orchids, 120 species of ferns, more than 150 species of fruits and vegetables, 10 species of oil yielding plants, 20 species of pulses and cereals. The marine ecosystems have rich diversity in mangroves, fihes, coral and sponges. Besides, there is a reservoir of micro flora including fungi, bacteria and algae which are native of these islands and could have immense value.

Among faunal diversity, the islands are immense treasure of fishes, butterflies, birds, reptiles, and insects etc. The islands have around 1200, 300 and 120 species of fishes, corals and sponges respectively. The unique Teresa goats, Nicobari pigs, Hawa Bill birds, Nicobari poultry etc are indigenous to islands. These species are preserved by the indigenous tribes and island farmers which needs great attention in terms of conservation, maintenance and promotion of unique germplasm. Besides, settlement of various socio-ethnic groups over several decades from diverse origins also enriched the bio-diversity reservoir in the islands.

Due to urbanisation and settlements in recent years, frequent occurrence of natural calamities and threats from the climate change are posing the serious threat to island biodiversity. Further, heavy inflow of tourist and increasing commercial agriculture also aggravated the situation. Therefore, suitable conservation efforts viz. ex-situ, in-situ conservation, habitat enrichment, gene banks in islands and national level are of urgent importance especially in the emerging IPR scenario.

Documentation of custodian farmers and their role in conserving the traditional varieties of cultivated plants and their wild relatives and breeds of animals in A &N Islands is very important considering above mentioned facts. An attempt has been made to compile and publish a document on "Custodian farmers and Communities of Biodiversity Conservation and Utilization in Andaman & Nicobar Islands".

We express our deep gratitude to Dr.S. Ayyappan, Secretary DARE and DG of ICAR and Dr.N.K. Krsihna Kumar, Deputy Director General (Hort) for their guidance and support for preparing this document.

We are thankful to Dr.P.N. Mathur, Regional Director, Asia Pacific & Oceania and South Asia Co-ordinator, Bioversity International, New Delhi office for guidance. We are also grateful to Dr. Bhuwon Sthapit, Regional Project Co-ordinator, NPMU-India and Dr.V.A.Parthasarathy, National Project Co-ordinator , NPMU, UNEP-GEF-TFT project, Indian Institute of Horticultural

Research, Bangaluru, for their guidance and help. We are especially thankful to the Custodian farmers mentioned in the document for their efforts in bio-diversity conservation, cooperation and sharing information on useful germplasm.

We hope that this document will be useful to the policy makers, planners, researchers and next generation farmers.

-Authors

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Introduction

The mother Earth has more than 100,000 islands which are exceptionally rich reservoirs of biodiversity and possess the environmentally fragile and economically vulnerable ecosystems. The importance of these ecosystems becomes even greater when we remember that over 600 million island inhabitants depend on these ecosystem services for food, water, shelter, medicines and other natural resources needed to sustain their daily lives. Island ecosystems are visibly unbalanced and species are threatened with extinction, with clear negative effects on human beings. Main causes of island species extinction are habitat destruction, invasive alien species, tourism development, climate change, natural disasters, overexploitation and pollution of natural resources. The Islands cover about 3% of the world's surface yet harbour a disproportionately greater amount of biodiversity in general and endemic species in particular. One third of the world's biodiversity hotspots are in islands. Out of 724 recorded animal extinctions in the last 400 years about half were island species. At least 90% of bird species that have become extinct in that period were island dwellers and 12 of the 18 centres of marine endemism are around islands. Seven of the 10 coral reef hotspots surround islands. Over 90% of Hawaiian species are endemic. About 50% of all plants, mammals, birds, reptiles and amphibians in Mauritius are endemic. The Seychelles has the highest number of endemic amphibians in the world. Cuba has 18 endemic mammals, while nearby mainland Guatemala and Honduras only have three each. Madagascar has over 8000 endemic species, the highest number of endemic species in sub-Saharan Africa – and has vowed to protect 30% of its territory by 2020.

The Andaman and Nicobar Islands comprise of 572 islands which are unique because of the tropical humid climate with more than 3000 mm annual rainfall. The Andaman-Nicobar group of islands is considered to be a veritable storehouse of plant Biodiversity. Situated between two major biodiversity hotspot, namely the Indian subcontinent and the Malaysian-Indonesian region, it is hardly surprising that the Islands manifest biodiversity of

extraordinary range within a limited geographical area. Geographically, the islands are part of the long Island Arch extending from the ArakanYoma hill range of Myanmar to the Sumatran range of Indonesia. The unique positioning of these islands between the two major biodiversity areas endows it with an unmatched distribution of plants with representatives of the Indian, Myanmarese, Thai, Malaysian and Indonesian floras. The flora of the Andaman group of islands shows closer affinity to the Indo-Myanmarese-Thai flora, while the Nicobar groups of islands are closer to the flora of Malaysia-Indonesia. Nearly 2100 species of Angiosperms have been reported from the islands, of which 11% are strictly endemic to the islands. In view of the rich biodiversity of the islands, several Indian crop-based research institutes have surveyed the islands and collected valuable germplasm. So far, about 215 species of butterflies, 68 species of birds, 1434 species of fishes, 300 species of corals, 120 species of sponges and 34 species of mangroves have been documented from A&N islands. This Island ecosystem presents a myriad of diversity conserved such as Wild mangoes, Nicobari fowl, Nicobari pig, Teresa goat, Nicobarialoo, Andaman coconuts, Andaman grapes & Karen rice etc. Efforts have been made to document the agricultural biodiversity encompassing traditional varieties, land races and wild relatives of plants and breeds of animals which are native to Andaman and Nicobar Islands. This document contains the list of Custodian Farmers and their contribution in conserving the economically important plant and animal genetic resources of A& N islands.

About Central Island Agricultural Research Institute (CIARI)

The Central Agricultural Research Institute (CARI), an ICAR unit for A & N Islands was established on 23rd June 1978 by merging different Regional Research Stations of the ICAR Institutes viz., Central Marine Fisheries Research Institute, Indian Veterinary Research Institute, Indian Agricultural Research Institute and Central Plantation Crops Research Institute. CARI caters to the specific needs of agricultural research and development of the Union Territory of Andaman and Nicobar Islands. It was entrusted with the task of developing technologies for enhancing the productivity and production of crops, livestock and fishery through adoptive and basic research to bridge the gap between requirement and the local production. The institute is unique in ICAR system which is engaged in multidisciplinary research benefiting island ecosystem. It has several accomplishments during the last thirty five years of its service despite various unsurmountable constraints. The research activities are carried out under five divisions viz., Natural Resource Management, Horticulture & Forestry, Field Crops, Fisheries Science, Animal Science and one Social Science Section. The Institute has its main campus located at Garacharma farm and is spread over 62 ha of land wherein research work related to field crops, horticulture, animal sciences and fresh water fisheries are being carried out. In addition, it has 3 Krishi Vigyan Kendras located one each at Sippighat, Car Nicobar and Nimbudera covering all the three districts of the Island, besides an Out Reach Centre supported by NABARD at Diglipur, North Andaman.

With the accumulated experience and expertise in island agriculture, it is envisioned to make a major stride in coming years towards our cherished goal of "emerging as the Institute of Excellence on Tropical Island Agriculture in the Asian countries". Accordingly, the Institute in the XII five year plan, has been re-named as Central Island Agricultural Research Institute (CIARI) and it is high time we capitalize on our own research foundation and the cumulative strength as a member of NARS to be a model for tropical island agriculture research to the South East Asian countries in short term and entire world, in long term.

Mission

To provide decent livelihood to farm youth from agriculture in a fragile island ecosystem on sustainable basis.

Vision

The Institute envisages developing the agri-horticulture, livestock and fisheries sector in a sustainable way through technological innovation in the changing climatic scenario to ensure decent livelihood in the fragile island ecosystem.

Mandate

i. To provide a research base to improve the productivity of important agri-horticulture, livestock and fisheries of A&N Islands through adaptive and basic research for attaining economic self sufficiency.

ii. To develop appropriate plans for conservation of natural resources and their sustainable use.

iii. To standardize technologies for animal health coverage and livestock production.

iv. To standardize techniques for capture and culture fishers including coastal aquaculture.

v. First line transfer of technology and training to the relevant state departments.

HORTICULTURE & FORESTRY

1. Andaman Ordinary Tall

Name of germplasm	:	Andaman Ordinary Tall (AOT)
Scientific name	:	*Cocus nucifera*
Location of farmers	:	Kurmadera
Name of the farmer & address	:	Mr. N. K. Unnin Malabar Co-operative Coconut Farming Society, Kurmadera

1.	Since how long the germplasm is being maintained (brief history)	55 years
2.	Status, whether exists in pure original form / Mixed	Exists in pure original form
3.	Area/ Unit/ No. under conservation	60 ha. There are about 6000 number yielding palms exists in the plantation
4.	Net economic value	70 to 80 nuts/palm under rainfed condition
5.	Whether Registered in some organization ?, If yes, few details	No

6.	Brief description about germplasm	AOT is regular bearer and produces high yield under rainfed condition. It is resistant to leaf spot and free from other major diseases.
7.	Reasons for its conservation by farmer	
	Quality	High copra content
	Disease resistance	Free from major pest and diseases
	High economic value	Higher copra recovery and having higher percentage of oil
	Market demand	It has high market potential
	Post harvest qualities	--
	Any other	It is popular in Southern India
8.	Facilitators	Dr. M. Sankaran, Dr. V. Damodaran, Dr. D.R.Singh, Dr. B.A.Jerard and Dr. S. Dam Roy

2. Andaman Giant Tall

Name of germplasm	:	Andaman Giant Tall (AGT)
Scientific name	:	*Cocus nucifera*
Location of farmers	:	Kurmadera
Name of the farmer & address	:	Mr. N. K. Unnin Malabar Co-operative Coconut Farming Society, Kurmadera

1.	Since how long the germplasm is being maintained	55 years
2.	Status, whether exists in pure original form / Mixed	Exists in pure original form
3.	Area/ Unit/ No. under conservation	60 ha. Area under coconut. About 100 trees of Andaman Giant Tall is being maintained
4.	Net economic value	20-40 nuts/tree/year. Big size fruits/nuts.
5.	Whether Registered in some organization ?, If yes, few details	No

6.	Brief description about germplasm (Complete characterization details)	This variety produces big size fruits. No. of nuts are very low (20-40 nuts/year). It is drought tolerant
7.	Reasons for its conservation by farmer	
	Quality	Big size nut with higher copra content
	Disease resistance	Resistance to major pest and diseases. It is tolerant to furrowing nematode
	High economic value	
	Market demand	Good marker potential
	Post harvest qualities	_
	Any other	_
8.	Facilitators	Dr. M. Sankaran, Dr. V. Damodaran, Dr. D.R.Singh, Dr. B.A.Jerard and Dr. S. Dam Roy

3. Andaman Dwarfs

Name of germplasm	:	Andaman Dwarf Coconut
Scientific name	:	*Cocus nucifera*
Location of farmers	:	Kurmadera
Name of the farmer & address	:	Mr. N. K. Unnin Malabar Co-operative Coconut Farming Society, Kurmadera

1.	Since how long the germplasm is being maintained	55 years
2.	Status, whether exists in pure original form / Mixed	Exists in pure original form
3.	Area/ Unit/ No. under conservation	60 ha area under coconut plantation. About 3 ha area under dwarf coconuts
4.	Net economic value	120-150 nuts/ tree
5.	Whether Registered in some organization ?, If yes, few details	Not yet
6.	Brief description about germplasm	There are 3 dwarfs (Orange, yellow and green colour). High quality tender nut and extremely dwarf in nature
7.	Reasons for its conservation by farmer	

	Quality	Excellent quality tender nut
	Disease resistance	Resistance to major pest and diseases
	High economic value	High market demand for tender nut
	Market demand	Huge market potentials
	Post harvest qualities	–
	Any other	–
8.	Facilitators	Dr. M. Sankaran, Dr. V. Damodaran, Dr. D.R.Singh, Dr. B.A.Jerard and Dr. S. Dam Roy

4. Nicobari Aloo

Name of germplasm	:	Nicobari Aloo
Scientific name	:	*Dioscorea alata*
Location of farmers	:	Car Nicobar
Name of the community leader	:	Mr. Aberdeen Blair
Address	:	The Chairman Tribal Council Car Nicobar, Nicobar District

1.	Since how long the germplasm is being maintained	Nicobari Tribes conserve this germplasm traditionally for more than 200 years
2.	Status, whether exists in pure original form / Mixed	Exist in pure form
3.	Area/ Unit/ No. under conservation	Every "Tuhet" conserve this germplasm and it is also being conserved in community gardens (>50 ha)
4.	Net economic value	Good source of staple food
5.	Whether Registered in some organization ?, If yes, few details	"Achin and Paltu" CTCRI and CARI
6.	Brief description about germplasm (Complete characterization details)	"Achin"- Purple flesh and produces good size tubers. It is a female. "Paltu"- White flesh and good cooking quality

7.	Reasons for its conservation by farmer	
	Quality	Good storage life and cooking quality
	Disease resistance	Free from pest and diseases
	High economic value	Good market potential
	Market demand	
	Post harvest qualities	Throughout the year, people consume
	Any other	_
8.	Facilitators	Dr. M. Sankaran, Dr. V. Damodaran, Dr. James George, Dr. S. Dam Roy and Dr. Vivekanandh Singh

5. Khoon Phal

Name of germplasm	:	Khoon phal
Scientific name	:	*Heamatocarpus validus*
Location of farmers	:	Diglipur
Name of the farmer & address	:	Shri. Maninder Mistry, Desbandhugram, Diglipur, North Andaman

1.	Since how long the germplasm is being maintained	6 years
2.	Status, whether exists in pure original form / mixed	Pure form
3.	Area/ Unit/ No. under conservation	4 Ha.
4.	Net economic value	250-300/kg
5.	Whether Registered in some organization ?, If yes, few details	No

6.	Brief description about germplasm	It is a climber and fruits are highly rich in Iron and other phytochemicals. Fruits are ovoid in shape and dark red colour
7.	Reasons for its conservation by farmer	
	Quality	High Quality
	Disease resistance	Resistant to major pest and diseases
	High economic value	Yes
	Market demand	More demand in market
	Post-harvest qualities	Good keeping quality at room temperature
	Any other	Good source of Iron and suggested for anaemic.
8.	Facilitators	Dr.D.R. Singh, Dr.T.V.R.S. Sharma, Dr.S.K. Zamir Ahmed, Shri.L.B. Singh and Dr.S. Dam Roy

6. Blue Mango

Name of germplasm	:	Neil Mango
Scientific name	:	*Mangifera indica*
Location of farmers	:	Neil Island
Name of the farmer & address	:	Shri.Chintaharan Neil Island

1.	Since how long the germplasm is being maintained	20 years
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation	1.5 Acres
4.	Net economic value	-
5.	Whether Registered in some organization ?, If yes, few details	No
6.	Brief description about germplasm (Complete characterization details)	Purple colour mango
7.	Reasons for its conservation by farmer	
	Quality	Better taste, colour and quality. Rich in ascorbic acid and flavonoids
	Disease resistance	Not reported
	High economic value	Yes, it is economical
	Market demand	High demand in market
	Post harvest qualities	Better shelf life

		He started doing grafting from past 3 years and maintained 7-8 varieties viz., Bagnaphalli, ammarpali, rumeni, totapuri, Himsagar.
8.	Facilitators	Dr. Dipak Nayak, Dr.D.R. Singh, Dr.M. Sankaran, Dr.R. Sudha, Dr. Shrawan Singh, Dr.V. Damodaran, Dr.K. Abirami and Dr.S. Dam Roy

7. Kewadi

Name of germplasm	:	Kewadi
Scientific name	:	*Pandanus lerum*
Location of farmers	:	*Hongkahula* Kinmai, Car Nicobar
Name of the farmer & address	:	Shri AubearyJames *Hongkahula* Kinmai, Car Nicobar

1.	Since how long the germplasm is being maintained	His father and forefather is planted it.
2.	Status, whether exists in pure original form /mixed	Pure form, Endemic to Nicobar Island
3.	Area/ Unit/ No. under conservation (few lines on extent of present coverage under germplasm)	Four types of *Pandanus* is found in Car Nicobar *i.e.* red, yellow, gray-brown colour for fruit and another one for only used to making mat
4.	Net economic value	Not recorded
5.	Whether Registered in some organization ?, If yes, few details	No

6.	Brief description about germplasm (Complete characterization details)	Red colour Pandanus bearing fruiting round the year while others only May to August. Yellow and gray-brown types Pandanus is tastier then red colour. He explains that, *Pandanus* plant is used by indigenous people of the Nicobar Islands. It was a staple food before introduction of rice, wheat flour, etc.Pandanus propagated by seed, side suckers and roots.
7.	Reasons for its conservation by farmer	
		The species vary in size from small shrubs less than 1 metre (3.3 ft) tall, to medium-sized trees 20 metres (66 ft) tall, typically with a broad canopy, heavy fruit, and moderate growth rate.
	Disease resistance	Observed to be resistant to major pests and diseases
	High economic value	Not evaluated
	Market demand	Nicobari tribal are also eating fresh and boiled seed of *Pandanus*. They prepare a dish by *Pandanus* fruit pulp after boiling of cones, which is locally known as *Kumeuch* in Nicobari language. The Nicobari people take *Kumeuch* along with mixture of coconut milk, fresh fish, citrus, ginger, chilli etc. In addition, the leaves are used for thatching or roof crafting. Craftsmen collect the Pandanus leaves from plants in the wild and prepare handicraft *i.e.*mats, jewellery boxes.
	Post harvest qualities	Better keeping quality for more than 2-3 weeks
	Any other	-.
8.	Facilitators	Dr.D.R.Singh, Dr. Vivekanada Singh and Shri.L.B. Singh

8. Noni

Name of germplasm	:	Noni (Lurang)
Scientific name	:	*Morinda citrifolia*
Location of farmers	:	Hongkumurh, Mus, Car Nicobar
Name of the farmer & address	:	Shri Israel, Mus, Car Nicobar

1.	Since how long the germplasm is being maintained (brief history)	His father and forefather is planted it. He has maintained Noni trees at his community garden as wild harvest for fresh consumption
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation (few lines on extent of present coverage under germplasm)	He has developed medicinal garden near house with thirty types of medicinal plants and maintained it
4.	Net economic value:	Not revealed
5.	Whether Registered in some organization ?, If yes, few details	No

6.	Brief description about germplasm (Complete characterization details)	Medium size fruit, round and above bearer. Showed better results when intercropped with coconut and arecanut. He used Noni as folk lore medicine and consume as fresh as when he got ripe fruit during visit of community gardens and forest areas.
7.	Reasons for its conservation by farmer	
	Quality	Round and above bearer, saline resistant
	Disease resistance	Resistant to major pests and diseases
	High economic value	Not known
	Market demand	Preffered by industries for prepartion of health drinks , capsules, medicines etc.,
	Post harvest qualities	Shelf life is 3-4 days
		He is a herbal tradition practicenor and provides treatment for different types of patients i.e. fever, files, tuberculosis, hypertension, cut & wounds, etc.
8.	Facilitators	Dr.D.R. Singh, Dr. Vivekanada Singh and Shri.L.B.Singh

FIELD CROPS

9. Khushbayya Rice

Name of germplasm	:	Khushbayya
Scientific name	:	*Oryza sativa*
Location of farmers	:	Mayabunder
Name of the community leader & address	:	Rev. Saw Saytha, (Karen community) President, Karen Welfare Association Webi, Mayabunder, North Andaman Rampur Gram Panchayat, Tehsil, Mayabunder, North & Middle Andaman District

1.	Since how long the germplasm is being maintained	The rice land race *Khushbuyya* or *Natta Khushbu Dhan* is being grown and maintained since 1925 onwards by Karen community who originally came from Burma (now Myanmar) and settled in Andaman.
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation	The population of Karen community is residing in Webygram, Karmatang, Lataw, Burmadera, Basecamp, Borang and Chipo villages in Mayabunder area (Middle Andaman) of A & N Islands.
4.	Net economic value	About Rs.25 / kg
5.	Whether Registered in some organization?	No
6.	Brief description about	It is medium duration, mildly aromatic, nutritive and gives high yield among all Karen rice varieties. It is used for lunch

	germplasm	preparation. It grows about 140 cm tall and matures in about 120 days. It has long, clustered and droopy panicles and yields about 2.5 t ha^{-1} paddy.
7.	Reasons for its conservation by farmer	Traditionally, it is known that if a Karen farmer has 2 ha rice land, about 1 ha has to be planted under *Khushbuyya* variety which might be due its relatively high yield to feed and sustain the family. This tradition of growing at least 5 different varieties for different purposes also favours their genetic variability and conservation. It is aromatic, good in taste and high yielding among all Karen rice varieties.
	Quality	It has scented grains and cooked rice. The length and breadth of grains is 8.73 mm and 3.48 mm with L/B ratio of 2.51. It has high amylose content and medium gelatinization temperature.
	Disease resistance	Like other rice varieties, it shows normal reaction to diseases and pests of rice.
	Market demand	It is the most commonly used rice by Karen farmers.
	Post harvest qualities	It has aromatic grains and cooked rice. This variety is suited for preparation of rice noodles called as *Kokhawnaw* in Karen parlance.
	Any other	This land race is also called as "*Choi-chi-manai* which in Karen language means that it can grow without manure.
8.	Facilitators	Dr. R.K.Gautam, Dr. P.K. Singh, Dr. S.K.Zamir Ahmed, Dr. Naresh Kumar, Dr. A.K. Singh and Dr. S. Dam Roy

10. Black Burma Rice

Name of germplasm	:	Black Burma
Scientific name	:	*Oryza sativa*
Location of farmers	:	Mayabunder
Name of the community leader & address	:	Rev. Saw Saytha, (Karen community) President, Karen Welfare Association Webi, Mayabunder, North Andaman Rampur Gram Panchayat, Tehsil, Mayabunder, North & Middle Andaman District

1.	Since how long the germplasm is being maintained	The rice land race Black Burma is being grown and maintained since 1925 onwards by Karen community who originally came from Burma (now Myanmar) and settled in Andaman.
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation	The population of Karen community is residing in Webygram, Karmatang, Lataw, Burmadera, Basecamp, Borang and Chipo villages in Mayabunder area of A & N Islands.
4.	Net economic value	About Rs.100-125 / kg
5.	Whether Registered in some organization.	Submitted in NBPGR, New Delhi (IC 296798)
6.	Brief description about germplasm	It has dark green leaves with conspicuous purple pigmentation of coleoptiles, leaf sheath, auricles, stigma and apiculus. It grows quite tall (174 cm) and matures in 135 days. It yields

		about 2.0 t ha^{-1} paddy.
7.	Reasons for its conservation by farmer	It is sticky, nutritive and good for breakfast.Farmers fetch high market price (Rs.100-125/kg) as compared to other land races.
	Quality	The length and breadth of grains is 9.73 mm and 3.85 mm with L/B ratio of 2.52. It has high amylose content and low gelatinization temperature.
	Disease/pest resistance	Due to sticky and attractive grains, there is relatively more incidence of insect pests on this rice.
	High economic value	The rice is sold at quite high price of Rs.100-125 / kg due to specific qualities.
	Market demand	It is fondly consumed by Karen community.
	Post harvest qualities	It is sticky when cooked and '*Halwa*' is prepared from its flour which is better than '*maida*' and used for breakfast by Karens. It is also called as *Taiethu* in Karen parlance meaning black sticky rice. It is water-soaked, mixed with ripe banana, wrapped in leaves and is steam-cooked. Afterwards, the coconut and sugar/ salt are added and made in to balls called as *Burma ladoos* for festivities.Karens believe that no other rice variety except Black Burma is suitable for this preparation.
	Any other	Reported as tolerant to aluminium toxicity and moderately tolerant to salinity stresses.
8.	Facilitators	Dr. R.K.Gautam, Dr. P.K. Singh, Dr. S.K.Zamir Ahmed, Dr. Naresh Kumar, Dr. A.K. Singh and Dr. S. Dam Roy

11. White Burma Rice

Name of germplasm	:	White Burma
Scientific name	:	*Oryza sativa*
Location of farmers	:	Mayabunder
Name of the community leader & address	:	Rev. Saw Saytha, (Karen community) President, Karen Welfare Association Webi, Mayabunder, North Andaman Rampur Gram Panchayat, Tehsil, Mayabunder, North & Middle Andaman District

1.	Since how long the germplasm is being maintained	The rice land race White Burma is being grown and maintained since 1925 onwards by Karen community who originally came from Burma (now Myanmar) and settled in Andaman.
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation	The population of Karen community is residing in Webygram, Karmatang, Lataw, Burmadera, Basecamp, Borang and Chipo villages in Mayabunder(Middle Andaman) area of A & N Islands.
4.	Net economic value	About Rs.100-125 / kg

5.	Whether Registered in some organization?	No
6.	Brief description about germplasm	It has light purple stigma with purple grain tip. It grows quite tall (174 cm) and matures in 135 days. It yields about 2.3 t ha^{-1} paddy.
7.	Reasons for its conservation by farmer	It is sticky, nutritive and good for breakfast.Farmers fetch high market price (Rs.100-125 / kg) compared to other varieties.
	Quality	It has long slender grains. The length and breadth of grains is 10.75 mm and 3.95 mm with L/B ratio of 2.72. It has intermediate amylose content and low gelatinization temperature.
	Disease/pests resistance	Due to sticky and attractive grains, there is relatively more incidence of insect pests on this rice.
	High economic value	The rice is sold at quite high price of Rs.100-125 / kg due to speciality rice.
	Market demand	It is fondly consumed by Karen community.
	Post harvest qualities	It is sticky when cooked and used for *Lassa*/breakfast and gives energy for long time.It is also called as *Taiewah*meaning white sticky rice in Karen dialect. It is water-soaked, mixed with ripe banana, wrapped in leaves and is steam-cooked. Later , the coconut and sugar/ salt are added and made in to balls called as *Burma ladoos* for festivities
8.	Facilitators	Dr. R.K.Gautam, Dr. P.K. Singh, Dr. S.K.Zamir Ahmed, Dr. Naresh Kumar, Dr. A.K. Singh and Dr. S. Dam Roy

12. Mushley Rice

Name of germplasm : Mushley

Scientific name : *Oryza sativa*

Location of farmers : Mayabunder

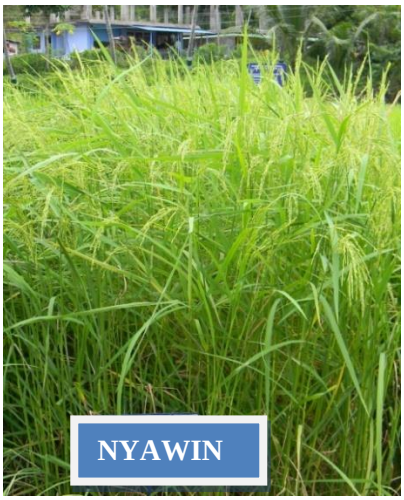
Name of the community leader & address : Rev. Saw Saytha, (Karen community)
President, Karen Welfare Association
Webi, Mayabunder, North Andaman
Rampur Gram Panchayat, Tehsil, Mayabunder,
North & Middle Andaman Districts

1.	Since how long the germplasm is being maintained	The rice land race Mushley is being grown and maintained since 1925 onwards by Karen community who originally came from Burma (now Myanmar) and settled in Andaman.
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation	The population of Karen community is residing in Webygram, Karmatang, Lataw, Burmadera, Basecamp, Borang and Chipo villages in Mayabunder area (Middle Andaman) of A & N Islands.
4.	Net economic value	About Rs.25 / kg
5.	Whether Registered in some organization?	No

6.	Brief description about germplasm	It is tall (132 cm) with long duration (175 days for maturity) and gives higher yield (about 2.5 t ha^{-1}). It possesses bold and creamy white grains.
7.	Reasons for its conservation by farmer	Traditionally, it is known that if a Karen farmer has 2 ha rice land, about 1 ha has to be planted under Khushbuyya variety and 0.5 ha under Mushleywhich might be due to their relatively higher yields to feed and sustain the family.
	Quality	The length and breadth of grains is 8.75 mm and 3.25 mm with L/B ratio of 2.69. It has low amylose content and medium gelatinization temperature. It has very soft cooked rice than Khushbayya.
	Disease resistance	Like other rice varieties, it shows normal reaction to diseases and pests of rice.
	Market demand	It is commonly used rice by Karen farmers.
	Post harvest qualities	It has soft cooked rice.
8.	Facilitators	Dr. R.K.Gautam, Dr. P.K. Singh, Dr. S.K.Zamir Ahmed, Dr. Naresh Kumar, Dr. A.K. Singh and Dr. S. Dam Roy

13. Nyawin Rice

Name of germplasm	:	Nyawin
Scientific name	:	*Oryza sativa*
Location of farmers	:	Mayabunder
Name of the community leader & address	:	Rev. Saw Saytha, (Karen community) President, Karen Welfare Association Webi, Mayabunder, North Andaman Rampur Gram Panchayat, Tehsil, Mayabunder, North & Middle Andaman District



1.	Since how long the germplasm is being maintained	The rice land race Yaeon has been grown and maintained since 1925 onwards by Karen community who originally came from Burma (now Myanmar) and settled in Andaman.
2.	Status, whether exists in pure original form / Mixed	Pure form
3.	Area/ Unit/ No. under conservation	The population of Karen community is residing in Webygram, Karmatang, Lataw, Burmadera, Basecamp, Borang and Chipo villages in Mayabunder area (Middle Andaman) of A & N Islands.
4.	Net economic value	It is not grown for selling purpose but is home use only
5.	Whether Registered in some organization?	No
6.	Brief description about germplasm	It has medium height (140 cm), light purple coloration of leaf auricles, thin stems with very long panicles. It yields low i.e.

		about 2.0 t ha^{-1} paddy.
7.	Reasons for its conservation by farmer	It is good in taste, quality and soft like basmati rice.
	Quality	It is best in terms of taste, quality and soft like basmati rice. It is used for both lunch and dinner preparation.
	Disease resistance	Like other rice varieties, it shows normal reaction to diseases and pests of rice.
	High economic value	-
	Market demand	It is mostly used for home consumption only.
	Post harvest qualities	It has high digestibility and is thus given to elderly people and patients.
8.	Facilitators	Dr. R.K.Gautam, Dr. P.K. Singh, Dr. S.K.Zamir Ahmed, Dr. Naresh Kumar, Dr. A.K. Singh and Dr. S. Dam Roy

ANIMAL SCIENCE

14. Nicobari Fowl

Name of germplasm	:	Nicobari Fowl
Scientific name	:	*Gallus gallusdomesticus*
Location of farmers	:	Car Nicobar
Name of the farmer & address	:	Shri Berack Johnson S/o. Shri. Johnson Othangtin, Kinmai, Car Nicobar

1.	Since how long the germplasm is being maintained	Nicobari fowl has been maintained since long back by ancestors of the tribal community.
2.	Status, whether exists in pure original form / Mixed	These fowl is existing in pure original form.
3.	Area/ Unit/ No. under conservation	The Nicobari tribes inhabited in Car Nicobar, Chowra, Bambooka, Teressa, Katchal, Camorta, Nancowrie, Little Andaman, Kondal and Great Nicobar are maintaining this indigenous native poultry germplasm. The present population is about 3000.
4.	Net economic value	Nicobari fowl is the highest egg producer among all indigenous (desi) birds available in India. It produces approxi. 140 – 160 eggs per annum per hen under free range system.
5.	Whether Registered in some organization ?, If yes, few details	Yes. Nicobari fowl has been registered as an indigenous native breed of A&N Islands with National Bureau of Animal Genetic Resources.Accession number INDIA_CHICKEN_3300_NICOBARI_12013.

6.	Brief description about germplasm	It is a brownish matty coloured hardy bird. They are short legged and medium sized and compact body conformity. These fowls are mostly single combed with pinkish wattles and ear lobe. They have short and thick neck, black plumage tipped with brown shade, breast bulging in front, medium sized tail and long saddle feathers fitting well with tail.
7.	Reasons for its conservation by farmer	Mentioned below:
	Quality	Low mortality and high survivability in harsh climates (hot and Humid) prevailing in Nicobar group of Islands.
	Disease resistance	Nicobari fowls are relatively resistant to common poultry diseases viz., Ranikhet, Infectious Bursal Disease, *Salmonella*, *E.coli* and *Coccidiosis*.
	High economic value	High prolific egg layers among all desi birds under free range condition with supplementary feeding. Hence, a small flock of birds could meet the requirement for egg consumption of a medium sized family.
	Market demand	Huge market demand for this desi egg due to presence of desired shell and egg yolk color ad taste for consumers preference
	Post harvest qualities	The percent yield of breast meat (25%) and lean meat (35%) is higher than the other indigenous birds.
	Any other	Short shank length is famous for its beauty. Large and medium are also available. Three varieties vizBrown,Black and white are available .
8.	Facilitators	Dr.A. Kundu, Dr.T. Sujatha, M.S. Kundu , Dr. Jai Sunder, Dr. Zachariah George, Dr. Nagesh Ram, Dr. Abhya Kumar Singh and Dr.N.C.Choudhari

15. Nicobari Pig

Name of germplasm	:	Nicobari Pig
Scientific name	:	*Sus scorofanicobaricus*
Location of farmers	:	Car Nicobar
Name of the farmer & address	:	Shri Benjamin John S/o. Shri. John Taira, Mus, Car Nicobar

1.	Since how long the germplasm is being maintained	Since time immemorial
2.	Status, whether exists in pure original form / mixed	Nicobari tribal farmers of Car Nicobar and Nancowrie group of islands are maintaining the pure indigenous stock of Nicobari pigs.
3.	Area/ Unit/ No. under conservation (few lines on extent of present coverage under germplasm)	The Nicobari tribes inhabited in Car Nicobar, TeressaCamorta, Katchal, Nancowrie, Little Andaman and Great Nicobar are maintaining this indigenous native pig germplasm. The present population is about 35,000.
4.	Net economic value	Reared with supplemental feeding and under Zero management condition. Nicobari pigs produce more litter size. It is regarded as family asset and invaluable to the tribes.

5.	Whether Registered in some organization ?, If yes, few details	Yes. Applied to National Bureau of Animal Genetic Resources for registration of Nicobari pig as an indigenous native breed of A&N Islands vide dated 18.12.2013
6.	Brief description about germplasm	Nicobari pigs are indigenous pigs of Nicobar Islands and are reared by Nicoabri tribes since time immemorial. They are sturdy and short with long body and red-brown, black, grey, brown, blakish brown and fawn skin colour. Marked bristle crest (mane) on the back of the pig extend from mid head/shoulder to base of the tail. Facial profile varied from flat to concave. Slightly downward arch/ curvature of the low back. Short neck with very large jowl. characteristic feature of the tail is having no curling. They are fast runner. Evolved and thriving under plantation based low input production system of the Nicobari tribes.
7.	Reasons for its conservation by farmer	
	Quality	Nicobari pig rearing is considered as a symbol of pride and asset in a family and pigs are linked with all socio-cultural activities/ceremonies of Nicobari tribes. These pigs have good mothering ability so that early piglet mortality is less. These are adaptable to harsh climatic condition of A&N Islands.
	Disease resistance	Nicobari pigs are relatively resistant to common pig diseases.
	High economic value	This indigenous breed produces comparatively high dressing yield at market age. Meat of this pig is highly preferred by all tribal farming community.
	Market demand	In general there is huge market demand for the pig meat of this indigenous breed.
	Post harvest qualities	Dressing per cent (70-80%) is higher than the other local desi pigs.
	Any other	It runs very fast, it is semiferal in nature.
8.	Facilitators	Dr. M.S.Kundu, Dr.A. Kundu, Dr. Jai Sunder Dr. Zachariah George, Dr. Nagesh Ram, Dr. Abhay Kumar Singh and Dr.N.C.Choudhari

16. Teressa Goat

Name of germplasm : Teressa goat

Scientific name : *Caprine*

Location of farmers : Car Nicobar

Name of the farmer & address : Shri Rufus Mark

S/o. Shri. Mark, Chuomiyam, Car Nicobar

1.	Since how long the germplasm is being maintained	This goat breed is present in the Nicobar group of islands since time immemorial and it was known in the 1990s
2.	Status, whether exists in pure original form / Mixed	Nicobari tribal farmers of Teressa Island, Car Nicobar and Nancowrie group of islands are maintaining the pure indigenous stock of Teressa goats
3.	Area/ Unit/ No. under conservation	The Nicobari tribes inhabited in Car Nicobar, TeressaCamorta, Katchal, Nancowrie, Little Andaman and Great Nicobar are maintaining this indigenous native goat germplasm. The present population is about 8000.
4.	Net economic value	High body weight at market age.
5.	Whether Registered in some organization ?, If yes, few details	Yes. Applied to National Bureau of Animal Genetic Resources for registration of Teressagoat as an indigenous native breed of A&N Islands vide dated 18.12.2013.
6.	Brief description about germplasm	Tall, sturdy, brownish or dark tan or black or white in colour with white and black patches. Black hairs on dorsal midline up to the tail. Black colored muzzle, eyelids and hoofs. Peculiar white patch/line starting

		from inner canthus of both eyes or from eye brows and extending up to nostrils or mouth. Height ranges from 24 to 27 inches. Head length of male and female is 8.86±0.10 and 7.5±0.27 inches. Tail is medium to long. Large horn with flat base. Erected ears directing downwards. Teressa goat is considered as an indigenous goat breed / germplasm belonging to this island territory.
7.	Reasons for its conservation by farmer	
	Quality	Superior germplasm with high body weight under all harsh environment of Nicobar group of Islands.
	Disease resistance	Teressa goats are relatively resistant to common goat diseases.
	High economic value	This meat purpose breed produces comparatively high body weight at market age under free range condition with kidding rate of 2 in a year.
	Market demand	In general there is huge market demand for the goat meat of this indigenous breed.
	Post harvest qualities	The percent yield of lean meat (35%) is higher than the other local indigenous(desi)goats.
	Any other	Meat is very tasty.
8.	Facilitators	Dr.A. Kundu, Dr. JaiSunder, Dr. M.S. Kundu, Dr.T. Sujatha, Dr. Zachariah George, Dr. Nagesh Ram, Dr. Abhay Kumar Singh and Dr.N.C. Choudhuri