ICAR-CIARI
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From Director's Desk ...

I am happy to present the salient achievements and activities conducted during the first quarter of the year 2023.

Exploration in Nancowrie group of Islands revealed the presence of wide diversity among the Etlingera plants (torch ginger). Evaluation of palak varieties under island conditions showed that variety All green performed better in terms of early and vigorous growth, multicut and yield of leaves under ridges and furrow system with alternate day irrigation. Varietal evaluation of sweet Potato, tapioca and Colocasia with released varieties and local collections revealed the better performance of Sree Vijaya followed by Sree Jaya in case of Tapioca in terms of higher tuber yield and cooking quality.

Nucleus seed garden of improved varieties of coconut and arecanut was established in the Garacharma farm to facilitate planting material production. Sensory evaluation of woody pepper and garcinia syrup was carried out with overall acceptability.

The first baseline information on the prevalence of marine debris in Car Nicobar revealed that the beaches were heavily loaded with plastic debris particularly of foreign origin. First report of *Ichthyophthirius* sp. a protozoan parasite was recorded in native and endemic freshwater fishes of the Andaman Islands.

Studies on the maternal genetic diversity and phylogeography study revealed that Andaman cattle is the outcome of Neolithic diffusion from centre of zebu domestication along with multidirectional commercial exchange between Indian subcontinent and ISEA.

As a part of the capacity building programme, a number of training, awareness and exposure visits were conducted for the farmers, students, stakeholders on agriculture and allied activities.

I thank all the officials of SMD for their support and all the staff members of our institute for their dedication and hard work for the growth and development of our institute.

Research highlights

Molecular analyses in Andaman Ordinary Tall population

B. Augustine Jerard, M.K. Rajesh and R. Sudha

Ten polymorphic SSR markers were used to amplify the DNA of 35 palms of Andaman Tall variety. A total of 525 alleles were detected. The average number of alleles (Na) are 1.83 alleles per locus. The average effective number of alleles per locus (Ne) is 1.52. Shannon's Information Index (I) ranged from 0.13 to 0.69 with a mean of 0.44. The polymorphism information content (PIC) value, which is a measure of polymorphism for a marker locus, varied from 0.06 to 0.50 among the 10 microsatellite loci with an average of 0.30. The number of polymorphic loci is 24 and percentage of polymorphic loci is 82.76%. A dendrogram was constructed using UPGMA clustering. Three major clusters were observed, among the Andaman Tall populations. The two populations *viz.*, Andaman 23 and Andaman 26 clustered in one group (Cluster III). Twelve Andaman Tall palms formed the cluster I (Andaman 1, Andaman 9, Andaman 10, Andaman 33, Andaman 7, Andaman 11,Andaman 19, Andaman 22, Andaman 5, Andaman 21, Andaman 14, Andaman 24). There maining twenty-one populations of Andaman Ordinary Tall formed the cluster II. The study will be useful in selecting better performing Andaman Ordinary Tall population.

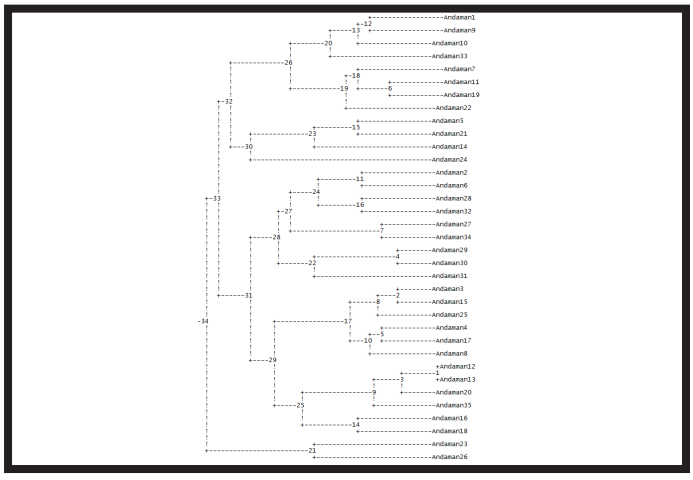

Plate 1 : Dendrogram using UPGMA clustering

All green – a better performing palak under island conditions

B. Augustine Jerard, Zamir Ahmed S.K. and I. Jaisankar

A comparative yield trial of three palak varieties comprising of All green, Pusa Bharati and Local variety revealed the better performance of Allgreen in terms of early and vigorous growth, multicut and yield of leaves under ridges and furrow system with alternate day irrigation during January- February. The cumulative harvest data showed that Allgreen yielded 4.5kg per square metre when compared to 2.9 kg and 2.1kg recorded by Pusa Bharati and Local variety. Allgreen reached the first harvest stage at 21 days after sowing whereas Pusa Bharati and Local variety took 28 days. The leaf length, breadth and number of leaves per plant was high in All green followed by Pusa Bharati.

Plate 2 : Palak varieties Allgreen (Left) and Pusa Bharati (Right)

Successful propagation of Bread fruit (*Artocarpus altilis*)

B. Augustine Jerard and I. Jaisankar

Successful attempts made to vegetatively propagate superior bread fruit types of South Andaman and over 90 plantlets obtained from root cuttings of identified trees were transplanted for further establishment. The observations revealed that root thickness of more than 2 cm diameter gave better production of suckers and higher vigour of plantlets. The height of plantlets, girth of plantlets, number of leaves at 4 months stage was higher among the plantlets obtained from thicker root cuttings. The optimum length of root cuttings was 10 to 15 cm. Dipping the root cuttings in IBA 500 ppm solution for 30 seconds improved the rooting in terms of root number and root length. The protocol could be used to accelerate the propagation of elite bread fruit trees in large number and the crop could be further promoted and supported in remote

places such as Nicobar Islands to strengthen the food security and climate resilience.

Plate 3 : Plantlets of bread fruit obtained from root cuttings

Diverse types of *Etlingera* spp identified in Nicobar Islands

B. Augustine Jerard and I. Jaisankar

The *Etlingera* spp, called torch ginger, the flowers of which are well-known local cut flower in the Islands, used for decorations and in bouquets. Exploration in Nancowrie group of Islands revealed the presence of wide diversity among the *Etlingera* plants found growing in cleared forested areas, arecanut/ coconut gardens which vary for plant height, leaf length, plant spread, flower colour, stalk length, flower size, number of fruits per bunch, fruit colour, fruit pulp content and pulp taste. The inflorescence positioning was also seen differently as erect, intermediate and prostratew with varying stalk girth, length and scale leaves. Although the plants are not under cultivation, the leaves, flowers, fruits and seeds are used by the local people for different purposes. The matured fruit bunches are relished by local tribes which are red or white or yellow or cream in colour and very sour or sour or blond or mild sweet in taste. The seeds are invariably black in colour in all the types whereas the seed number and seed size vary among the different plants.

Plate 4 *: Etlingera* with prostrate type of inflorescence and red coloured edible fruits

Performance of Tapioca, Sweet Potato, Colocasia and Greater Yam

B. Augustine Jerard and V. Damodaran

Varietal evaluation of sweet Potato, tapioca and Colocasia with released varieties and local collections revealed the better performance of Sree Vijaya followed by Sree Jaya in case of Tapioca in terms of higher tuber yield and cooking quality. The per plant yield ranged from 3.1 to 5.2 kg in Sree Vijaya in 10 months duration under Island conditions. In the case of Sweet Potato, the variety Bhu Krishna (a purple pulp variety being promoted for its bio-fortification properties) and a collection from Nicobar with white pulp showed better yield of tubers when compared to CARI SP-1and CARI Sp-2 whereas all the varieties recorded high level of weevil infestation. Bhu Krishna recorded up to 600g of single tuber weight. Among the six collections of Colocasia, the collection Diglipur Round recorded better yield of 720g per plant followed by HB -1 (639g per plant) and Diglipur Local (610g per plant). Polythene mulch in Colocasia improved the tuber yield to the tune of 30 to 50% owing to the absence of weeds. The collection BL was found to be better for leaf production and leaf cooking quality as vegetable. Among the four Greater yam collections evaluated for cooking quality, the collection Domrit Pink was ranked first for faster cooking, less stickiness and taste.

Plate 5 : Tapioca – Sree Jaya and Sree Vijaya

Plate 6 : Sweet Potato (Bhu Krishna)

Plate 7 : Colocasia (Diglipur collection)

Plate 8 : Greater Yam (boiled tubers of Domrit Pink)

Morphological and biochemical evaluation of tejpat (second season)

Ajit Arun Waman and Pooja Bohra

Andaman Islands, being a popular tourist destination, have good demand for the spices like Indian Bay leaf. To identify its superior germplasm for promoting cultivation in the islands, morphological and biochemical studies was carried out during the dry period in six collections. Results revealed differences among the collections for drying percentage (45.20 to 54.22%) and essential oil (0.40 to 0.45%). Photosynthetic pigments in fresh and dried leaves also showed variations among the studied collections. Colour variations in fresh and dried samples were recorded using Royal Horticultural Society colour chart.

Growth parameters of cinnamon varieties in arecanut plantation

In order to identify superior genotypes of true cinnamon for promoting cultivation as intercrop in the islands, five improved varieties are being evaluated in arecanut plantations along with local check. Analysis of data suggested variations for growth parameters such as plant height (46.1 cm to 93.2 cm), collar thickness (24.9 mm to 36.3 mm), number of primary branches (7.0 to 14.4) and canopy spread (77.3 cm to 114.4 cm).

CSS-MIDH (NHM) Project on Spices

Ajit Arun Waman

Andaman and Nicobar Islands have congenial agro-climatic conditions for commercial scale cultivation of true cinnamon. In order to promote cultivation of this ancient spice in the islands, systematic efforts were initiated through which planting material of cinnamon was provided to farmers/ stakeholders from various parts of the islands such as South Andaman Island (Ograbraj, Bird Line, Prothrapur, Caddlegunj, Wimberlygunj, Garacharma), Baratang Island, North and Middle Andaman Islands (Kalipur and Rangat) and Little Andaman Island (Harminder Bay). Further, considering the medicinal value of the spice, planting material was also provided to various stakeholders who participated in different training and awareness programmes conducted during the year. More than 4,000 plants were provided to these stakeholders for establishing the gardens.

Nucleus seed gardens of arecanut and coconut

Ajit Arun Waman

Nucleus seed garden of improved varieties of coconut and arecanut was established in the Garacharma farm to facilitate planting material production. Arecanut var. Samruddhi had plant height of 752.7 ± 23.24 cm, plant girth of 60.4 ± 1.84 cm, trunk height of 262.2 ± 10.14 cm and mean number of leaves per palm of 10.9 ± 0.23. Of the 32 mother palms, flowering has been initiated in eight palms during this year. In case of four varieties of coconut studied, variations were observed for plant height (245.7 cm to 379.6 cm), palm girth (35.0 cm to 59.01 cm) and mean number of leaves (7.8 to 10.4 per palm). The highest values for these growth parameters were observed in variety CIARI-Annapurna.

Evaluation of improved varieties/ hybrids of pepper in coconut

Ajit Arun Waman

To identify superior varieties/ hybrids of black pepper for cultivation as an intercrop in the coconut (ADOT) plantation, eleven genotypes were planted on glyricidia as standards at 2 m × 2 m in the interspaces of coconut. Analysis of the data after two years of planting suggested that there were no significant differences among the tested genotypes for plant height (211.8 to 531.6 cm), collar thickness (4.5 to 7.7 mm), number of primary branches per vine (1.4 to 4.7) and number of leaves per vine (69.4 to 261.0).

Exploratory studies in Ashwagandha and onion

Ajit Arun Waman and Pooja Bohra

In order to explore the possibility of growing ashwagandha under island condition, seedlings were raised and transplanted in pots filled with soil and FYM (3:1, v/v). The plants revealed good vegetative growth and flower induction; however in later stages, wilting was observed and the plants died. In onion, seedlings were raised and successfully transplanted after completion of nursery stage.

Plate 9 : Growth of ashwagandha under island conditions

Sensory evaluation of dehydrated woody pepper powder

Sensory evaluation of dehydrated woody pepper powder was carried out with 22 consumer panelists to know the acceptability of the product. Analysis was carried out using 7 points hedonic scale. Analysis of data suggested the mean score of 5.5 ± 0.17 for colour, 6.0 ± 0.22 for taste and 6.1 ± 0.15 for overall acceptability.

Conservation, bio-prospection and utilization of selected *Garcinia* Sp.

Pooja Bohra and Ajit Arun Waman

During the reporting period, collected and characterized seven collections of *Garcinia dhanikhariensis* and one unidentified species from South Andaman and recorded fruit morphological and biochemical parameters. Received IC numbers for 7 collections of *Garcinia* species collected from different parts of Andaman Islands. It included one collection of *Garcinia andamanica* (IC-0647383) and six collections of *G. dhanikhariensis* (IC-0647377 to IC-0647382). To popularize cultivation of Andaman Kokum in the islands, value added products were prepared from it. Sensory evaluation of syrup prepared from rind was carried out with 70 consumer panelists on 9-points hedonic scale. Analysis of results suggested the average scores of 8.03 ± 0.132 (colour), 7.94 ± 0.106 (taste), 7.39 ± 0.162 (aroma) and 8.17 ± 0.095 (overall acceptability) to the product.

Registration of a dwarf stature high yielding genotype with nutritionally rich fruit and seeds of noni germplasm

Dr. I. Jaisankar, Dr. B. Augustine Jerard

The Noni genotype CIARI Samridhi (TRA-1) has dwarf statured bush type plants. These are well suited for high density plants at 2.5 x 2.5 m distance as compared to 4.0-5.0 x 4.0-5.0 m for normal growing genotypes. It can tolerate partial shade condition hence, fits well for growing in coconut and areacnut plantations without compromising yield levels. CIARI Samridhi bears fruits year round and maintains around 38.46 % higher yield level than earlier identified genetic stock CIARI Samridhi. CIARI Samridhi (TRA-1) *Morinda citrifolia* accession has been registered by Plant Germplasm Registration Committee of Indian Council of Agricultural Research (INGR22093).

Third party monitoring report preparation for State CAMPA Projects

I. Jaisankar, B. Augustine Jerard, V. Baskaran, T. Subramani and R Jayakumara Varadan

As per the rules notified under the state CAMPA there is a provision for the third party monitoring or works undertaken from state CAMPA fund like plantation, water and soil conservation measures, wildlife management activities etc. In this connection Andaman Nicobar Forest Department various activities carried out CAMPA for their respective divisions. The proposal is to conduct third party monitoring of works undertaken from State CAMPA fund. The period of the CAMPA work will be considered w.e.f. 2010 to till date for the Diglipur, Mayabunder, Middle Andaman, Baratang, South Andaman and Nicobar Forest Divisions.

Plate 10 : Third party monitoring of CAMPA by CIARI

Pandanus seed oil chemical profiling

I. Jaisankar, B. Augustine Jerard, A. Velmurugan and R. Jayakumara Varadan

Seed oil from *Pandanus tectorius*, *P. lerum* and *P. odorifier* analyzed for its fatty acid profile. The results revealed that the highest saturated fatty acid of 40.09% was observed in *P. tectorius* seed oil. The highest polyunsaturated fatty acid of 27.06% and monosaturated fatty acid of 35.98% was recorded in *P. odorifer* seed oil while all the three species seed oil recorded below 1% transfatty acid.

Sequential cropping under Padauk plantation

I.Jaisankar, B.Augustine Jerard, T.P. Swarnam and T. Subramani

Bhendi, brinjal and chilli fruit yield was recorded from the sequential cropping trial from the trial

Bhendi performed well under the Padauk based sequential cropping system with the average yield of 0.72 kg/plant.

Mangrove community zonation mapping

I. Jaisankar

The mangrove patches were mapped using field survey information and IRS LISS IV imagery in 1:2,50,000 scale, covering an area of 790.06 sq. km from North Diglipur to South of Little Andaman. Notably, *Acanthus ebracteatus* was recorded only in the South Andaman region, while *Heritiera littoralis* was found only in North and Middle Andaman, specifically in Baratang, Dhani nallah and Yerrata Jetty. Further, *Nypa fruticans* was found as a pure patch of palm mangrove population in South and Middle Andaman, while the Rhizophoraceae family was found to be the most important constituent of the vegetative structure in the mangroves of Andaman group of Islands, followed by Acanthaceae, Lythraceae, and Malvaceae. Eventually, the dominant species in Andaman Islands was found to be *Rhizophora apiculata*, followed by *Bruguiera gymnorrhiza*, *Ceriops tagal*, *Rhizophora mucronata*, *Bruguiera cylindrica*, *Excoecaria agallocha*, and *Xylocarpus granatum*.

Augmenting livelihood, resilience, and knowledge generation through coastal fisheries information hub for Nicobar tribes of Car Nicobar Island

R. Kiruba Sankar, D Karunakaran, J Praveenraj, K Saravanan, Sirisha Adamala, Y. Ramakrishna

The first baseline information on the prevalence of marine debris in Car Nicobar was reported and published under the project. The surveys revealed that the beaches of Car Nicobar were heavily loaded with plastic debris particularly of foreign origin. Clean Coast Index (CCI) values revealed that the beaches were classified as dirty to extremely dirty category. Coastal cleanup initiatives were taken up in Car Nicobar with the involvement of tribal fishers to generate awareness on the ill effects of plastic litter. Citizen science activities initiated in the Car Nicobar Island through the project revealed better understanding on the seaturtle diversity of Car Nicobar. Sea turtles such as Green turtle (*Chelonia mydas*), Hawksbill turtle (*Eretmochelys imbricata*), and Olive ridley turtle (*Lepidochely solivacea*) were reported from our surveys in Car Nicobar Island during the period. Local ecological knowledge on the nesting and sea turtle tracks were also collected from the tribal fishermen. The Malayan box turtle (*Cuoraamboinensis*) was recorded from the freshwater streams of Car Nicobar during the period being a rare record of freshwater turtle from Car Nicobar.

Mapping the brackish water resources of South Andaman for aquaculture site suitability using GIS approach

R. Kiruba Sankar, Sirisha Adamala, K. Saravanan and J. Praveenraj

The inundated water bodies in sites such as Sippighat, Flat Bay, Ograbraj, Wandoor, Namunagar, Danduspoint were mapped using the Sentinel-2 images during the period. In-situ field observations on the extent of water spread in the mapped water bodies along with the soil and water sample analysis was being carried out. The coral reefs, mangroves, protected areas, marine national parks, roads etc were also mapped along with the inundated water bodies. The suitability of the inundated waters would be evaluated based on multi criteria decision making approach.

National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)

K. Saravanan, J. Praveenraj & R. Kiruba Sankar

Under the passive surveillance, baseline data has been collected with geo-reference details from a total of 50 freshwater fish farms located at various villages of North and South Andaman. Altogether, nine number of disease cases have been reported due to bacterial, parasitic and fungal pathogens such as *Aeromonasveronii, Aeromonascaviae Dactylogyrus* sp., *Gyrodactylus* sp., *Achlya* sp., *Octolasmis* sp., *Ichthyophthirius* sp. and *Paracamallanus* sp. Characterized the shellfish parasite, *Octolasmis* sp. through DNA sequencing of cytochrome c oxidase subunit 1 (COI) gene. Participated in the inter-laboratory comparison for the molecular detection of three finfish and shrimp pathogens conducted by the coordinating agency, i.e. ICAR-NBFGR, Lucknow. Altogether, three number of awareness programmes were conducted on aquatic animal disease surveillance and health management at South Andaman with 80 number of participants.

Deciphering the *in-vitro* bioactive potential of selected seaweed species of Andaman Islands and evaluation of its immunomodulatory effect on fish

K. Saravanan, J. Praveenraj, R. Kiruba Sankar

Surveys were conducted at Burmanallah and Chidiyatapu coasts of South Andaman and collected the seaweed samples comprising of red (*Gracilaria* spp., *Hypnea* sp., *Acanthophora* sp.), brown (*Padina* sp., *Turbinaria* sp., *Sargassum* sp.) and green seaweeds (*Halimeda* sp., *Dictyosphaeria* sp.). Analysedthe proximate composition (moisture, ash, carbohydrate, lipid and fibre) for all the collected seaweed species. *In-vitro* assays such as ABTS (2, 2-Azinobiz-3-Ethylbenthiazoline-6-Sulfonic Acid) and DPPH (1, 1-Diphenyl-2-Picrylhydrazyl) activities were carried out for all the collected seaweed species by using five different solvents such as ethanol, methanol, aqueous, acetone and chloroform.

Prevalence of parasites infesting commercial marine and freshwater fishes of the Andaman Islands

J. Praveenraj & K. Saravanan

First report of *Ichthyophthirius* sp. a protozoan parasite was recorded in native and endemic freshwater fishes of the Andaman Islands for the first time *i.e.* in *Redigobius tambujon* and *Sicyopterus garra.* Numerous infective trophonts were attached on the host body surfaces and fins causing mortality**.** This outbreak constitutes the first report of parasitic infestation in native and endemic freshwater fishes of the Andaman Islands.

Standardization of freshwater aquariculture practices to promote livelihood and employment opportunities in South Andaman

J. Praveenraj, K. Saravanan & R. Kiruba Sankar

New strains of *Betta splendens* namely, Black Samurai (BS), Dumbo Ear (DE), Giant Plakat (GP) and Yellow Dragon (YD) have been procured from mainland for seed production**.** Three strains namely, BS, DE and YD were successfully bred and seed production techniques were standardized. Broodstocks of goldfishes, Neon Tetras, and Angel fishes were developed for breeding in the pre-monsoon. Native aquatic ferns, mosses, *Crepidomanes* sp. were collected and its cultivation techniques were standardized for propagation.

Exploration of fishery, biology and market potential of tuna resources of Minicoy

The structured questionnaire was prepared to find out operational performance and catch composition and data were collected from 5 vessels. The biological analysis of two tuna species i.e. skipjack, yellow fin tuna and long tail tuna, a total of 71 samples were dissected with length measurements recorded on weekly intervals. Three species were used as bait fish during the period. Ichtyofaul diversity studies were carried at landing and intertidal area. Field trial was conducted for seaweed farming at Minicoy in association with Administration. One PVC raft of 3x3 m dimension was and samplings of *Gracillaria* sp done and kept at lagoon near harbour side for performance studies. The seeds for the same were collected from Kavarathi. A low cost FAD was made for squid aggregation which is placed near harbour side of sea for evaluation.

Integrated farming systems for enhancing sustainable livelihood of rural tribal community of Minicoy

Y. Gladston, S.M.Ajina & S,K.Zamir Ahmed

The layout of the coconut based integrated farming system was made and 5 number Konkan Kanyal goats (15-22 Kg) were introduced for first time in Lakshadweep islands for performance studies from ICAR-CCARI, Goa, beside 234 chara-chemballi duck eggs and 207 sasso chicken was kept in mini-incubator for hatching. Floating hydroponics prototype was made to find out feasibility of coriander culture and introduced black pepper, all spice and grafted nutmegs for multiplication and popularization.

Maternal genetic diversity and phylogeography of Andaman cattle

Arun Kumar De, Debasis Bhattacharya, Perumal Ponraj, Jai Sunder, T. Sujatha, & Eaknath B Chakurkar

Andaman cattle is a precious indigenous livestock species indigenous to Andaman and Nicobar Islands, India. The genetic diversity, population structure of Andaman cattle and their evolution in the context of epicentre of zebu domestication were evaluated based on mitochondrial D-loop sequence information. The complete mtDNA D-loop sequence information of 150 Andaman cattle was generated and the generated sequence information was deposited

to GenBank (https://www.ncbi.nlm.nih.gov/genbank/) with accession numbers MK872811-MK872960.A total of 81 haplotypes (ANCHT1-ANCHT81) were identified in Andaman cattle with haplotype diversity (Hd ± SD) of 0.968 ± 0.008. Based on the Neighbor Joining (NJ) phylogenetic tree of ANC haplotypes with standard cattle haplogroups (T1, T2, T3, T4, I1, I2, P, R, Q), all the haplotypes except three belonged to Bos indicus I haplogroup (Figure 1). Among I haplogroup, 20 haplotypes belonged to haplogroup I2 and 58 haplotypes belonged to haplogroup I1 (Figure 1).The presence of taurine haplotypes in Andaman cattle indicate introgressionby European-derived cattle. A poor phylogenetic signal of Andaman cattle with genetic affinities with cattle of Indian subcontinent and Isnad Southeast Asia (ISEA) was observed. The poor phylogenetic structure may be due to multidirectional gene flow from Indian subcontinent and ISEA, with which Andaman shares a close cultural and trade relationship from Neolithic age. We hypothesize that Andaman cattle is the outcome of Neolithic diffusion from centre of zebu domestication along with multidirectional commercial exchange between Indian subcontinent and ISEA.

Neighbor Joining (NJ) phylogenetic tree of ANC haplotypes with standard cattle haplogroups. The GenBank accession numbers of the standard haplogroups used are as follows; I1=L27722 and AB268579, I2= EU177869 and AB268559, T1= LC013968, T2=AB117049, T3=V00654, T4=LC013966, R= HQ184045, P= DQ124389, Q= EU177867. GQ464312 for *Bos grunniens*and EU177871 for *Bison bison*were used as out-groups. NJ tree was drawn in MEGAX.

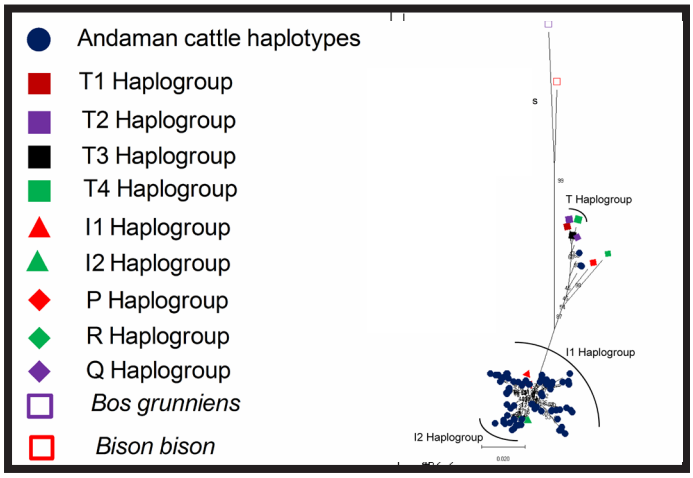

Plate 11 :Haplogroup assignment of different haplotypes of Andaman cattle (ANC).

Success Stories/case report

An integrated plantation-based IFS model

Debika Dhali is a landless labor and lost her livelihood opportunities during COVID pandemic. After seeing agricultural and allied activities are the ones not affected by the Pandemic, she decided to take land on lease and she along with her friend leased 6 bighas of land for 10 year period on 50:50 sharing basis in 2021. They planted 50 coconut seedlings and banana suckers in an area of 3 bighas on the slopes. And the plain land was cleaned and leveled for production of seasonal vegetables like Burma dhaniya, okra, brinjal and other leafy vegetables. In farm pond IMC was grown and water was utilized for growing vegetables during dry season. From vegetable cultivation she earned around Rs.25 to 30,000 in 2021. An integrated plantation-based IFS model was demonstrated in farmers unitwas made to provide permanent shelter for goat, poultry and composting of crop /farm wastes. In addition to the permanent livestock shelter, she was also given 5 numbers of goat kids (4+1), 50 vanaraja birds and composting bag for residue recycling. The seedlings of black pepper, clove, nutmeg and cuttings of CN hybrid were distributed and planted as intercrops in the existing plantations for crop diversification. Glyricidia was used as border crop. The training for composting of crop residues, livestock management was imparted. The vanaraja birds were allowed to go for free ranching and also concentrate feed is also provided. The birds were sold for meat purpose within 3 to 4 months after attaining average weight of 1.75 to 2.0kg. In a year she could raise 2 cycles. The goats were first introduced in the farm, allowed for open grazing in wastelands and village commons. The poultry waste and crop residues along with goat manure were composted in the compost bags and compost is utilized for raising vegetables. Because of this intervention, the family is getting a net income of Rs.72,000/- from the interventions besides producing compost (3-3.5t) resulting in a saving of Rs.9500/- towards the cost of purchasing fertilizers. After seeing the success of poultry production in their own farm, the partners decided to expand the same. They started rearing 400 birds (vanaraja) mainly for meat purpose after making temporary shelter by their own investment. They were successful in recording an income of Rs.1.74 lakhs in one

cycle of 4 months duration. The cultivation of seasonal vegetables resulted in Rs.45000/ and goat component yielded around Rs.18000/- . This intervention helped to uplift a landless labour to a share cropper with average annual income of Rs. 2.91 laks with net sharing of 1.5 lakhs.

Contributors

T P Swarnam, P Perumal & A Velmurugan

Plate 12 :Debika Dhali

Case Study

Roof Top Gardening in Minicoy Islands, Lakshadweep

Farmers profile:

Name	:	Mr. Mohammed Manikfan Furakkad
Address	:	Alikeugothi, Aloodi Village, Minicoy Island
Village	:	Aloodi Village
Phone	:	04892-222570
Family size	:	3
Total land area	:	10 cents
Number of livestock	:	NIL
Crop area		90 sqm (Terrace Cultivation)

Situation analysis

Shri. Mohammed Manikfan Furakkad, aged 67 years from Minicoy Island, Lakshadweep, dropped his early education when he was at 10 years old. His adolescence was spent working with his father in a ship called M.V Amindivi in the canteen as a canteen boy. After 10 years working in the ship he left the sea life and decided to start something in the land. During 1985, he was first person to run an incubator at Minicoy Island with 100 eggs capacity . Therefore, he reared 300 poultry both broilers and layers along with that he used togrow vegetables in the backyard. He is dedicated towards his work and very often visit ICAR-CIARI, RS, Minicoy for purchasing vegetable seedlings and getting scientific know how & do how. ICAR-CIARI scientific team alsovisited his site and encouraged him to go for Terrace Cultivation with crops of the choice of the people. Thereafter he attended several trainings as and when conducted by the station which gave him confidenceon the venture and made him start with Solanaceous vegetables like chilli and brinjal in an area of 56.75 sqm in the terrace. Vegetables like Chilli, Brinjal, Okra, Tomato, Sponge gourd, Ivy gourd, Pumpkin, Water melon, Passion fruit and Mint was included in the list. As chilli is mostly liked by the people of this Island he maintained 80 bags of chilli along with other vegetables. Weekly he used to harvest nearly 5-6 kg of chilli and distribute to his neighbours and fellow beings. He adds and believes in the principle that *"The one who gives, will only gain"*. During 2023, month of January for the first time he sold 15 kg chilli, 10 kg brinjal for a local marriage function Minicoy.Apart from vegetable cultivation he is also an expert and well known fisherman and makes lead baits for fishermen communities at low cost.

Technology Interventions

Scientists of the ICAR-CIARI provided all the technical guidance regarding scientific cultivation and management practices including pest and disease management,& bio fertilizers preparation. The area has increased to 90 sqm area under chilli, brinjal, okra, tomato, sponge gourd, ivy gourd, pumpkin, water melon, passion fruit and mint cultivation which is managed in grow bags for household and commercial purpose.

Impact / Outcome of technology adoption

With the technical support of the ICAR-CIARI, knowledge regarding the preparation of bio-fertilizers like bio-slurry and fish amino acid boosted his cultivation and fetched additional income for his family and his is looking forward to enhance the area in an advanced manner.

Income generation

First revenueof Rs.15000/- was generated and more is still to come.

Way forward

He along with his family is very happy and satisfied for the technical guidance from the

ICAR-CIARI team and he is looking forward to upgrade the terrace cultivation to advanced protected cultivation by establishing a greenhouse with semi modern facilities under the technical guidance of R.S. Minicoy.

Contributors

Gladston Y, Ajina S.M, Sharefuddeen Hassan Kararngothi, Arif M.I, S.K Zamir Ahmed & E. B. Chakurkar

Plate 13 : Mr. Mohammed Manikfan Furakkad

Bada, Aoumagu, Boduathiri, New Boduathiri, Rammedu, Sadivalu, Aloodi, Funhilol, Kudehi, Fallessery and Kendipartycluster of villages and South Pandaram to sensitize about IPM practices.On the concluding day inputs like Pheromone trap with lure for melon fly and fruit fly control were provided to the farmers in presence of the officials of Department of Agriculture Shri. Kunjikoya.

Plate 14 : Sensitization on IPM at RS Minicoy

Important events held

Sensitization on IPM & input distribution under STC, at Regional Station Minicoy, Lakshadweep of ICAR- CIARI, conducted

Regional Station, Minicoy of ICAR-CIARI Port Blair, conducted a "Sensitization on Integrated Pest Management (IPM) under Schedule Tribe Component (STC)" for the welfare of tribal farmers of Minicoy from 09th to 13th January2023. Speaking on the inaugural occasion, the Chief Guest Dr Shrikant R. Tapdiya, the Deputy Collector of Minicoy expressed his happiness on the technological intervention in Nutritious kitchen garden, and roof top gardening, beside on the R & D activities and new initiatives of ICAR-CIARI, Regional Station, Minicoy.The scientific team comprising of Dr. Gladston Y. and Dr. Ajina S. M. interacted with the farmers and impressed upon nutritious kitchen garden, backyard vegetable farming and fruit production technology and on the pest and diseases and how to control through IPM involving biological methods. Shri. Shareefuddeen Hassan, Senior Technical Assistant and Shri. Arif M.I., Senior Technician and the Coordinator of the programme informed about the technical know-how and do-how to the participants in 'Mahl' (the local language).The scientific team visited

A total of 47 females and 34 male tribal farmers totaling to 81 got benefited by the program. Dr. Ajina S.M, and Dr. Gladston Y, Convener, Coordinator Shri Shareefuddeen Hassan & Shri Arif M.I., Dr.S.K. Zamir Ahmed, Nodal Officer, Lakshadweep coordinated the overall conduct of programme under the Chairmanship of Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI, Port Blair.

ICAR-CIARI organized training on Tuber Crops cultivation practices

ICAR-CIARI organized two training programmes on 'Improved tuber crops cultivation practices and regenerative agricultural practices for the benefit of farmers from North and Middle Andaman district in collaboration with Krishi Vigyan Kendra- Nimbudera under All India Coordinated Research Project on Tuber Crops on 24th and 25th January 2023 at Pahalgaon in Mayabunder zone and Dharmapur villages of Shivpuram panchayat. A total of 50 farmers have attended the training programmes and participated in the interactive sessions covering the aspects on scope of tuber crops cultivation, inter/mixed cropping in plantation-based cropping systems, improved cultivation packages for tuber crops and regenerative agricultural practices for sustainable production. The farmers were imparted knowledge on the benefits

Plate 15 : Training on Tuber Crops cultivation practices

Plate 16 : Republic Day celebration

of tuber crops cultivation for enhanced food security, scope for value addition, use of quality planting material, climate resilence of tuber crops, alleviating malnurition through tuber crops products from tubers and leaves and the marketing opportunities. Besides, information on the component crops in plantaion crops based cropping systems were also disseminated which includes spices, coconut, arecanut, fruits and other vegetables along with tuber crops. The programme was conducted and coordinated by Dr. B. A. Jerard, Head, Division of Horticulture and Forestry & PI of AICRP on Tuber crops, Dr. Damodaran, CTO and Co-PI, AICRP on Tuber crops, Dr SK Zamir Ahmed, Principal Scientist and Mr. Manoj, SMS, KVK-Nimbudera at North and Middle Andaman district under the overall guidance of Dr. E.B. Chakurkar, Director, ICAR-CIARI, Port Blair. During the programme, planting material of improved varieties of Elephant Foot Yam, Sweet Potato, Colocasia and Tapioca were distributred to the farmers.

ICAR-CIARI Celebrates Republic Day

ICAR-CIARI, Port Blair celebrated the 74th Republic Day with great patriotic zeal and fervour on 26.01.2023. Dr. E.B. Chakurkar, Director, ICAR-CIARI unfurled the tricolour flanked by staff and family members. In his address, he appreciated the scientists and staff for the achievements made by the Institute during the past one year with a special mention about Dr. A. Velmurugan, Principal Scientist joining as Assistant Director General (S&WM) at ICAR Headquarter, New Delhi. He further, appreciated Scientists and all team members of Social Science Section for organizing Agriculture Education Day to create awareness about agriculture and agricultural education among school children and also he lauded the work carried out by Scientists of Regional Station, Minicoy for demonstrating and popularising CIARI technologies in the regions of west coast. During his speech, he elaborated achievement of r esearch and development of the Institute par ticularly release of Dwarf coconut varieties (Dweep haritha and Dweep Sona), proposals for registration of new animal breeds, registration of Morinda citrifolia cluster bearing accession and CARI Brinjal 2. He also highlighted the recent technologies commercialised by the institute like Dweep Tickure, Dweep-GauMa Humpsore Rakshak, Dweep-Vertigrow, and Process for extraction of calcium alginate and liquid fertilizer from seaweed. During this occasion, he inaugurated KOHA, an integrated Library Management System in Institute Library to access library books and catalogue online through web browser. He further urged everyone to work hard for the betterment of the Institute

ICAR-CIARI organized awareness programmes on aquatic animal disease surveillance and mud crab culture and fattening

ICAR-Central Island Agricultural Research Institute organized two awareness programmes on “National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)” and “Scope of Mud Crab Culture and Fattening in Andaman Islands” on 15th February, 2023 at Guptapara of South Andaman. A total of about 35 farmers attended the awareness programmes and participated in the interactive sessions covering the aspects on aquatic animal diseases and its management, better management practices in aquaculture, scope of mud crab culture and

fattening in Andaman Islands and significance of mobile apps in fisheries and aquaculture. During the programme, the queries raised by the farmers were also addressed by the Scientific team.

In his address, Shri. Durlav Das, Pradhan, Guptapara panchayat appreciated the efforts of ICAR-CIARI to conduct such programmes benefitting the farmers of Guptapara Panchayat. The programmes was conducted and coordinated by Dr. S.K. Zamir Ahmed, Head I/c, Division of Fisheries Science, Dr. R. Kiruba Sankar, Senior Scientist, Dr. K. Saravanan, Scientist, Dr. J. Praveenraj, Scientist and Dr. D. Karunakaran, Scientist under the overall guidance of Dr. E.B. Chakurkar, Director, ICAR-CIARI, Port Blair.

Plate 17 : Awareness programmes on aquatic animal disease

Exposure Visit for DIET students to ICAR-CIARI

An Educational trip was conducted to enlighten the young minds of 120 students of Dr. S. Radhakrishnan District Institute of Education and Training (DIET), Garacharma, South Andaman, along with six faculties on the ongoing in Integrated Farming System, Horticulture nursery & Animal Science field activities at Garacharma Research Complex of ICAR-CIARI, Port Blair on 15th February 2023.

Dr.T.P. Swarnam, Principal Scientist & Head I/C Natural Resource Management Along with Dr. T. Subramani, Senior Scientist dwelt in length and gave practical exposure on the Integrated Farming System & Vermicomposting. Dr. P. A. Bala, Senior Scientist, Animal Science Division showcased the fodder block, Andaman & Terresa goat. Dr. Ajit Arun Waman & Dr. Pooja Bohra, Scientists gave the practical exposure on the endemic fruits, spices & medicinal plants along with its uses and propagation technique. Students were also exposed to the library of the Institute.The students expressed their happiness on the knowledge gain due to exposure to ICAR-CIARI and interacted with the team of Scientists to get their doubts cleared. They also showed interest in seeing the other activities during future visit.

Earlier Dr. S.K. Zamir Ahmed, Principal Scientist & Head I/c Fisheries Science Division welcomed and introduced the Institute and its role in furthering agriculture in these Islands, beside he stressed on building up scientific temperament, and becoming the ambassador of ICAR-CIARI hereafter. Shri. D. Karunakaran and Dr. K. Saravanan, Scientists were also present.

Plate 18 : Exposure visit of DIET students

The visit was coordinated by the team, comprising of Dr. S. K. Zamir Ahmed, Principal Scientist & Head I/C FSD, Shri. D. Karunakaran, Scientist, along with Smt. Asma Bibi Technical Assistant, Shri Ali Akbar Technician, Mr. Amit Roy & Mr. M. Saravanan under the plan & guidance of Dr. Eaknath B Chakurkar, Director, ICAR- CIARI, Port Blair

Exposure visit of college students to Horticulture Plants Propagation Unit

Fifty Bsc. students along with four faculty members from Tagore Government College of Education (TGCE), Middle Point, South Andaman visited Horticulture Plants Propagation Unit at Garacharma Research Complex of ICAR-CIARI, Port Blair as part of National Science Day on 24th February 2023.Dr.E.B. Chakurkar, Director, ICAR-CIARI interacted with students and faculty members. In his address he encouraged the students to keenly interact with the Scientists. He also encouraged them to build up scientific temperament, and

becoming the ambassador of ICAR-CIARI. Dr. Ajit Arun Waman & Dr. Pooja Bohra, Scientists of Horticulture & Crop Improvement Division deliberated upon practical exposure on the endemic fruits, spices & medicinal plants, tissue culture along with value addition of fruits and spices and its uses. The studentsshowed keen interest& expressed their happiness on the knowledge gained due to exposure to ICAR-CIARI and interaction with the team of Scientists.The visit was coordinated by the team, comprising of Dr. S. K. Zamir Ahmed, Principal Scientist & Head I/C FSD, Shri. D. Karunakaran, Scientist & Coordinator, along with Smt. Asma Bibi Technical Assistant, Shri Ali Akbar Technician, Mr. Amit Roy & Mr. M. Saravanan under the plan & guidance of Dr. Eaknath B Chakurkar, Director, ICAR- CIARI, Port Blair.

Plate 19 : Exposure visit of DIET students at Horticulture propagation unit

Training programme on Biological control of house fly and mosquito

Animal Science Division of ICAR-CIARI initiated intervention towards biological control of flies and mosquitoes. This is needless to mention that, both flies and mosquitoes create great menace by transmitting bacterial, viral and parasitic infection in man and animals. In general chemical insecticides are used to control these pests. But continuous use of chemical insecticides leads to insecticide resistance and there is also chance of contamination of insecticide in animal-human-plant continuum. To resolve the issue, ICAR-CIARI initiated campaign on biological control of flies and mosquitoes with the use of commercial preparation of *Bacillus thrugiensis isrealensis* alias *bti*which kills the larval stage of the pest by perforating their mid gut. To initiate the campaign a training programme was conducted from 28th February to 2nd March, 2023 under a NABARD funded project on " Control of *in refugia* and in house invasive flies of livestock in organized and unorganized herds of South Andaman District".

The training was a joint venture of ICAR-CIARI and Department of Animal Husbandry and Veterinary Services under A&N Administration. The training initiated with a brief note on importance of fly and mosquitoes which was narrated by Dr. Debasis Bhattacharya, Principal Investigator of the project. Dr. Jai Sunder, Principal Scientist and HOD, Animal Science Division of ICAR-CIARI explained the role of fly for transmission of zoonotic diseases and also explained in brief about the amenities available with the Division of Animal Science.

Plate 20 : Training programme on fly control

Further, Perumal Ponraj, Senior Scientist, Animal Science Division elaborately imparted training on probable causes of infertility in cattle and goat. Dr. P.A. Bala, Senior Scientist (Animal Nutrition) briefed about effect of plane of nutrition to avoid parasitic infestation. The training programme was very nicely coordinated by Dr. Baljit Kaur, Senior Veterinary Officer, Veterinary Hospital, Garacharma for conducting lecture and live practical demonstration. The training was attended by 28 local farmers and they were provided with commercial preparation of *Bacillus thrugiensis isrealensis*, the biological weapon to control mosquitoes and flies.

Capacity building programme on organic farming for Nicobari tribal farmers

Under Scheduled Tribe Component of ICAR-CIARI, a team of Scientists from CIARI has conducted a 5-day capacity building programme on "Potential of organic farming under Island

based cropping system" for Nicobari tribal farmers from 7th to 11th February 2023. The training was conducted at Pilpillow, Hitui, Chota Inaka, and Kakana villages in Nancowrie group of Islands in the Nicobar district with the enthusiastic participation of tribal Captains and tribal members of the respective villages. During the training sessions, Dr. B.A. Jerard, Principal Scientist (Horticulture) gave insights on organic cultivation of vegetables and tuber crops to ensure nutritional security and scientific organic cultivation of coconut and arecanut, Dr. Y. Ramakrishna, Principal Scientist & Head, KVK elaborated on organic residue management under natural farming system and integrated pest and disease management, Dr. I. Jaisankar, Senior Scientist (Forestry) stressed the importance of conserving endemic plant biodiversity to succeed in organic farming, and Dr. R. Jaya Kumaravaradan, Scientist (Agricultural Economics) detailed the production prospects of organic coconut based value added products and their marketing. The participants were imparted knowledge on organic farming with recycling of plantation wastes and residual management under natural farming system, conservation of endemic plant biodiversity from climate change, scientific organic cultivation of coconut and arecanut, production prospects of organic coconut-based value-added products and their marketing, organic vegetable cultivation for nutritional security, organic tuber crop cultivation and organic waste management. Suggestions were also made to promote component crops such as bread fruit, tuber crops and tree crops in the plantation-based systems. Pest management in organic vegetable cultivation through yellow sticky trap and pheromone trap were explained. Demonstrated pheromone trap for fruit flies in cucurbits, and the functioning of yellow sticky trap to control whiteflies and other sucking pests. Based on the requirement of the trainees, the team has worked out a capacity development programme for coconut value addition through Coconut Development Board.The tribal captains (Mr. Frazer of Kakana, Mr. Tanvir of Pilpillow, Mrs. Elezebeth of Hitui, Mr. Charles Jacob of Chota Enaka), their second captains and tribal council members were present during the interactive meetings and input distribution. As a part of the programme, farm implements, farm inputs and planting material were distributed to the tribal farmers under STC programme of ICAR-CIARI and AICRP schemes. The whole programme was coordinated by the team of scientists under the guidance of Dr. E.B. Chakurkar, Director, CIARI. The details of inputs distributed are as follows.

Kakana village: 64 tribals (44 male and 20 female): Vegetable seed kit (60 nos.), pruning knife (20 nos.), sickle small (50 nos.), sickle big (50 nos.), shovel (50 nos.), tapioca setts (100 nos.) and grass cutter (2 nos.)

Pilpillow village: 72 tribals (55 female and 17 male): Secateurs (70 Nos.), hand saw (70 Nos.), axe (70 nos.), grass cutter (2 nos.), pvc coated chain link (1500 m length), and vegetable seed kit (70 Nos.)

Hitui village: 60 tribals (39 male and 21 female): Secateurs (60 Nos.), hand saw (60 Nos.), grass cutter (2 Nos.), axe (60 nos.), tapioca setts (100 Nos.) and vegetable seed kit (60 Nos.), pvc coated chain link (600 m length)

ChotaEnaka village: 30 tribals (10 male and 20 female): Vegetable seed kit (22 Nos.), yellow sticky trap (20 packs.), two sizes of grow bag (40 nos.), cue lure pheromone kit (30 Nos.)

Training on Coconut Handicrafts

The Institute has organized a Coconut Development Board sponsored training programme on 'Coconut Handicrafts' for the benefit of Island youth to enhance and utilize the entrepreneurship opportunities in collaboration with ICAR-KVK, South Andaman from 6th to 13th March 2023 in which 15 women from Andaman and Nicobar Islands were imparted hands-on training on use of different parts of coconut palm in handicrafts making. The trainees were provided necessary tool kits and training material to practice and implement their entrepreneurship using coconut shell, husk, leaf, spathe and flower parts. Scientists have highlighted the scope of Coconut handicrafts from the bay islands, opportunities for marketing, different coconut handicrafts from around the world to the trainees during the sessions. Mrs. Shoba Rani from south Andaman has assisted as the master craftsperson for the training. Hands on training sessions on selection and preparation of coconut parts, polishing, finishing, designing, display were held. The trainees have exhibited the best coconut handicrafts made by them during the training on the concluding day and the best performers were awarded by ICAR-CIARI. During the valedictory session, the trainees expressed their happiness over the new skill and knowledge they could gain from

Plate 21 : Training on coconut handicraft

Plate 22 : Training on vegetable cultivation at RS Minicoy

the training to produce wealth from waste. The six days training programme was organized and coordinated by Dr. B. A. Jerard, Course Director cum Principal Scientist, Division of Horticulture and Crop Improvement and coordinated by Dr Y Ramakrishna, Head, KVK-South Andaman, Dr. V Damodaran, CTO, Dr SK Zamir Ahmed, Principal Scientist, Dr Jaisankar, Senior Scientist and Dr. Pooja Kapoor, SMS, KVK-South Andaman district under the overall guidance of Dr. E.B. Chakurkar, Director, ICAR-CIARI, Port Blair.

Vegetable cultivation (Cabbage & Cauliflower) under coconut plantation,at Regional Station Minicoy

Regional Station, Minicoy of ICAR-CIARI Port Blair, conducted a "Field Day on Vegetable cultivation (Cabbage & Cauliflower) under coconut plantation" for the tribal farmers of Minicoy on 1st March 2023. Speaking on the inaugural occasion, the Chief Guest Dr. Shrikant R. Tapdiya, the Deputy Collector of Minicoy expressed his happiness on the ICAR-CIARI Regional station technologies for vegetable farming and nutritious kitchen garden. A total of 15 participants including 12 men and 3 farm women from Funhilol, Fallessery, Aoumogu, Bada, Rammedu, and South Bandaramat tended the field day in which they were exposed to a scientific cabbage & cauliflower cultivation at the institute farm.The scientific team comprising of Dr. Gladston Y. and Dr. Ajina S. M. interacted with the farmers and impressed upon the package of practices for organic Cabbage & Cauliflower cultivation under coconut plantation during the season. As cabbage & Cauliflower is one of the highly demanded vegetable in Lakshadweep islands, the farmers were highly fascinated by this potential crop and its farming, which can be successful to earn high returns in short period of time.A total of 98 number fully matured cabbage and 18 number fully matured cauliflower were harvested in the presence of Deputy Collector, Minicoy and officials of Department of Agriculture, Minicoy UnitShri. Kunjikoya. A total of 12 men and 3women farmers participated.Dr. Gladston Y, & Dr. Ajina S.M Convener, Shri Shareefuddeen Hassan& Shri Arif M.I., Dr. S.K. Zamir Ahmed, Nodal Officer, Lakshadweep coordinated the overall conduct of programme under the Chairmanship of Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI, Port Blair.

Training on harvest and post-harvest management of spices

A training programme on 'Scientific harvesting and postharvest management of spices in Andaman Islands' was organized at ICAR-Central Island Agricultural Research Institute, Port Blair under the Directorate of Arecanut and Spices Development, Calicut funded CSS-MIDH (NHM) Project on Spices and AICRP on Palms project. During the introductory session, Dr. Ajit Arun Waman, Scientist-SS (SPMA) and coordinator of the training programme, emphasized that spices are the cash crops having immense potential for cultivation in the Islands. However, to promote the island spices, adoption of scientific practices is required as the quality of the produce is largely dependent on it. He informed the gathering about market trends and quality issues of various spices in the domestic markets and urged the stakeholders to come forward to develop islands as hub of quality spices.

During the technical session, Dr. J.H. Kadam, Associate Professor, Dr. BSKKV, Dapoli, Maharashtra, who is a renowned expert and advisor to Government of Maharashtra on turmeric delivered a video presentation on processing of turmeric for commercial as well as home/ cottage scale units. He elaborated on various traditional and advanced methods of turmeric processing and avenues for product diversification. Dr. Ajit gave a presentation on techniques for scientific production and processing of various spices. He showcased various spice samples and explained the methods to differentiate the good quality produce from the inferior one. Dr. G.N. Khadke, Scientist-SS, ICAR- Directorate of Medicinal and Aromatic Plants Research, Anand, Gujarat delivered a video presentation on techniques of extraction of essential oils from spices and aromatic plants. Various machineries involved in the process and mechanism were explained to the participants during the presentation.

During practical session, a demonstration on turmeric processing was organized during which various stages of turmeric processing were shown to the participants. Hands on experience on various aspects on cinnamon harvesting including correct stage of harvesting, method to judge the sap flow condition, peeling and drying was gained by the trainees. A visit to Spices nursery in the Horticultural Plants Propagation Unit was made to showcase the diversified options of spices suitable for various areas. Various value-added products including essential oils, dehydrated powders etc. were shown to the participants and advantages of value addition were also described. Dr. Pooja Bohra, Scientist-SS, ICAR-CIARI explained about various value-added products developed by ICAR-CIARI and invited the stakeholders to establish such industries in the islands as no spices-based industries on value added products have so far been developed in the islands. Planting material of cinnamon, black pepper, woody pepper, lemon grass, long pepper, mango ginger and clove were distributed to the stakeholders. The programme was attended by 75 participants including farmers, entrepreneurs, island youth and students from JNRM, ANCOL and TGCE, who showed keen interest during the event. The event was conducted under the guidance of Dr. P.K. Singh, Head, Division of Horticulture and Crop Improvement and supervision of Dr. E.B. Chakurkar, Director, ICAR-CIARI

Plate 23 : Training on harvest and post-harvest management of spices

Kisan Mela on Natural Farming at CIARI gets underway

ICAR_CIARI, Port Blair along with its KVK has organized Kisan Mela on the theme: Promoting Natural Farming from 16th to 17th March 2023 in its Mela ground at Garacharma Research Complex. The basic objective was to provide an opportunity to the visiting farmers and other stakeholders to interact with the team of scientists and share the information to the larger audience on different facets of Natural farming. Speaking during the inaugural occasion the Chief Guest lauded the efforts of ICAR-CIARI in technology development and transfer in the field of Agriculture, Horticulture, Livestock and Fisheries for furthering the cause of Agriculture in the Islands. He exhorted each and every one present on the day to share the information learned at ICAR-CIARI amongst the other people so that an urge is felt in adoption of Know-how and do-how to the last strata of the farming community. He put forth the idea of having scientific interaction with the Department of Agriculture and Animal Husbandary in the line of Fisheries department to have a synergic effect of efforts. He stressed upon developing brand of A & N Islands so as to get a proper marketing platform. He also felicitated three farmers *viz.* Smti. Kausalya Mondal, Shri. Shrikanto Majhi & Smti. Kala Devi practicing natural farming and producing bio fertilizers at South Andaman. He also flagged-off the tableau on Natural Farming and inaugurated Modern Goat Unit established by the Division of Animal Science, ICAR-CIARI.

Ms Nandini Paliwal, IAS, Commissioner cum Secretary and Shri. B.S. Jaglan, IAS, Secretary, Animal Husbandry & Fisheries, A & N Administration were also present at the

occasion. More than 400 farmers from South, Middle & North Andaman are participating the event

Dr. E. B. Chakurkar, Director, ICAR-CIARI in his Presidential address expressed his happiness on the successful conduct of the Kisan Mela he also appreciated the farmer's participation in large number on both the days which speaks about the credibility of the technology transfer programme of the Institute. Further, he requested all the members of SHGs to be proactive in promotion of products for visibility at mainland. Shri. H. Manoj, General Manager, NABARD, Port Blair requested the farmers to reach NABARD for seeking help for formation of FPOs and establishing village level market. He also released extension bulletins, folders and pamphlets and gave away certificate to the participating SHGs, entrepreneurs and progressive farmers on the occasion. Quiz competition and Scientist-Farmers interaction was also conducted. More than 500 farmers participated.

Plate 24 : Kisan mela on natural farming

Plate 25 : Sale of quality planting materials of cinnamon

Frontline Demonstrations on Cinnamon Production in the Islands

Cultivation of true cinnamon has great potential in the Andaman and Nicobar Islands. Due to wider adaptability of the crop, it can be cultivated under open as well as an intercrop in the existing coconut and arecanut plantations. In order to promote scientific cinnamon cultivation and its postharvest handling, several efforts are being taken up at ICAR-Central Island Agricultural Research Institute, Port Blair under the Central Sector Scheme- Mission on Integrated Development of Horticulture (CSS-MIDH) Project on Spices. With the financial support from the Directorate of Spices and Arecanut Development, Kozhikode, Kerala, frontline demonstrations have been taken up at the farmers' fields in different parts of the islands. For selection of the beneficiaries, proposals were invited from the island stakeholders through media advertisements. Quality planting material of true cinnamon has been provided for commercial scale cultivation was provided to the farmers from South Andaman Island (Ograbraj, Bird Line, Prothrapur, Caddlegunj, Bambooflat, Wimberlygunj, Garacharma), Baratang Island, North and Middle Andaman Islands (Kalipur and Rangat) and Little Andaman Island (Harminder Bay). Further, considering the medicinal value of the spice, planting material was also provided to various stakeholders who participated in different training and awareness programmes conducted during the year. An awareness programme on Quality cinnamon production in the Andaman Islands was conducted on 24/03/2023 during which Dr. Ajit Arun Waman, Scientist-SS, ICAR-CIARI and Principal Investigator of the project guided various stakeholders on cinnamon cultivation in the Wimberlygunj, Bambooflat and Ograbraj villages in South Andaman. In time to come, these activities would help in boosting the quantum of cinnamon production from the islands.

Awareness Programme on Agromet Advisory Services & Extreme hot weather management in crops and livestock

An awareness programme was conducted at Bachra Pahad, Chouldhari under Gramin Krishi Mousam Seva (GKMS) on 23/03/2023 by ICAR-CIARI, Port Blair. GKMS provides Agro Advisory

Services to the Island farmers in English and Hindi and covers all the three districts of A& N Islands. GKMS unit of CIARI receives forecast from IMD at district and block level and prepares bulletin after getting advisories from expert members for three district and nine blocks in English as well as Hindi twice in a week. Experts from CIARI, Port Blair, PRI member of the ward and 30 farmers were participated in the awareness programme. Welcome address was given by Mr. Tapan Kumar Biswas, T.O., GKMS. Dr. T.Subarami, Sr. Scientist and PI, GKMS briefed about Agro Advisory services and discussed about management of prevailing extreme hot weather in different crops. The soil moisture stress managements and water conservation were discussed by Dr. Sirisha Admala, Scientist, ICAR-CIARI, Port Blair. Hot weather managements for livestock were discussed by Dr. Perumal, Sr. Scientist, ICAR-CIARI. During the programme Mr. Tapan Kumar Biswas, T.O., briefed about different apps developed under Ministry of Earth science *Viz.*, Meghdooth app and Damini app and informed the farmers about SMS services through mkisan portal, WhatsApp groups and YouTube video developed by GKMS, NRM-Division. The programme was concluded after discussion.

Plate 27 : Awareness Programme on Agromet Advisory Services

Plate 26 : Training on control of fly

Awareness on Control of flies to improve productivity and reproductive performance in livestock

A training programme was organized on "**Control of flies to improve productivity and reproductive performance in livestock**" by ICAR-Central Island Agricultural Research Institute, Port Blair at New Bimblitan, South Andaman on 23rd March, 2023 at New Bimblitan, with the theme Control of flies to improve productivity and reproductive performance in livestock.

Dr. D. Bhattacharya, Pr Scientist elucidated the major parasitic diseases of cattle and goats prevailing in the islands, their management and control measures to increase animal productivity. Dr. P.A. Bala detailed about the calcium supplementation to curb the effect of parasitism on livestock and optimize their production. Dr. Baljit Kaur, Senior Veterinary Officer, Department of Animal Husbandry & Veterinary Services addressed on scientific livestock rearing and coordinated the gathering harmoniously for successful completion of the training. Dr. P. Perumal stressed on cattle management and importance of indigenous herbs and calcium to reduce the losses incurring due to mal-management and parasitism. Demonstration on fly control ws also shown to farmers. The farmers were distributed with Calcium supplements (Phytocalcium-1 litre each) for their livestock. The occasion was graced by the village Ward member Mr. M. Kalaiselvam, who thanked the team of scientists and the Senior Veterinary Officer, for their efforts and urged to conduct such programmes frequently with much more inputs and knowledge to enlighten the villagers with modern livestock farming practices. Finally, the training culminated with the assurance that similar type of trainings will be conducted at this venue in near future on need and demand basis.

Exposure Visit for JNRM students to ICAR-CIARI conducted

An Educational trip was conducted for 80 students of B.Sc. Zoology and Allied Zoology

Plate 28 : Exposure visit of JNRM students

(B.Sc. Botany & Chemistry) of Jawaharlal Nehru Rajkeeya Maha Vidyalaya Port Blair along with 3 faculties to learn about the on the ongoing Fish based & Animal Science field activities at Garacharma Research Complex of ICAR-CIARI, Port Blair on 28th March 2023.Dr. K. Saravanan & Shri. J. Praveenraj, Scientists jointly dwelt in length on the freshwater ornamental fishes, freshwater carps, fish pond with its management, fish nutrition, health management, breeding and hatching hapa. Dr. P. A. Bala, Senior Scientist, Animal Science Division showcased and explained about the cattle farm, fodder block, goat, poultry and feed mill along with overall management of Animal Husbandary. The students expressed their happiness on the knowledge gained during exposure visit to ICAR-CIARI and interaction with the team of Scientists. They also showed interest in seeing the other research activities during the future visit.Earlier Dr. S.K. Zamir Ahmed, Principal Scientist & Head I/c Fisheries Science Division welcomed and introduced the Institute and its role in furthering agriculture in these Islands. Beside he stressed on to take advantage of their visit to the premier Institute and interact with Scientists to gain confidence and also build up an urge towards scientific temperament.

The visit was coordinated by the team, comprising of Dr. S. K. Zamir Ahmed, Principal Scientist & Head I/C FSD, Shri. D. Karunakaran, Scientist along with Smt. Asma Bibi Technical Assistant, Shri Ali Akbar Technician, Mr. Amit Roy & Mr. M. Saravanan under the plan & guidance of Dr. Eaknath B Chakurkar, Director, ICAR- CIARI, Port Blair.

Awards/ Honours

- Dr. Pooja Bohra served as a reviewer for the journals- Scientific Reports, National Academy Science Letters and Plant Physiology Reports (Springer- Nature)
- Dr. Pooja Bohra served as a judge for rangoli and bouquet making competitions held during the Flower Show organized by NABARD, Port Blair (26/02/2023)
- Dr. Ajit Arun Waman was appointed as Editor for the journal Vegetos- an International Journal of Plant Research (Springer-Nature) for the year 2023.
- Dr. Ajit Arun Waman served as a reviewer for the Journal of Applied Research on Medicinal and Aromatic Plants Research (Elsevier)
- I.Jaisankar, B. Augustine Jerard, R. Jaya Kumara Varadan and Dr.Y.Ramakrishna received appreciation letter from Chairperson Tribal Council, Kamorta for working in the Tribal area of Nicobar District.
- Dr. T. Subramani received best scientist award in Agronomy by Agro Environmental Developmental Society during the International Conference on Recent Advances in Agriculture, Animal Husbandry, Sciences & Technology for Sustainable Entrepreneurship (RAAAHSTSE-2023) held during 26-28 March, 2023 at Gwalior.

Trainings/ Meetings/ Interaction/ conducted

Training

Title	Course coordinator	Period	Venue	Male	Female	Total
Sea-based training on inducting new fishers into marine fishing	R. Kiruba Sankar, Y. Ramakrishna, K. Saravanan, J. Praveenraj, Sirisha Adamala, Mohammed Sarief	02nd to 04th Jan., 2023	Chukchuka, Car Nicobar	12	-	12
Scientific harvesting and postharvest management of spice	Ajit Arun Waman		ICAR-CIARI, Port Blair	-	-	75

Improved tuber crops cultivation – Regenerative agriculture practices for island based cropping system" under AICRP on tuber crops	B. A. Jerard, S.K. Zamir Ahmed, Y. RamaKrishna V.Damodaran, Manoj Kumar,	24th & 25th Jan., 2023	Pahalgaon, Dharmapur, North & Middle Andaman District	35	20	55
Demonstration cum training on mud crab fattening	K. Saravanan, J. Praveenraj, R. Kiruba Sankar	01st Feb., 2023	Hasmatabad, South Andaman	16	9	25
Potential of organic farming under Island based cropping system and input distribution	I. Jaisankar, B.A. Jerard , Y Rama Krishna, JK Varadan	07th to 11th Feb., 2023	Kakana, Pilpillow, Hitui and Chotta Enaka villages of Kamorta and Nancowrie group of Islands	148	78	226
Integrated Farming System for enhancing Farm income & Women empowerment	T.P Swarnam, Y Rama Krishna, T Subramani, Bommyasamy	8th - 10th Feb., 2023	ICAR- KVK, Sippighat	-	-	30
Livestock Management in IFS for doubling farmers income in A & N Islands	T.P Swarnam, P. Perumal, P. A Bala	16th to 18th Feb., 2023,	Gram Panchayat, Namunaghar	-	-	37
Mud crab culture and fattening	S.K. Zamir Ahmed, K. Saravanan, J. Praveenraj, R. Kiruba Sankar, D. Karunakaran, K. Ali Akbar	17th Feb., 2023	Indira Nagar, South Andaman	10	17	27
Coconut Handicrafts sponsored by Coconut Development Board	B. A. Jerard, S.K. Zamir Ahmed, Y. Rama Krishna, V. Damodaran, Pooja Kapoor, I. Jaisankar, Bommyasamy & Bijaya Kumar	06th to 13th March, 2023	KVK, Sippighat	0	15	15
High value vegetable cultivation under rainout shelter and organic input preparation	Dr. I. Jaisankar	08th – 10th March, 2023	Calicut _Village	-	-	25

Awareness Programme

Title	Course coordinator	Period	Venue	Male	Female	Total
National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)	K. Saravanan, J. Praveenraj, R. Kiruba Sankar	27thJan .,2023	Teylerabad, South Andaman	12	8	20
Scope of mud crab fattening in Andaman Islands	K. Saravanan, J. Praveenraj, R. Kiruba Sankar	30th Jan., 2023	New Wandoor, South Andaman	16	7	23

Responsible fishing practices	R. Kiruba Sankar, Y. Ramakrishna, K. Saravanan, Sirisha Adamala, Mohammed Sarief	05th Jan., 2023	Tribal Council, Car Nicobar	70	-	70
National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)	S.K. Zamir Ahmed, K. Saravanan, J. Praveenraj, R. Kiruba Sankar, D. Karunakaran, K. Ali Akbar	15th Feb., 2023	Guptapara, South Andaman	11	24	35
scope of mud crab culture and fattening in Andaman Islands	S.K. Zamir Ahmed, K. Saravanan, J. Praveenraj, R. Kiruba Sankar, D. Karunakaran, K. Ali Akbar	15th Feb., 2023	Guptapara, South Andaman	11	24	35

Publications

Asokan, H., Lele, N., Jaisankar, I., Jerard, B.A. & Velmurugan, A. (2022). Leaf pigments and epicuticular wax content variation of selected mangrove species in Andaman Islands, India (2022). Journal Andaman Science Association, 27(2): 147-155. **(NAAS: 4.15).**

Bhowmick, S., Pal, S., Sunder, J., Sujatha, T., De, A.K., Mondal, T., Singh, A.D., Joardar, S.N., Batabyal, K., Dutta, T.K., Bandyopadhyay, S., Tiwari, A. & Samanta, I. (2023) Exploring broilers and native fowls of Andaman and Nicobar Islands as a source of b-lactamase-producing Enterobacteriaceae even with limited anthropogenic activities and docking-based identification of catalytic domains in novel b-lactamase variants. Frontier in Veterinary Science, 9:1075133. doi: 10.3389/fvets.2022.1075133.**(NAAS : 9.47)**

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Karanjalker, G.R., Karanjalker, A.G. & Waman, A.A. (2023). Essential oil profile of dried fruit pericarp of *Zanthoxylum rhetsa* (roxb.) DC: a traditional spice from Goa, India. *Vegetos*. https://doi.org/10.1007/s42535-023-00584 **(NAAS rating: 5.27).**

Kiruba-Sankar, R, Harsha Haridas, Pandey, SK, George, Z, Saravanan, K, Gladston, Y, Praveenraj, J, Ajina SM (2023). The Nicobarese tribes and their coastal fishing activities during the COVID-19 pandemic-related restrictions-preliminary findings. *Journal of Coastal Conservation,* Springer. https://doi.org/10.1007/s11852-023-00942-2 **(NAAS rating- 8.1).**

Kiruba-Sankar, R., Saravanan, K., Sirisha Adamala, KesavanSelvam, Lohith Kumar, Praveenraj, J., (2023). First report of marine debris in Car Nicobar, a remote oceanic Island in the Nicobar archipelago, Bay of Bengal. *Regional Studies in Marine Sciences*. https://doi.org/10.1016/j.rsma.2023.102845 **(NAAS rating- 8.16).**

Perumal, P., Sunder, J., De, A.K., Alyethodi, R.R., Vikram, R., Upadhyay, V.R., Mayuri, S.C. & Bhattacharya, D. (2023). Flaxseed oil modulates testicular biometrics, hormone, libido, antioxidant and semen profiles in endangered Teressa goat of Andaman and Nicobar Islands. Reproductive Biology, https://doi.org/10.1016/j.repbio.2023.100730. **(NAAS rating : 8.09)**

Sawhney, S., Bhattacharya, D., Perumal, P., Sunder, J., Sujatha, T., Mondal, S., Chakurkar, E.B. & De, A.K. (2023). Control of iron deficiency anaemia in piglets through 2-7-10-15 module of oral iron supplementation. Exploratory Animal & Medical Research, 12(2) :187-194.**(NAAS rating : 5.85)**

Sujatha, T., Mondal, S., De, A.K., Perumal, P., Sawhney, S., Bala, P.A., Sunder, J., Praveenraj, J., Bhattacharya, D. & Chakurkar, E.B. (2023). First recorded outbreak of Paramphistomum cervi in Andaman local goats (Capra aegagrus

hircus) from Bay island of India: A brief communication. Indian Journal of Animal Sciences, 93 (1): 29–32.**(NAAS rating : 6.29)**

Waman A.A., Pooja Bohra and Karthika Devi R. (2023) Serpentine layering as an efficient means of propagation in woody pepper (*Piper pendulispicum* C. DC.): A novel spice from Andaman Islands. *National Academy Science Letters*, https://doi.org/10.1007/s40009-023-01239-6 **(NAAS rating: 6.65).**

De AK, Chakraborty D, Ponraj P, Sawhney S, Banik S, Chakurkar EB and Bhattacharya D (2023) Supplementing turmeric rhizome powder in growing Andaman Local Pigs: A conflated approach for therapy evaluation. Tropical Animal Health and Production, 55:45. https://doi.org/10.1007/s11250-023-03459-w **(NAAS rating: 10.14).**

De AK, Sawhney S, Sunder J, Muthiyan R, Ponraj P, Sujatha T, Malakar D, Mondal S, Bera AK, Kumar A, Chakurkar EB and Bhattacharya D (2023) Peeping into mitochondrial diversity of Andaman goats: unveils possibility of maritime transport with diversified geographic signaling. Genes, 14, 784. https://doi.org/10.3390/genes14040784. **(NAAS rating: 7.89).**

Kumar A, Rao B and De AK (2023) Islands of Milk Insecurity in World's Leading Milk Producer: A Case of Andaman and Nicobar Islands, India. Sustainability, 15, 206. https://doi.org/10.3390/su15010206. **(NAAS rating: 9.89).**

Popular Article

Waman A.A. (2022) Promoting Indian Bay leaf in the Andaman Islands through quality planting material. *Indian Journal of Arecanut, Spices and Medicinal Plants*, 24(3): In press.

Gene bank accession numbers:

- Augustine Jerard, B, I.Jaisankar and K. Pradheep, (2023). IC number (0647723) for Wild Okra (*Abelmoschus caillei) f*rom ICAR-NBPGR, New Delhi.
- B. Augustine Jerard, I. Jaisankar, V. Damodaran, L. B. Singh and S.K. Zamir Ahmed (2023). IC number 0647385 for *Hibiscus sabdariffa* obtained from ICAR-NBPGR, new Delhi.

Registration number

- Jaisankar, I., D.R. Singh, Shrawan Singh and B. Augustine Jerard (2022). ICAR-NBPGR plant Germplasm Registration number ***INGR22093*** for *Morinda citrifolia* [CIARI Samridhi (TRA-1)]

Swachh Bharat Abhiyan

Cleaning of office, beach cleaning, farm, quarter under Swachhata movement on 17/01/2023 was done. The scientific, technical and contractual staff of the station actively participated in the drive. The team sensitized the people in the area on good citizen science practices to be followed and to spread the message of clean and green India. Also aim to spread the message to work towards a plastic-free, litter-free and pollution-free towards sustainable environment

Beach clean-up drives organized at Car Nicobar Island

A series of beach cleanup drives were taken up on the beaches of Big Lapathy, Tamaloo, Malacca Jetty, Sawaii, and Kimos Bay in Car Nicobar from 31st Jan to 20th February, 2023 at regular intervals. The focus of the cleanliness drive is to spread awareness among the traditional people of Car Nicobar about the ill effe cts of plastic waste accumulated in the coastal areas. Accordingly, the volunteers from the tribal community were sensitized and gathered from the villages of Malacca and Perka to undertake the cleanup activities and participated in the removal of the plastic waste on the beaches. The activities were undertaken through the collaborative project titled 'Augmenting livelihood, resilience, and knowledge generation through coastal fisheries information hub for Car Nicobar Island' between ICAR-Central

Plate 29 :Beach clean-up drives

Island Agricultural Research Institute (CIARI), Port Blair, and the Department of Science and Technology (DST), New Delhi. The cleanup activities would henceforth be continued in the future and more volunteers from different villages would be encouraged to participate in the beach clean-up activities. The beach clean-up was closely coordinated by ICAR-CIARI and Krishi Vigyan Kendra (KVK), Car Nicobar under the guidance of Dr. Eaknath B. Chakurkar, the Director, ICAR-CIARI, Port Blair.

Schedule Tribe Component

Programme	No	No of beneficiaries
Training	5	594
Demonstration	2	85
Input distribution	Cuttings = 4500 Seed = 10kg Farm implements = 650 Liquid fertilizers = 81 q	480

Participation in national seminars/ symposia/ conferences/ workshop

Name	Programme	Date/Venue/Organizer
S.K. Zamir Ahmed	Attended online meeting on topic: Meeting of all executive & editorial; board members of SEE organized by Society of extension education, Agra.	12th Jan., 2023
T.P.Swarnam	7th Biennial Workshop of AICRP on IFS	18th -21st Jan.,2023, Rahuri
Dr Jai Sunder	30th Annual conference of IAAVR	03rd - 04th Feb 2023 at Kamdhenu University, Anand
B Augustine Jerard	Chaired the Executive Committee meeting of Indian Society for Plantation Crops	30th January and 28th February 2023 – Online by ISPC, ICAR-CPCRI, Kasaragod
K. Saravanan and J. Praveenraj	Attended the project review meeting of National Surveillance Programme for Aquatic Animal Diseases (second phase)	Conducted on 23rd Jan., 2023 by Department of Fisheries, Government of India
S.K. Zamir Ahmed	Attended online meeting on topic: Meeting of all executive & editorial; board members of SEE organized by Society of extension education, Agra	02nd Feb., 2023
Scientist ICAR-CIARI	Attended Regional workshop on topic" Strengthening Medicinal Plant sector in Andaman & Nicobar Islands.	16th Feb 2023 organized by RFCSR, KFRI, ANMPB, CIARI, Department of Agriculture & Department of AYUSH & Department of Forest, A & N Islands.
J. Praveenraj	Workshop on "Innovative Technologies in Support of a Safe and Sustainable Aquatic Food Supply (One Health Aquaculture Framework)"	20th to 22nd Feb., 2023 held at Kochi during which was jointly organised by ICAR-CMFRI, Kochi and CEFAS, UK.
T.P.Swarnam	15th Annual Workshop of the central sector scheme, "Monitoring of Pesticide Residues at National Level"	23rd February, 2023, ICAR- IARI, New Delhi
Dr. Jai Sunder	Annual review meeting of DBT Biotech Kisan Hub	21th March, 2023, Online

J. Praveenraj	Launch Workshop and Sensitization Programme on National Surveillance Programme for Aquatic Animal Diseases which was inaugurated by the Honourable Minister of Fisheries, Animal Husbandry and Dairying, Government of India.	Phase-II at Chennai during 27th to 28th Feb., 2023
T.Subramani	International conference on "Recent Advances in Agriculture, Animal Husbandry, Sciences & Technology for Sustainable Entrepreneurship"	26th -28th March, 2023 at Gwalior
K. Saravanan	Attended the project review meeting of National Surveillance Programme for Aquatic Animal Diseases project which was chaired by the Secretary, Department of Fisheries, Government of India.	27th March, 2023
K. Saravanan and Dr. J. Praveenraj	Attended the review meeting of National Surveillance programme for Aquatic Animal Diseases, Phase- II at Chennai and presented the research progress which was chaired by the DDG (Fisheries Science).	01st March, 2023 at ICAR-CIBA, Chennai

Appointments/ promotion/ transfer/ retirement/ obituary

Promotion

Shri T.A. Kumar Tirkey, Technician (T-1) on 23.02.2023 (FN) from SSS.

Transfer

Dr. R. Jaya Kumaravaradan, Scientist to ICAR-CICR, Nagpur from this Institute on 31.03.2023 (Afternoon).

Retirement

- Shri Krishna Roy, SSS (on 31.01.2023)
- Shri M. Selvaraju, SSS (on 28.02.203)
- Smt. Gynam, SSS (on 31.03.2023)
- Dr. S. Murugesan, ACTO (on 31.03.2023) VRS.

Other information:

Technical Assistance from ICAR-CIARI helps Andaman Administration to get its First Commercial Scale Plant Tissue Culture Laboratory

Quality planting material is the key step in improving the productivity of agri- horticultural commodities and micropropagation has been considered as a viable option to produce quality propagules in large numbers. However, so far the Andaman and Nicobar Islands largely depended on mainland supplies for micro-propagules of commercial crops. To reduce the dependency of island agriculture, Department of Agriculture, UT Administration took initiative to establish a commercial scale plant tissue culture laboratory at its Sippighat farm. ICAR-CIARI, Port Blair was approached for providing the technical guidance to bring the laboratory to reality. Dr. Ajit Arun Waman, Scientist-SS (SPMA), ICAR-CIARI was nominated as the Member of Core Committee, who provided the technical guidance and real-time ground support under the supervision of Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI for developing this state of the art facility in these remotely located islands.

The laboratory was inaugurated on February 9, 2023 by Shri. Pankaj Kumar, IAS, Secretary (Agri.), Andaman and Nicobar Administration in the presence of Dr. Chakurkar, Shri. Radhe Shyam Meena, DANICS, Director (Agri.), Smt. Champa Das, Pramukh, Panchayat Samiti, Prothrapur, Dr. P.K. Singh, Head (I/c), Division of Horticulture and Crop Improvement, ICAR-CIARI, invitees from developmental departments and farmers. The facility would focus on producing quality planting material of banana, pineapple, orchids and other horticultural commodities to meet the demand of island farmers.

Plate 30 :ICAR-CIARI assist A & N Admn. to get first laboratory

- An area of about 0.5 ha land was developed after removing oil palm trees and with different soil conservation measures such as contour terraces, bunds, half-moon bunds, trenches, pond (3 m x 3 m x 1 m) to arrest the runoff and soil loss at organic coconut farming site of Garacharma farm.

Support for Natural farming activities (Dr B. A Jerard and Dr V Damodaran)

- Crops and varieties suitable for natural farming under island conditions such as Coconut, arecanut, Elephant Foot yam, Greater Yam, Colocasia, sweet potato, leafy vegetables, passion fruit, ginger, turmeric, tapioca, bread fruit were highlighted and the specimen were exhibited in the Kisan Mela held at ICAR-CIARI, Port Blair during 16-17th March 2023 in which over 400 people participated and learnt about the natural farming practices. The climate resilience nature, better performance over marginal management conditions, ease of marketing of produce, preference among the local people were highlighted to the visiting farmers.

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