ISLAND AGRICULTURE
ICAR-CIARI NEWSLETTER

ICAR-CENTRAL ISLAND AGRICULTURAL RESEARCH INSTITUTE
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Andaman and Nicobar Islands, India

Vol. XIV. No.3 **July to September, 2021**

From Director's Desk …

The third quarter of the year 2021 has witnessed very significant achievements and important events. Scientists of the institute have done exploratory survey in the North and Middle Andaman and have collected some of the unique germplasm of Pandanus, Passion fruit, Cissus sp, honey bee repellant plant etc. A new terrestrial orchid species Eulophia spectabilis was collected from forests of South Andaman and conserved. Experiment on organic farming in brinjal showed that highest yield was recorded by using neem cake followed by goat manure and rice straw+ sea weed manure. Phytochemical profiling of fruit peel of endemic Garcinia dhanikhariensis showed the potential of this endemic species as a novel natural colourant. For the first time an ascaridoid nematode, Hysterothylacium sp. is reported from the Notched thread fin bream, Nemipterus pernonii from the Andaman Islands. A vertical re-circulatory mud crab fattening unit and Indoor biofloc unit for rearing of finfishes and shellfishes have been established at Marine Research Laboratory. A real time marine fish catches system mobile app "A&N Fish" has been developed by our scientist for the benefit of the research and development. For the first time our scientists have reported the confirmed incidence of Paramphistomum cervi from a goat herd of South Andaman. Our institute has been doing significant work on characterization of indigenous animal and poultry germplasm. Molecular characterization (maternal lineage) of Andaman goat revealed that Andaman goat formed a separate cluster and was phylogenetically close to Black Bengal goat breed.This institute celebrated 93rd foundation day of ICAR by planting more than 600 tress under the banner of "har med par ped". The Chief Secretary, A & N Administration, Shri. Jitendra Narain, IAS visited ICAR-CIARI, Port Blair on 7th August 2021 and lauded the efforts of the scientists and suggested to develop the World Coconut Germplasm centre as the Agro-Eco-Tourism point. Along with rest of the country, we celebrated the 75th Independence Day. Under the Bharat ka Amrut Mahotsav our scientists have conducted number of field days, demonstration, webinar, doordarshan interview, interactive meetings and training on various aspects of agri/horti/animal/fish sectors for the benefit of the farmers throughout the A & N Islands. A significant number of publications viz. research papers, popular article, extension bulletin, etc. have been published by our scientists.

This period has also witnessed the first ever commercialization of ***"Dweep HanGreens" technology to one of the island entrepreneur.*** *I congratulate the scientists involved in developing the technology and wish to have more technologies in the near future. I am glad to present this quarterly Newsletter of our institutes research, development and extension activities and congratulate all the contributors for this documentation. I take this opportunity to thank all the officials of SMD for support and all the staff members of our institute for their commendable work and contribution for overall progress and development of the institute.*

RESEARCH HIGHLIGHTS

Cluster bearing noni accession (JASS 65)

Regular month wise fruit yield was recorded from the cluster bearing noni accession identified from noni plantation maintained at Garacharma Research Farm of the ICAR- CIARI. The average fruit yield of 2.86 kg/tree/month and mean single fruit weight of 297 g was recorded from the tree. The recovery of the fruit seed(10.77%), pulp(94.90%) and fruit pulp(69.96%) were recorded.

Plate 1: Cluster bearing noni accession

Andaman Padauk: long term evaluation

Padauk seedlings produced from various accessions were planted into the main field for its long term growth and establishment study. Around 650 number seedlings in an area of 6000 m^2 were planted with the spacing of 3m x 3m. The initial observations on growth of padauk seedlings revealed that there is no significant difference in height and color diameter among the accessions, however, the highest value of 160.8 cm height was recorded in Pembroke Bay accession and the highest value of 1.98 cm color diameter was recorded in Kalapahad 28 accession. The highest number of branches (5.6) was recorded in Katchal accession followed by Ranghat II accession (4.8).

Plate 2: Padauk seedlings

Collection and conservation of *Pandanus* species

A total of 5 *Pandanus odorifer* and seven *Pandanus ectorius* were collected from different locations of South, North and Middle Andaman districts. The average fruit weight of *P. odorifer* ranged from 1.75 kg to 3.75 kg with reddish orange colour while the mean fruit weight of 0.3 kg to 1.8 kg with yellowish orange colour recorded in *P. tectorius*. The *Pandanus lerum* accession collected from Car Nicobar recorded 13 kg fruit weight with orange pink colour fruit the same species collected from Garacharma recorded 8.3 kg fruit weight with yellow fruit colour. The phytochemical and proximate analysis is in progress.

Plate 3:Fruits of *P. odorifer* and *P.lerum*

Enriching coconut plantations

The growth observations recorded on the multipurpose trees planted in coconut garden showed more height (5.60 m) in *Sesbania grandiflora* while the highest diameter at breast height level (7.5 cm) was recorded in *Callophyllum inophyllum.* The first flowering and fruiting was observed from the Andaman Green Dwarf coconuts planted in between *Sesbania grandiflora, Leuceana leucocephala a*nd *Bauhinia spp.* The soil analysis results revealed that the multipurpose trees influenced the soil nutrient significantly. The maximum soil nutrients of N (3.5g /Kg), P (1.2 g /Kg), K (0.7 g /Kg) and OC (1.72%) was recorded under the *Sesbania grandiflora* followed by *Leuceana leucocephala* trees. The maximum green biomass of 5.8 kg/tree was recorded in *Dendrolobium umbellatum (L.)* followed by *Sesbania grandiflora* (4.25 kg/tree) and 4.05 kg in *Bahuinia* spp. Based on the observations the following species were identified to enrich the coconut plantations for green biomass production (*Dendrolobiumum bellatum*), soil nutrient enrichment (*Sesbania grandiflora, Leucaena leucocephala),* wind break (*Callophyllum inophyllum*) and staking (*Bahuinia spp, Casuarina equisetifolia).*

Plate 4: Intercropping of multipurpose trees in coconut plantation

Germplasm collection & characterization

Passion fruit: One passion fruit (accession no. JZJLDJ 01) was collected and conserved at CIARI Garacharma research farm having violet peel with medium sized fruits. The fruit morphological observations revealed that the average single fruit weight was 60 g, percentage of seed was 27.25 and fruit juice recovery percentage was 36. The passport data has been submitted to the ICAR-NBPGR, New Delhi for obtaining IC number.

Plate 5: Cross section of passion fruit accession

Cissus repens : A traditional leafy vegetable accession (AJ 66) was identified and seed/cuttings were collected for its multiplication and further evaluation.

Plate 6: Cissusrepens leaf and fruits

Macaranga nicobarica (IC number 626370): Leaf morphological characters were recorded in comparison with *M. indica* and *M. tanarius*. The highest leaf length (96 cm), leaf width (71 cm), petiole length (78 cm), and length of mid rib vein (75 cm) was recorded in *M. nicobarica* followed by *M. indica* (49 cm, 40 cm, 57 cm, and 37 cm respectively) and the least leaf length (25 cm), Leaf width (19 cm), petiole length (22 cm), and length of mid rib vein (20.3 cm) was recorded in *M. tanarius*.

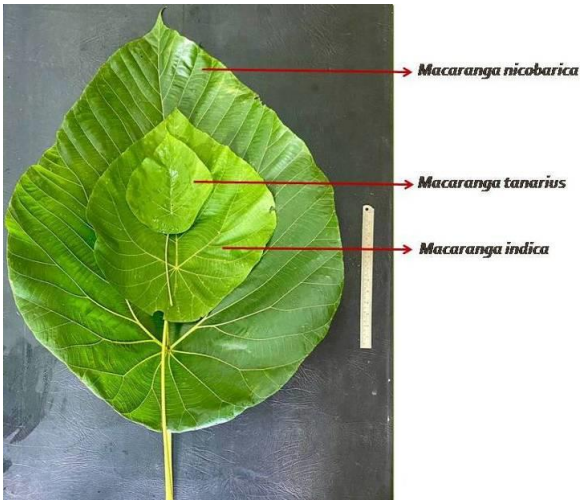


Plate 7: *Macaranga nicobarica*

Flowering and fruiting in honeybee repellent plant

An accession of 'Honey bee repellent plant' or 'Malay cardamom' *Amomum aculeatum*, belong to the family *Zingiberaceae*, collected and conserved at the institute has flowered and fruited. The flower and fruit characteristics were documented for further exploitation. It is reported and known that the Andaman aborigines use leaf juice of *A. aculeatum* for tranquilizing the giant rock bees while harvesting honey from beehives. The fruit rind is dark purple, pulp is creamy white, sweet. Fruits are 15 to 32 mm long, 12 to 22mm wide. The number of seeds ranged from 12 to 18 per fruit.

Plate 8 :Flowering and fruiting in honeybee repellent plant

Collection and conservation of a new orchid species

A new orchid species *Eulophia spectabilis* was collected from forests of South Andaman and conserved. It is a terrestrial orchid growing to a height of 30-65 cm. The pseudobulb grows beneath the ground and is sub globose in shape. The leaves are oblong to lanceolate and 2-3 in number. The flowers are borne on racemose inflorescence which bears upto 15 flowers. The inflorescence originates from the base of the leaves. Flower colour is light yellow. Flowering season was observed to be July-October in Andaman and Nicobar Islands. This orchid is highly suitable for exploitation as cut flower.

on on fruit set in

Plate 9 : New orchid species

Hand Pollination in Dragon Fruit :

Hand pollination was standardized in dragon fruit with same genotype, hand pollination in cross combinations and natural pollination as control. Hand pollination at 8.30 PM to 9.30 PM on the day of anthesis was suitable for Andaman conditions for maximum fruit set. Among the different pollination treatments, fruit set was high in cross combinations when compared with pollination by the same genotype. Maximum fruit set (100%) was observed in the cross combination of DGF 4 (Dark purple pulp) x DGF 2 (pink pulp), whereas minimum was recorded in natural pollination (24.2%).

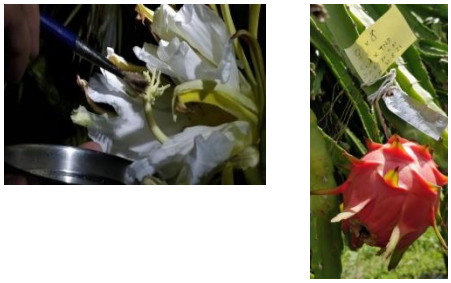


Plate 10: Hand pollination in dragon fruit

AICRP Vegetable crop trial

Brinjal Long (AVT-I, AVT-II and IET), Brinjal round (AVT-II, IET), Brinjal hybrid long (AVT-I and IET,), Brinjal hybrid round (AVT-1 and IET-I), Brinjal small round (AVT-II) and Tomato Determinate (AVT-I, AVT-II and IET), Tomato Indeterminate (AVT-I), Tomato ToCLV hybrid (IET), Tomato hybrid Determinate (AVT-II and IET-I) and Cherry Tomato (AVT-I) trial entries nursery were made and planted in the field to evaluate the growth and yield under Island condition.

Plate 11: AICRP Vegetable crop trial

Effect of substrates and foliar nutrition on Burmese coriander in Dweep Pro Dhaniya system

Studies on effect of substrates and foliar nutrition on growth, yield and quality of Burmese coriander grown under Dweep Pro Dhaniya system were conducted. Superior herb yield and photosynthetic pigment accumulation were observed, when vermicompost and soil (1:1, v/v) was used as a substrate. Treatment combination with vermicompost and soil (1:2, v/v) as substrate exhibited higher content of ascorbic acid and total carotenoids. Foliar application of urea (0.1%) at fortnightly interval supported plant growth, yield and quality parameters.

Phytochemical profiling of fruit peel of endemic *Garcinia dhanikhariensis*

In a pioneering attempt, biochemical analysis of peel of Andaman Kokum (*Garcinia dhanikhariensis*) was conducted using Liquid Chromatography- Mass Spectroscopy. Results suggested potential of this endemic species as a novel natural colourant. Cyanidin was identified as the dominant anthocyanin. Phenolic acid profiling of its two distinct collections revealed variations in terms of presence of phenolic compounds. *P*-Coumaric acid and Gentisic acid were found to be dominant constituents. Peel was also found to be a

novel source of pharmaceutically valuable hydroxycitric acid.

Phytochemical analysis of Tisal (*Zanthoxylum rhetsa*) collections

Biochemical analysis was carried out in tisal (*Zanthoxylum rhetsa*), which is a minor spice traditionally used in Goa, under a collaborative project. Essential oil contenting the dried peel of tisal varied between 6.0 and 8.4% among seven collections, while oleoresin content varied from 8.86 to 12.22%.Phenolic acid profiling using LC-MS revealed dominance of Ferulic acid in the dehydrated fruit peel, which is the economic part of the plant.

Effect of organic nutrient application on growth and yield of Brinjal

A field experiment was conducted to study the effect of different organics *viz*., poultry manure, rice straw + seaweed compost, cow dung, goat manure and neem cake on growth and yield of brinjal (Var. CARI brinjal 2) in RBD with 3 replications. The organics were applied at the rate of 1kg per plant at two intervals 250g/plant at the time of transplanting and 750g/plant at the time of first flowering. The results indicated differential and significant effect of organics on the growth and yield of brinjal. The rice straw+seaweed compost (1225g/plant, 34t/ha) recorded on par yield with goat manure (1345g/plant, 37t/ha) and neem cake (1375g/plant, 38t/ha), while lowest yield was recorded in cow dung (1015g/plant, 28t/ha) and poultry manure (1065g/plant, 29.5t/ha). However, rice straw+seaweed compost significantly increased the root biomass and length than other treatments.

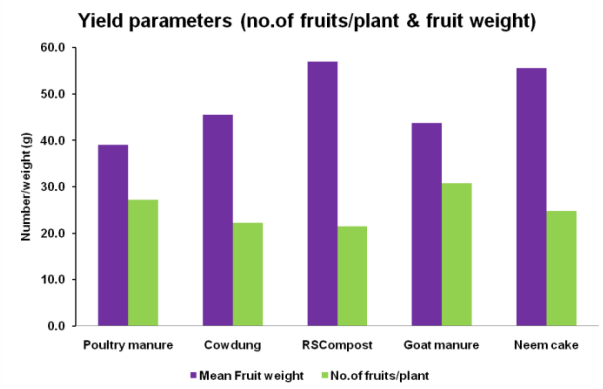


Plate 12: Effect of different organics on brinjal growth

MT1-Poultry manure; MT2-Cowdung; MT3-Rice straw + seaweed compost; MT4-Goat manure; MT5-Neem cake

Sea weed liquid fertilizers

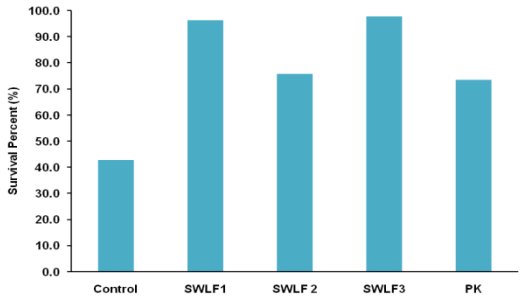
Preparations and shelf life

An attempt was made to prepare sea weed liquid fertilizer (SWLF) from brown seaweed species *Padina gymnospora* using different ingredients by fermentation method. The microbial growth increased up to 15- 21 days after inoculation and then steady reduction in microbial load was observed after 3 weeks of fermentation in all the methods. Upto 5 months of storage the microbial load was found to be 25 – 30 x 10^7 cfu/ml, pH ranged from 6.5 – 6.8, with good flow which is within the permissible limits of FCO standards for direct application.

Effect on rooting in black pepper

The 1% SWLF was applied to black pepper cuttings as dipping for 3hrs and 20ml soil drench for 3 times at 15days interval upto 45 days. The results indicated significant root development and establishment in SWLF treatment cuttings followed by Panchakavya than control. This indicated their potential use as rooting and plant growth stimulant.

Plate 13: Effect of treatments on rooting of Black pepper cuttings



Aquatic disease surveillance and monitoring

To analyze the attitude and perception of stakeholders on the aspects of fish health management in Andaman and Nicobar Islands, responses were collected and compiled from a total of 305 fish farmers covering North and Middle Andaman, South Andaman and Nicobar districts by using questionnaire. A total of 285 numbers of baseline data of freshwater fish farms collected from Andaman and Nicobar Islands were uploaded in the National Database on Aquatic Animal Diseases.

Parasitic surveillance on finfishes

An ascaridoid nematode, *Hysterothylacium* spp. is reported from the Notched thread fin bream, *Nemipterus pernonii* for the first time from the Andaman Islands. A total of 4 individuals were recovered from the gill flap in *N. peronei.* The parasites were found encysted under the skin in the under surface of the gill operculum.

Plate 14: *Hysterothylacium sp*

Recirculatory unit for Mud crab fattening

A vertical re-circulatory mud crab fattening unit setup at Marine research laboratory and was stocked with 106 nos of mud crab (*Scylla serrata*). The water crabs were stocked in plastic trays with lid and the trays were interconnected with water circulation which was provided at required times. The crabs were measuring from 10.5 cm to 21.0 cm (carapace length) and weighing (0.18 kg to 1.89 kg) and were fed with trash fishes three times a day.

Model on Indoor biofloc unit

An indoor circular biofloc unit (4m dia)was constructed at marine research laboratory for rearing of finfish and shellfishes under biofloc systems in indoor controlled conditions. The unit was constructed with a water holding capacity of 3000 litres.

Mobile Application for real-time marine fish catches system for Andaman and Nicobar Islands (A&NFish)

Marine fishery sector of Andaman and Nicobar Islands is complex and diverse due to the multispecies nature of fishery and the remotely scattered fish landing points. In order to bridge the gap in obtaining useful fish catch data, mobile App named 'A&NFish' was developed to systematically record real time marine fish catch data from 51 landing centre from three districts of Andaman and Nicobar Islands. User authentication login page was developed to allow registered users to login to the site and update catch data. The app has the ability to collect species-wise daily total catches

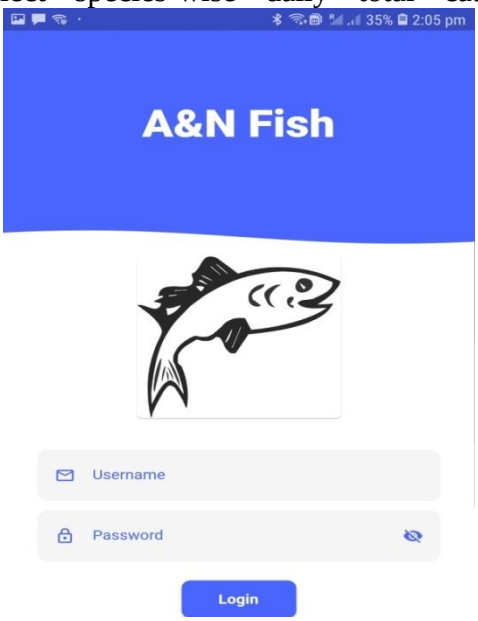


Plate 15: Mobile Application for real-time marine fish catches system

landed at landing centre. It is specifically designed with a purpose to garner the data from different parts of the Islands for the benefit of research and development. The app is integrated with web server and MySql database server to store and retrieve data in real time. The information contains landing pattern of Sharks, Seaweed Diversity of Andaman, Aquaculture of Marine Fishes, Stock Assessment of Tuna, Inland Aquatic Biodiversity, Breeding of Ornamental Fishes, PFZ Advisories, Mariculture of Marine Fishes, Marine Faunal Biodiversity, Open Sea Cage Farming etc.

First Report: Amphistomiasis immature in organized goat herd: A first recorded incidence of *Paramphistomum cervi* from Andaman & Nicobar Islands

T. Sujatha, Perumal P., Arun Kumar De, Jai Sunder, P.A. Bala, R.R. Alyethodi and D. Bhattacharya

Outbreak of immature amphistomiasis in goats has not been reported so far from Andaman & Nicobar Islands on the basis of isolation of causative agents albeit, previous reports suggest the occurrence of mature amphistomiasis based on coprological examination (Sunder *et al*., 2005, 2020). But adult flukes capable of producing eggs are harmless (Brown, 2005). Therefore, finding eggs in the faecal sample in ruminants may be taken as a biomarker for delineating endemic or hyper-endemic zones of amphistomiasis but is not suitable for detecting the clinical cases of the disease, since immature flukes are only capable of producing the disease. We therefore, report first time an outbreak of immature amphistomiasis along with it's etiological agent in an organized goat farm situated in Mithakhari of South Andaman District during September, 2021. The animals were reared in semi intensive system since they were regularly allowed to graze in the nearby water logged marshy land since the climate was wet throughout this month and there was 8.6 inches rainfall over 23 days. From the middle of the month, the farmer reported mortality of the goats (average 2-3 per day) showing the symptoms of abdominal pain, bloat/distension of abdomen, abnormal accumulation of clear

oedema fluid under the skin of the lower jaw (bottle jaw), profuse watery diarrhoea followed by death. Within 14 days, the mortality reached to 38.46%. After visiting the place of outbreak post-mortem examination of the goats was done. Examination of abdomen revealed accumulation of colourless fluid in the peritoneal cavity and there was distension of gall bladder. After opening the intestine, in the duodenum region numerous immature flukes could be detected along with patches of hemorrhages as they were embedded in the mucosa and are reported to be plug feeders by drawing pieces of mucosa in the suckers. In the abomasum there were ulcerative changes along with presence of few numbers of fluke. Ultimately numerous worms were isolated from rumen of the affected animal. On the basis of colour and microscopic examination the worms were indistinguishable from *Paramphistomum cervi* since the light adult specimen was light red, which were pear-shaped, slightly concave ventrally and converse dorsally, with a large posterior sub terminal sucker. Based on the post-mortem findings and clinical symptoms, the farmer was advised to start with treatment against amphistomiasis by using single dose of oxyclonazide along with supportive iron therapy for consecutive five days and further advised to be stall fed. After onset of the therapy only three severely affected animals died within two days and after five days no mortality was observed.

Plate 16: Photomicrograph of pear-shaped *Paramphistomum cervi* , slightly concave ventrally and converse dorsally, with a large posterior sub terminal sucker (X40)

Plate 17 : Ulcerative lesion of duodenum of affected goat

Plate 18 : Ulcerative lesion of abomasum of affected goat

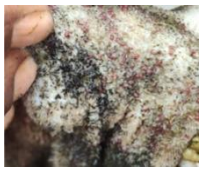


Plate 19: Numerous light red coloured worms in the rumen of infected goat

Molecular characterization (maternal lineage) of Andaman goat

Maternal lineage of Andaman goat (ALG) was investigated using mitochondrial DNA (mtDNA) control region (D-loop) sequence. Sequence information of complete D-loop of Andaman goat was generated for 17 goats and the sequences were submitted to GenBank with accession numbers MT747101 to MT747117. To understand the phylogenetic relationship of ALG with other Indian goat breeds, complete/partial sequences of mtDNA D-loop of different registered Indian goat breeds were retrieved from public database (NCBI). The evolutionary history was inferred using the Neighbor-Joining method with 1000 bootstrap applications. The phylogenetic tree revealed that ALG formed a separate cluster and was phylogenetically close to Black Bengal goat breed.

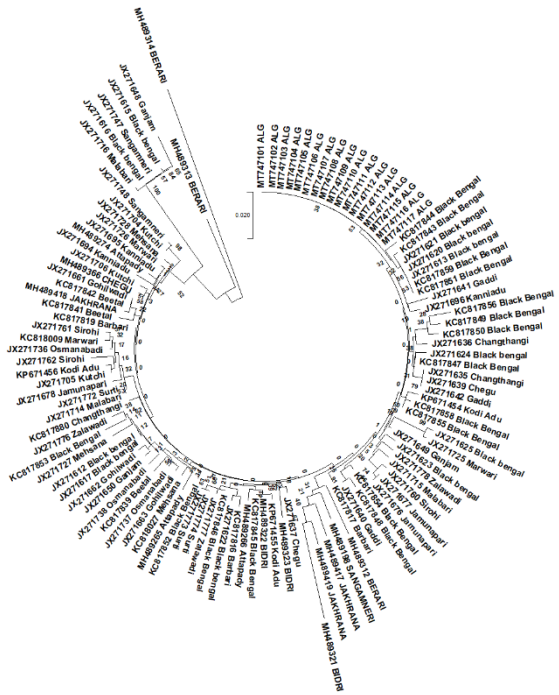


Plate 20 : Phylogenetic tree showing AG forming a separate cluster

Success Stories

A woman farmer cum entrepreneur: organic vegetable production and strategic marketing

A woman farmer cum entrepreneur Mrs. Sridevi, a Computer Science graduate owns her land at Baednabad, South Andaman. Technical guidance and inputs were given to her and she started growing different vegetables crops like cucurbits, beans, greens, bhendi and solanaceous vegetables in an area of 01 acre using organic inputs. Now she is harvesting 15 -20 kg of vegetables everyday and she has adapted an innovative strategy for marketing her organic vegetable produce through online whatsapp group to vegetable vendors at Port Blair. She sells her organic produce within 6 hours of harvest and she earns about Rs 1500/- per day (net income). The woman entrepreneur has also initiated production of ornamentals, medicinal plants and vegetable seedlings.

Plate 21: Woman farmer cum entrepreneur

Income generation by value addition in cut flowers: Success story of SHG members

ICAR-CIARI in collaboration with NABARD, Port Blair organized 13 days training to two different self-help groups at Teylerabad and Garacharma. In this training programme, various aspects of flower cultivation and value addition techniques were taught to them by hands on practice.

Out of interest, one SHG initiated cultivation of speciality flowers at Teylerabad with the help of ICAR-CIARI and fund support by NABARD. Four women from each self-help group were highly motivated by the training programme and were creative to prepare different value-added products from flowers like dry flower cards, bouquets, flower vase arrangements. They marched a step ahead to convert their technique learnt on value addition into business mode.

They prepare bouquets using speciality flowers based on the demands they receive from different government and non-

governmental organizations at Port Blair and sell each bouquet at the rate of Rs. 300/- and the material cost they spend for each bouquet is Rs 50. Hence, a net income of Rs 250/ is earned by the SHG members by sale of each bouquet.

Plate 22 : Value added products prepared by SHG members for sale

Schedule Tribe Component

Physical Output

S. No.	Description	Unit	Achievements
1	Training for farmers in horticulture crop production	No. of Training	1
		No. of Farmers	57
2	Distribution of planting material/ seed of horticultural crops	No. of plants/ cuttings	970 (Vegetable saplings and coconut seedlings)
		No. of beneficiaries	93
		Seed (kg)	0.35 (0.35 kg of bacterial wilt resistant brinjal varieties (CARI Brinjal 1 and CARI Brinjal 2))
		No. of beneficiaries	20
3	Distribution of agricultural inputs like pesticides, fungicides, fertilizers, traps and small farm implements, etc.	Others	200 (200 kg of CIARI Bio-consortia)
		No. of beneficiaries	240
4	Promotion of kitchen garden	Number	5
		No. of beneficiaries	5

Distributed vegetable seed kit (150 Numbers) to the Ongi and Great Andamanees through Tribal welfare, Andaman and Nicobar Administration on 28.07.2021 and tribal farmers at Car Nicobar on 07th Sept.,2021 and under AICRP-VC TSP programme for developing the nutritional kitchen garden through improved vegetable variety cultivation.

Plate 23: Distribution of CIARI Bio-consortia among the farmers of Nicobar

Plate 24: Distribution of CIARI Bio-consortia among the farmers of Nicobar

Plate 25: Demonstration of CIARI Bio-consortia application in FYM

Plate 26: Distribution of CIARI Brinjal seeds among the farmers of Car Nicobar

Plate 27: Distribution of CIARI Brinjal seeds among the farmers of Car Nicobar

Plate 28 : Demonstration of CIARI Bio-consortia application in FYM

Important events held

"Har Med Par Ped" in Commemoration of ICAR's Foundation Day Celebrated

ICAR- Central Island Agricultural Research Institute, Port Blair celebrated on 93rd ICAR's Foundation Day on 16th July, 2021 by conducting a "Campaign on mass tree planting and awareness programme on the theme "***Har Med Par Ped"***. Director expressed his happiness on the conduct of the Foundation day of ICAR which is the largest Institute in the National Agricultural Research System providing technological support in Research, Development, Extension and Policy benefitting the farming community and the youth of our Nation. He also highlighted on the role of Central Island Agricultural Research Institute, Port Blair in providing technological backstopping in Agri-hort-fish-animal husbandry for enabling doubling the farmers income for decent livelihood with collaboration of A&N Administration, in the line of initiatives of GoI.

Mass planting of fruit bearing trees was done on boundaries/ bunds and off the farm land, Institutional premises (Garacharma Research complex, horticulture and Bloomsdale farm), Krishi Vigyan Kendra South Andaman, North & Middle Andaman and Nicobar district beside, Regional Station, Minicoy, Lakshadweep with the participation of staff and farmers representative. Around 650 plants comprising of endemic plants like Andaman Kokum, Andaman KauPhal, *Artocarpus peduncularis* (Wild jackfruit), *Garcinia celebica* (Nicobar Mangosteen), orange kauphal-rare, besides banana, aonla, guava, khattaphal, bilimbi, west indian cherry, sapota, bread fruit, bread nut, gajapippali, acid lime, neem, moringa, subabul, Karanj, sea mahua and bamboo were planted to mark the occasion with complete zeal and enthusiasm to aid GO GREEN initiatives benefitting the tropical Island Ecosystem.

Plate 29: Tree plantation by Director, ICAR-CIARI

Chief Secretary, A & N Administration, Shri. Jitendra Narain, IAS visited ICAR-CIARI, Port Blair on 7th August 2021

The Chief Secretary, A & N Administration, Shri. Jitendra Narain, IAS visited ICAR-CIARI, Port Blair on 7th August 2021. Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI, Port Blair, welcomed the Chief Secretary and briefed about the ongoing research programme and technologies developed by the institutes. During his visit he interacted with the Scientists of the ICAR-CIARI and suggested to carry forward vision to make this island as Garden of Eden by 2047 under the mission mode programme of Plant vegetables, fruits, flowers, community garden and save seeds campaign. Chief Secretary visited the experimental and demonstration blocks of heliconia, alpinia, other exotic flower block, spice crops, dragon fruit cultivation, modern pig farm, integrated farming system model for hilly land, nursery for underutilized fruit and spice crop, microplot facility for salinity resistance rice research at Garacharma farm. Later he visited World Coconut Germplasm Centre, mixed cropping system model, spice plantation block at Sippighat farm.

Chief Secretary suggested the Director, ICAR-CIARI to develop the Garacharma farm and Sippighat farm as agro-eco-tourist point in joint venture with Information Publicity and Tourism Department, A & N Administration. He assured full cooperation in providing the required infrastructure facilities *viz*. footpath, Nicobari hut, cafeteria, sale counter, sitting benches etc in the eco-tourism points. He insisted that each and every inch of the land should be properly utilized for planting trees, vegetables, fruits, flowers to make the island self-sufficiency and to explore for export potential. He suggested labeling of important trees species with brief description for the interest of the visitors and tourist. For better coordinating approach, he mentioned that ICAR CIARI and A&N Administration should meet at least once in a week to discuss and follow up the activities of the mission of making the islands as Garden of Eden. ICAR-CIARI should produce planting materials such as drumstick, jackfruit, papaya, banana, bael and other potential crops with technological backings to support the vision 2047 which will be purchased by A&N Administration. He also suggested to provide popular article in the "The Daily Telegrams" on suitable and potential crops for cultivation in the islands with package of practices. As a master trainer, ICAR CIARI should train the staff of Agriculture Department with the latest technologies and developments. He appreciated and lauded the efforts of the ICAR-CIARI and suggested to develop the World Coconut Germplasm centre as the agro-eco-tourism point for nature walk. He suggested to name the point as "Tour of CIARI Spice Garden". He also named the mangrove view points as Eaknath View Points and advised to set up sale point for spice, fruit, planting materials, local cafeteria with some organic/alkaline/veggie juice and also lecture cum demonstration for tourist as well as students.

Plate 30: The Chief Secretary, A & N Administration, Shri. JitendraNarain, IAS visited CIARI

Midterm Review Meeting of Institute Research Council

The midterm review meeting for Institute funded projects was held during 27th to 29thSeptember, 2021 at Dr. N.T. Singh Conference Hall under the Chairmanship of Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI, Port Blair. All the scientists of the Institute have attended the meeting and presented the progress of ongoing projects wherein a total of 34 ongoing projects and one new project was discussed and reviewed during the meeting.

Plate 31 :IRC – 2021, Midterm review meeting

Celebration

Independence Day

75th Independence of India was celebrated in the institute with high spirits and fervour. Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI unfurled the National flag on the occasion of Independence Day and thereafter addressed the staff members of the CIARI. In his address, he applauded the hard work, dedication and devotion of all the staff members of the Institute in accomplishing the targets set for research, development and extension activities. Independence Day was also celebrated in all KVK's and Regional Station at Minicoy, Lakshadweep.

Plate 32: Independence Day celebration

Human Resource Development

Live / Campus interview in Doordarshan:

On 19.08.2021, launched the weekly Live / Campus Interview Series in Doordarshan involving Scientists of CIARI on the theme "Doubling Farmers' Income through Agricultural and Allied Technologies" to be telecasted every Thursday. Dr. E. B. Chakurkar, Director, CIARI gave the inaugural live interview on the topic "Agro-ecotourism: A boon for Island Economy" Doordarshan

Trainings/ /Demonstration/Awareness/Distribution/ Interaction conducted

Training :

- Thirteen days training programme on "Cultivation and value addition of cut flowers for entrepreneurship development in Andaman and Nicobar Islands" from 3-17 July, 2021, wherein 20 woman SHG members participated

- Online training program on "Cinnamon intercropping in coconut" conducted by CPCRI, Kasaragod in collaboration with DASD, Kozhikode on 23rd September, 2021 in which 20 farmers from different parts of Andaman Island attended the training programme.

- Three days training programme on 'Nursery management of horticultural crops' was organized under NABARD Urban Horticulture project from 23rd – 25th September, 2021. Quality planting material production is one of the commercial agricultural activities, which requires scientific knowledge and skill about propagation techniques, protected structures etc. The programme aimed at imparting this skill to the island youth by providing hands on training. A total of 23 female farmers attended.

Plate 33: Training programme on 'Nursery management of horticultural crops'

Demonstration:

"Cultivation of spices as profitable intercrops" was conducted on 18th Sept., 2021, wherein 10 self-help group members were participated.

Awareness

- An awareness programme on the National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) was conducted at Manglutan, South Andaman on 28th August, 2021 in which a total of 19 farmers have participated.
- On the occasion of World Coconut Day-2021, an awareness programme on 'Plantation crops based cropping systems for higher profits' was conducted on 2nd September,2021 at ICAR-CIARI under the All India Coordinated Research Project on Palms Project, in which 3 male and 11 female farmers participated.
- The ICAR- KrishiVigyan Kendra (KVK) in association with Division of Animal Science, ICAR- CIARI, Port Blair organized one awareness-cum-critical inputs distribution programme on Pig at the AICRP on Pig unit of CIARI, Port Blair, under TDC- National Innovation in Climate Resilient Agriculture (NICRA). Dr. Eaknath B. Chakurkar, Director, ICAR-Central Island Agricultural Research Institute, Port Blair encouraged the farmers to adopt pig farming for income generation and nutritional security and also briefed about the scope and importance of pig farming. A total of 15 pigs were distributed. Date

Plate 34 : Distribution of pig

Interaction

Farmers Scientists interface and screened live telecast of Hon'ble Prime Minister's interaction with innovative farmers

- Central Island Agricultural Research Institute along with three ICAR-Krishi Vigyan Kendra organized screening of live telecast of Hon'ble Prime Minister, Shri. Narendra Modiji's address to farmers & scientists of our country and launch mass awareness campaign for large scale dissemination of climate resilient technologies & methods on 28th September, 2021. During the programme, Hon'ble Prime Minister, interacted with five innovative farmers from different parts of the country and dedicated 35 new climate resilient crop varieties along with ICAR-National Institute of Biotic Stress Management, Raipur, Chhattisgarh to the nation. Earlier, Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI, Port Blair presided over the off-line Farmers-Scientist Interaction on climate adaptation and mitigation at ICAR-

CIARI, Port Blair. He explained the farming community about various climate resilient practices and methods developed by ICAR-CIARI, Port Blair and are suitable to the agro climatic conditions of these fragile island ecosystem. A film show on Climate Resilient agricultural practices adopted under "National Innovation on Climate Resilient Agriculture" project implemented by ICAR-KVK, Port Blair was screened. Similar programmes were also conducted at ICAR-KVK, Nicobar and Nimbudera. A total of 166 farmers from Andaman & Nicobar Islands participated in the programme.

Plate 35 : Farmers-scientists interface and lives streaming of PM interface meeting with farmers

Bharat Ka Amrut Mahotsav

Webinar (Live streamed in YouTube):

- On 31.07.2021, Dr. T.P. Swarnam, Pr. Scientist (Agronomy), Division of Natural Resource Management delivered webinar on "Integrated farming System for enhancing farm production" wherein 47 stakeholders participated.

- **'National fish farmers day' celebrated by** ICAR-Central Island Agricultural Research Institute (CIARI), Port Blair on 10th July 2021. A virtual webinar was organized to commemorate the special occasion and to greet the fish farmers across the archipelago for their invaluable contribution in providing food security and nutrition to the Island communities. A total of 37 participants including the fish farmers and other stakeholders have participated in the virtual event

Field Day

- A Field day was organized on "Mini feed mill for preparation of low cost balanced feed for rural poultry" on 17th July, 2021. It was organized to help rural farmers to produce their own poultry feed with locally available feed ingredients to reduce the feed cost. A total of 13 farmers including 8 farm women and youths attended the programme.

Plate 36: Demonstration of mini feed mill for preparation of low cost balanced feed

- Scientists –farmers' interaction meet was held on 22nd July, 2021 at Shoal bay. It is noteworthy to mention that community based mini incubator has been established at farmer's field, Shoal bay under Biotech kisan hub. During the meeting, Director and the team visited the mini incubator facility and also distributed chicks and also vegetables seeds to the beneficiaries. A total of 18 farmers attended the programme.

Plate : 37 : Distributed chicks during Scientists –farmers interaction

- Organized demonstration on “Speciality flower cultivation for entrepreneurship opportunities in Bay Islands” on 14th July, 2021. The demonstration of speciality flowers like heliconia, calatheas, torch ginger and red ginger were showcased and detailed to women self help group members. A total of 11 women farmers attended the programme.

Plate 38: Demonstration of specialty flowers

KisanGosthi

- Kisan Gosthi was organized on the occasion of National Programme on “Food and Nutrition for Farmers” as a part of Azadi Ka Amrit Mahotsav, at KVKs of A& N Islands & Regional Station, Minicoy on 26th August, 2021. A live streaming of message from Shri. Narendra Singh Tomar, Hon’ble Minister of Agriculture and Famers Welfare, GOI and other Dignitaries were done. A total of 51 farmers and farm women from different cluster of villages of South Andaman attended the programme. Similar functions were conducted at KVK- Nimbudera , KVK-Nicobar and Regional Station, Minicoy wherein a total of 32, 15, & 21 farmers attended respectively.

- Farmers’ participatory training on application of “Biotechnological tools in goat and rural poultry” was conducted at livestock farm complex, ICAR-CIARI from 31st August to 04th September, 2021. A total of 62 farmers including 50 women farmers attended the programme from different villages of South Andaman districts.

- Live streaming of mega event “Nutri-Cereals Multi-stakeholders Mega Convention 3.0”organized on 17th September 2021.This event was a curtain raiser for series of events to be organized with theme: Run- up for “International Year of Millets (IYOM) 2023”. Forty girl students and 96 women farmers assembled from different cluster of villages of South Andaman In the concluding session Director CIARI distributed fruit saplings (133) and vegetable seed kits(171 nos.) to the farmers and also planted fruit bearing saplings at KVK Instructional Farm and spices saplings at Horticulture farm of CIARI by the participating farmers following the principles of “ learning by doing and teaching by doing”.

Plate 39:Nutri-Cereals Multi-stakeholders Mega Convention 3.0 at KVK, Sippighat

Training /Demonstration

- A hands-on training programme for pig farmers on the topic "Scientific Castration and Mitigation of Iron Deficient Anaemia in Piglets" was organized from 7th -11th September, 2021. A total of 19 farmers from different villages of South Andaman participated in the training programme and benefitted. During the five days training programme, scientists from ICAR-CIARI covered different topics related to profitable pig farming in Andaman and Nicobar islands. In-house demonstration on scientific castration in piglets and their management were shown to the participants. As part of the programme, to empower the pig farmers, a total of 17 piglets were distributed among the farmers. This was followed by a field level demonstration on 'Vaccination against classical swine fever' and 'scientific castration of piglets' at Indiranagar village of South Andaman by a Scientific team including Dr. Debasis Bhattacharya, Dr. Jai Sunder, Dr. Arun Kumar De and Dr. Perumal P. A total of 25 pigs were vaccinated against classical swine fever disease and 2 male piglets were castrated at the farmers' field.

Plate 40: Field day on mitigation of Iron deficient anaemia in Piglets

- A demonstration programme on Cultivation of spices as profitable intercrops was organized under All India Coordinated Research Project on Palms Project on 18th September, 2021. A total of 15 farmers attended the programme.

Commercialization of Technology

Licensing of "Dweep HanGreens" to island entrepreneur

Dweep HanGreens is a structure developed for hanging cultivation of locally popular Burmese coriander (*Eryngium foetidum*) in urban areas. The structure facilitates cultivation of this herb in urban spaces for household consumption apart from providing aesthetic appeal to the area. To popularize this technology, ICAR-CIARI, Port Blair inked a MoU with Mr. Nishant Naskar, an entrepreneur from Swaraj Dweep, South Andaman on September 18, 2021. Through this MoU, the firm would fabricate the structure for sale to the interested stakeholders.

Plate 41: Signing of MoU for commercialization of "Dweep HanGreens" to island entrepreneur

Publications

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Book chapter:

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Participation in national webinar/ conferences/ workshop/training/ group meeting

Webinar

- Pooja Bohra attended National webinar on "Sustainable Integrated Cropping and Farming system models with special reference to banana for enhanced income of farmers" organized by ICAR-NRC for Banana, Trichy on 7thJuly, 2021.

- B. Augustine Jerard has participated in the virtual Brainstorming on Invasive whitefly complex on plantation crops: technical knowledge and technological interventions organized on 17th July 2021 organized by ICAR-IIOPR, Pedavegi and ICAR-CPCRI, Kasaragod.

- K. Abirami and V. Baskaran attended lecture on "Professional service functions (Training, consultancy, contract research and contract services) – An introduction, rules and guidelines by Dr. Gopal Ramdas Mahajan, Scientist, CCARI, Goa on 21st August, 2021.

- K. Abirami and V. Baskaran attended A.B.Joshi memorial lecture on " farmers' varieties, grassroot innovations and the emerging role of global gene banks" on 27th August, 2021 organized by NBPGR, New Delhi**.**

- V. Baskaran on "Waste to wealth - Adding value to crop residues on 31st August, 2021 organized by DFR, Pune.

- Dr. Gladston and Mrs. Ajina webinar on microalagal cultural production for aquaculture hatcheries on 11th September 2021 conducted by Rainbow analytics.

- Dr. B. Augustine Jerard, has participated in the webinar on Genetic molecular markers and their deployment in public sector plant breeding programmes: Challenges and opportunities organized by ICAR-NBPGR on 15th September, 2021.

- Dr. Gladston Y and Mrs. Ajina S.M on Fish trade and marketing on 18th to 19th September, 2021 organized by KUFOS, Kochi.

- Ms. Deepitha R P and Mrs. Sreepriya Prakasanon "Fish Processing and Business Opportunities" organised by PMFME.

Conference

- All the scientists of Fisheries Science Division attended 1st International Conference on "Paradigm Shift In Global Business Ecosystem – Post Covid – 19 Perspectives" on 09th, 10th&11thSeptember, 2021 organized by KUFOS, Kochi.

- B. Augustine Jerardand K. Abirami – Participated in the National Conference on "Oil Palm - A right choice towards self-sufficiency in edible oil production" on 06th September, 2021 organized by ICAR- IIOPR, Pedavegi.

Workshop

- Dr. Jai Sunder, attended the virtual training workshop for vigilance officer of ICAR from 16 to 18th August, 2021 conducted by ICAR-NAARM

Training

- Dr. Ajit A. Waman attended fourteen days virtual training programme on "Plant Genetic Resources Management and Utilization" organized by ICAR-NBPGR, New Delhi from July, 19th to 1stAugust, 2021.

- Dr. Pooja Bohra attended virtual training programme on "Packaging Standards for Fruits and Vegetables" organized by Indian Institute of Food Processing Technology, Thanjavur on 31stAugust,2021.

Group Meeting

- B. Augustine Jerard, has participated in the virtual Annual Group Meeting of AICRP Vegetable crops organized by ICAR-IIVR, Varanasi from 7th to 9th September,2021.

Other information

- Dr. K. Saravanan has served as the peer reviewer for Fish Physiology and Biochemistry Journal (Springer).

- A total of 395 kg of carp feed comprising of carp grower, starter and control feeds were prepared for the experimental trial and sale purposes.

Appointments/ promotion/ transfer/ retirement

Promotion

- Smt. Ashima Saha, Assistant to Assistant Administrative Officer on 23rd July, 2021.

- Smt. Rina Saha, Jr. Stenographer to Personal Assistant on 23rd July, 2021.

- Smt. Sheela Pal, SSS to LDC on 3rd August, 2021.

- Shri A Raja Rao, TSM to SSS on 23rd August, 2021.

- Shri Y. Vijaya Rao, TSM to SSS on 23rd August, 2021.

- Shri Lalsai Ram, TSM to SSS on 23rd August, 2021.

- Shri Peter Soreng, TSM to SSS on 23rd August, 2021.

- Shri B.V.B. Swamy, TSM to SSS on 23rd August, 2021.

- Smt. Florence Toppo, Personal Asstt. to Personal Secretary on 24th August, 2021.

Transfer

- Shri Amit Kumar Srivastava, ACTO transferred to ICAR-Central Research Institute for Dryland Agriculture, Hyderabad on 30th August, 2021.

- Dr. Shardul Vikram Lal, SMS(Animal Sci.) transferred to ICAR-IVRI, Bareilly on 20thSept., 2021.

- Mrs. Shannon N. Sangma, Scientist transferred to ICAR-IARI, Barhi, Gauria, Karma, Jharkhand on 28th Sept., 2021.

Retirement

- Smt. Archana Sarma, Technical Officer on 31st August, 2021
- Shri Ujwal Toppo, SSS on 30th Sept., 2021
- Shr K. Gopi, SSS on 30th Sept., 2021

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